Roche

CUSTOMBIOTECH

Custom Biotech Catalog 14th Edition

Expertise You Can Trust

Your Roche Custom Biotech Customer Service

Europe, Middle East, Africa, and Latin America
Roche Diagnostics Deutschland GmbH
Sandhofer Straße 116
68305 Mannheim, Germany
Phone +49 621 759 8580
Fax +49 621 759 8610
mannheim.custombiotech@roche.com

United States
Roche Diagnostics Corporation
Roche Custom Biotech
9115 Hague Road
P.O. Box 50414
Indianapolis, IN 46250-0414, USA
Phone +1 800 428 5433, ext. 14649 (toll-free)
Fax +1 317 521 4065
custombiotech.ussales@roche.com

Canada
Roche Diagnostics
201, Boulevard Armand-Frappier
HV 4A2 Laval, Québec, Canada
Phone +1 450 686 7050
Fax +1 450 686 7012
custombiotech.can@roche.com

Japan
Roche Diagnostics K.K.
Roche Custom Biotech
6-1, Shiba 2-chome
Minato-ku, Tokyo 105-0014, Japan
Phone +81 3 5443 5285
Fax +81 3 5443 7934
japan.custombiotech@roche.com

Asia Pacific
Roche Diagnostics Asia Pacific Pte. Ltd.
Regional Sales and Market Development
298 Tiong Bahru Road
16-01/06 Central Plaza
Singapore, 168730
Phone +65 6371 6638
Fax +65 6371 6601
apac.custombiotech@roche.com

custombiotech.roche.com

Service and Support

Here at Roche Custom Biotech, we make it our constant goal to provide you with close business-to-business collaboration, strict confidentiality, and a strong scientific relationship throughout your products development cycle. This catalog is the first link in a worldwide chain of contact and support we provide for all our customers, whatever your field: Diagnostics, Life Sciences, Pharma Biotech, and beyond.

Need something different?

In addition to the products in this catalog, we can also specifically modify existing products and provide consultancy on the development of completely new items. We offer customization and contract manufacturing in nearly all fields of our portfolio (including OEM of our high-quality IVD reagents), at any scale or production stage. Whether you require raw materials, labeled components, or finished kits, our contract manufacturing service will deliver according to your specifications.

We're here for you.

For quick and easy ordering, your local Roche Custom Biotech consultant is part of a dedicated and responsive order management team.
If you have specific questions or technical support inquiries, rely on our highly trained Key Account Managers to be your dedicated contact at any stage of the process. See this catalog's back cover for contact details.

Discover our scope, service, and support.

This catalog is only the beginning of our commitment to maximizing the efficiency, quality, and profitability of your project.
Thank you for choosing Roche!

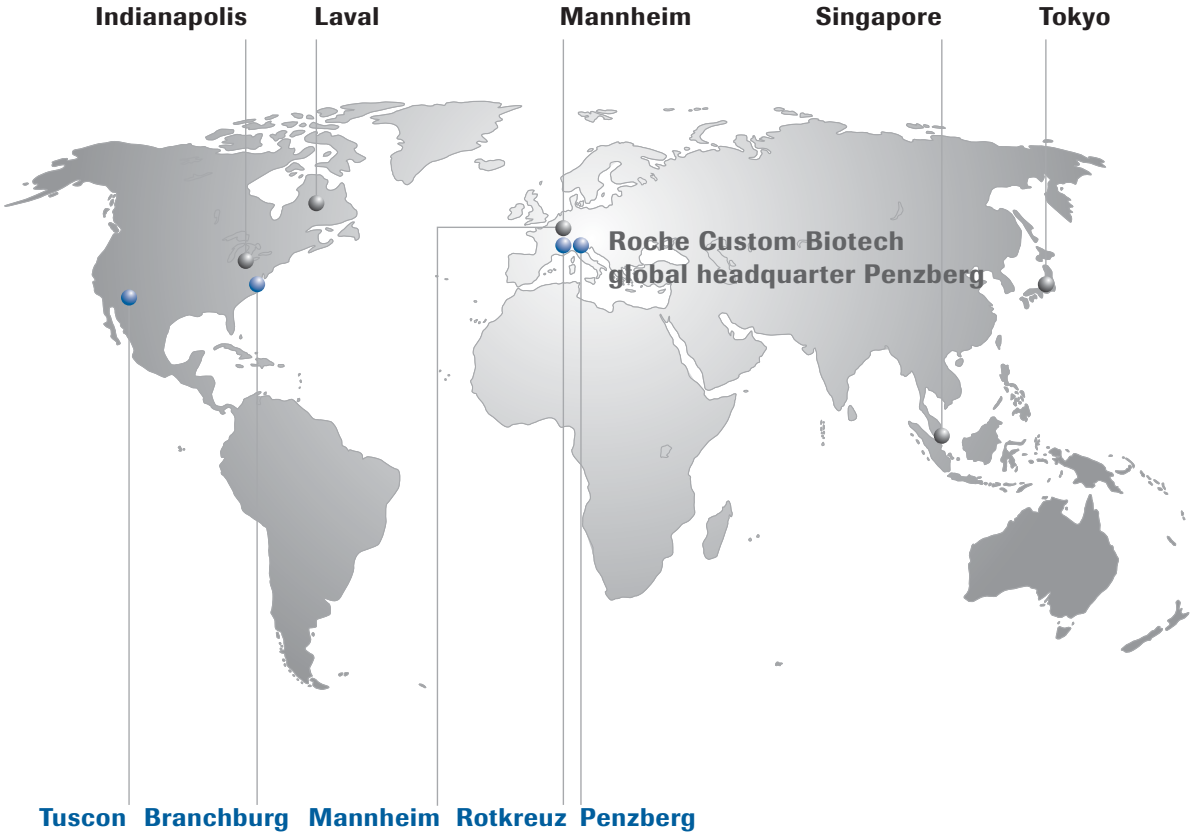
Visit us online at custombiotech.roche.com

- Explore Roche products and services.
- Find your local Roche representative.
- Download product literature.
- Obtain comprehensive information on products and applications.
- Access MSDS, pack inserts, certificates of analysis, publications, and more.
- Register to receive product updates and special offers.

The Roche Custom Biotech Team –
Your Gateway to the Worldwide Roche Network

The Key Account Manager is the key interface between your company and Roche, accessing products and providing expertise to bring you the best.
The Logistics Specialist maintains and monitors your secure supply.
The Technical Specialist provides product technical support.
The Global Marketing Manager provides project and product management.

Roche Custom Biotech local headquarters



Roche production facilities

Building on over 30 years of industry experience, Roche Custom Biotech uses the powerful multidisciplinary skills found in Roche facilities across the world. Our research and production complex in Penzberg, Germany, has become one of the largest biotechnology centers in Europe, and is the centerpiece of a constantly growing international corporate presence that provides solutions to over 500 major customers and partners.

1 Clinical Chemistry

2 Immunology

3 Molecular Diagnostics

4 Pharma Biotech

Appendix

1 Clinical Chemistry

Bovine Serum Albumin (BSA), Fraction V
lyophilizate

Serum albumin protein that has numerous biochemical applications.

Application
Use Bovine Serum Albumin (BSA) as a buffering agent, stabilizer, standard and for blending. Bovine Serum Albumin (BSA) is also a versatile tool against non-specific solid phase interference. As blocking reagent Bovine Serum Albumin (BSA) saturates unoccupied binding sites on the solid phase. Use Bovine Serum Albumin (BSA) typically at a concentration of 0.5 to 3% within the reagent buffer.

Benefits
- Keep your diagnostic reagent free from IgG contaminants.
- Take advantage of the strongly reduced concentration of heavy metal ions, sodium and potassium.
- Rely on the proven diagnostic quality of this product.

CAS: 9048-46-8

Properties
Molecular weight: 68 kD
Bovine Serum Albumin (BSA) contains no detectable IgG.
Bovine Serum Albumin (BSA) is controlled for low molecular weight contaminants.
Bovine Serum Albumin (BSA) consists primarily of monomeric albumin.

Specification
Appearance: Slightly yellow lyophilizate
Solubility: Clear, odourless solution in water
A_{405} (against water): ≤0.200
Albumin (gel electrophoresis): ≥98%
Protein (from N according to elementary analysis) : ≥95%
pH value: 6.8-7.2
Water (K. Fischer): ≤5%
Heavy metals (as Pb): ≤0.003%
P_i: ≤0.005%
Chloride (chloride meter): ≤0.15%
Glucose (enzymatically): ≤0.05%
Glucerol (enzymatically): ≤0.005%
L-Lactate (enzymatically): ≤0.1%
Na (flame photometrically): ≤0.8%
K (flame photometrically): ≤0.015%
Li (flame photometrically): ≤0.0005%
Ca: ≤0.05%
Mg: ≤0.005%
Fe: ≤0.002%
Bioburden: ≤100 CFU/g lyophilizate
Country of origin: New Zealand, USA
Stability: At +2 to +8°C within specification range for 24 months. Store dry.
Remarks:
Official veterinary certificate of health of the donor animals is available.
Official certificate of the deactivation of animal material including the method (acid treatment at pH 5 for 3 hours) is available.

Cat. No.	Pack Size
10 738 328 103	custom fill

Will be supplied as "Albumin, Fraction V from Bovine Serum". Unit of Measure is "kg".
For further processing only.

Bovine Serum Albumin (BSA), Fraction V
fatty acids ≤0.2 mg/g, lyophilizate

Highly purified serum albumin protein that has numerous biochemical applications.

Application
Use Bovine Serum Albumin (BSA) as a buffering agent, stabilizer, standard and for blending. Bovine Serum Albumin (BSA) is also a versatile tool against non-specific solid phase interference. As blocking reagent Bovine Serum Albumin (BSA)saturates unoccupied binding sites on the solid phase. Use Bovine Serum Albumin (BSA) typically at a concentration of 0.5 to 3% within the reagent buffer.

Benefits
- Keep your diagnostic reagent free from IgG contaminants.
- Take advantage of the strongly reduced concentration of fatty acids
- Rely on the proven diagnostic quality of this product.

CAS: 9048-46-8

Properties
Molecular weight: 68 kD
Bovine Serum Albumin (BSA) contains no detectable IgG.
Bovine Serum Albumin (BSA) is controlled for low molecular weight contaminants.
Bovine Serum Albumin (BSA) consists primarily of monomeric albumin.

Specification
Appearance: Slightly yellow lyophilizate
Protein (from N, according to elementary analysis): ≥97%
Water (K. Fischer): ≤5%
Na (flame photometric): ≤0.5%
K (flame photometric): ≤0.01%
Fe (AAS): ≤0.001%
Cu (AAS): ≤0.002%
Fatty acids, total (GC): ≤0.2 mg/g
Triglycerides (enzymatically): Not detectable
Immunoglobulines (ELISA): Not detectable
Country of origin: USA
Stability: At +2 to +8°C within specification range for 24 months.
Remarks:
Official veterinary certificate of health of the donor animals is available.
Official certificate of the deactivation of animal material including the method (acid treatment at pH 5 for 3 hours) is available.

Cat. No.	Pack Size
10 774 111 103	custom fill

Unit of Measure is "kg".
For further processing only.

Bovine Serum Albumin (BSA), reduced sodium and potassium

lyophilizate

Serum albumin protein for tests that require a strongly reduced concentration of sodium and potassium.

Application

Use Bovine Serum Albumin (BSA) as a buffering agent, stabilizer, standard and for blending. Bovine Serum Albumin (BSA) is also a versatile tool against non-specific solid phase interference. As blocking reagent Bovine Serum Albumin (BSA) saturates unoccupied binding sites on the solid phase. Use Bovine Serum Albumin (BSA) typically at a concentration of 0.5 to 3% in the reagent buffer.

Benefits

- Keep your diagnostic reagent free from IgG contaminants.
- Take advantage of the strongly reduced concentration of sodium, and potassium.
- Rely on the proven diagnostic quality of this product.

CAS: 9048-46-8

Properties

Molecular weight: 68 kD
Bovine Serum Albumin (BSA) contains no detectable IgG.
Bovine Serum Albumin (BSA) is controlled for low molecular weight contaminants.
Bovine Serum Albumin (BSA) consists primarily of monomeric albumin.

Specification

Appearance: Yellowish lyophilizate
A_{405} (against water): ≤0.200
pH value: 4.3-5.3
Protein (Biuret): ≥80%
Water (K. Fischer): ≤5%
Na (AAS): ≤35 ppm
K (AAS) : ≤4ppm
Li (AS) : ≤50ppm
Ca (AAS): ≤500ppm
Fe (bathophenanthrolin): ≤10 ppm
Cu (bathocuproin): ≤15ppm
Heavy metals (as Pb): ≤50ppm
P_i: ≤150ppm
Bioburden: ≤100 CFU/g lyophilizate
NH_4 (enzymatically): ≤10ppm
Glucose (enzymatically): ≤0.02%
Complex creator:
Recovery of Fe: 80-120%
Recovery of Cu: 80-120%
Electrophoresis: Chromatographically homogeneous
Country of origin: Germany
Stability: At +2 to + 8°C within specification range for 36 months.
Remarks:
Official veterinary certificate of health of the donor animals is available.
Official certificate of the deactivation of animal material including the method is available.

Cat. No.	Pack Size
11 297 368 103	custom fill

Unit of Measure is "kg".
For further processing only.

Biocides

Application

Biocides are used for preservation of reagents in diagnostic kits. The concentration recommended for each biocide is based on the highest MIC (minimal inhibition concentration) value to achieve the highest effectiveness. To decrease the biocide concentration and prevent resistance of microorganisms, use different biocides in combination, according to their efficiency spectrum.
At the recommended concentrations, enzyme performance is not usually influenced. However, this should be verified empirically on a case-by-case basis.

Antimicrobial efficiency – MIC values

This table shows the biocide concentration at which the growth of microorganisms is completely prevented.

	MIC values (mg/ml)				recommended concentration (mg/ml)
	bacteria I	bacteria II	yeast	fungi	
5-Bromo-5-nitro-1.3-dioxane (BND)	0.2	0.08	0.08	0.1	0.2
2-Chloroacetamide (CAA)	>2.6	>2.6	1.3	>2.6	>2.6
2-Hydroxypyridine-N-oxide (Oxy-PYRION)	1.3	1.3	1.3	0.32	1.3
Imidazolinylurea (Germall Grade II)	1.3	>2.6	>2.6	2.6	>2.6
N-Methylisothiazolone (MIT)	0.12	0.2	>0.4	0.2	0.4
In comparison: Na-Azide	2.6	2.6	0.04	<0.02	

MIC = minimal inhibition concentration determined in dilution assays for 72 hours at +28°C

Microorganisms tested

bacteria I	bacteria II	yeast/fungi
Bacillus subtilis	*Aeromonas sp.*	*Candida albicans*
Escherichia coli	*Alcaligenes sp.*	*Rhodotorula rubra*
Pseudomonas aeruginosa	*Flavobacter sp.*	*Aspergillus oryzae*
Staphylococcus aureus	*Proteus vulgaris*	*Mucor racemosus*
Streptococcus faecalis	*Pseudomonas aeruginosa*	*Penicillium frequentans*
	Pseudomonas fluorescens	
	Pseudomonas putida	

Biocide/enzyme interactions

	AP activity (%)	biocide (mg/ml)	**POD activity (%)**	biocide (mg/ml)	**ß-Gal activity (%)**	biocide (mg/ml)	**Luciferase activity (%)**	biocide (mg/ml)
5-Bromo-5-nitro-1.3-dioxane (BND)	100	10	120	10	100	1	66	0.1
2-Chloroacetamide (CAA)	70	3	81	3	90	3	86	3
2-Hydroxypyridine-N-oxide (Oxy-PYRION)	70	3	100	3	90	1.5	30	0.75
Imidazolinylurea (Germall. Grade II)	95	3	89	3	100	3	67	3
N-Methylisothiazolone (MIT)	100	10	100	10	80	1	97	0.5
In comparison:	0.5 mg/ml NaN_3 reduces activity of POD to 70% 1.0 mg/ml NaN_3 reduces activity of POD to 58% 10.0 mg/ml NaN_3 reduces activity of POD to 8%							

Benefits

- Contain no mercury, according to the strict current quality procedures
- Not carcinogenic or mutagenic (Ames-test negative)
- Broad efficiency spectra
- Can be combined for extension of efficiency spectra
- Low MIC values
- No or minor risk of resistance of microorganisms, especially when biocides are combined
- No or minor interferences in assays
- Readily soluble in water (in recommended concentrations)
- Toxically harmless (in recommended concentrations), considerably less toxic than sodium azide
- Highly stable, long lasting efficiency
- No coloring of reagent solution
- No odor
- Applicable in liquid reagents

Remark

In the European Union: For use in medical in vitro diagnostic products only.

2-Chloroacetamide (CAA)
crystalline powder

Yeast specialized biocide used as preservative in diagnostic kits.

Application
Use 2-Chloroacetamide (CAA) as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits
- Combine 2-Chloroacetamide (CAA) with non-ionic or ionic detergents.
- Use CAA in your preferred combination iin liquid reagents to obtain the most stable reagent.

CAS: 79-07-2

Properties
Formula: C_2H_4ClNO
Molecular weight: 93.51 D
Antimicrobial effect: Highly effective against yeast, effective against bacteria and fungi.
Possible combination: Can be combined broadly; *e.g.* with N-methylisothiazolone (MIT), 2-hydroxypyridine-N-oxide (Oxy-PYRION).
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: ≥2.6 mg/ml
pH optimum: 4.0-8.0
Stability: Stable under most conditions.

Specification
Appearance: White crystalline powder
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Identity (NIR): Corresponds to reference
2-Chloroacetamide (from N; based on anhydrous substance): 98-101%
Water (K. Fischer): ≤0.5%
N (elementary analysis): 14.65-15.05%
Sulfate ash: ≤0.1%
Stability: At +15 to +25°C within specification range for 24 months. Protect from light. Keep tightly sealed.

Cat. No.	Pack Size
10 623 580 103	custom fill

Will be supplied as "2-Chloroacetamide". Unit of Measure is "g".
For further processing only.

2-Hydroxypyridine-N-oxide (Oxy-PYRION)
crystalline powder

Broad range biocide for use in diagnostic kits

Application
Use Oxy-PYRION as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits
- Combine Oxy-PYRION with non-ionic detergents or proteins.
- Use Oxy-PYRION in your preferred combination in liquid reagents to obtain the most stable system.

CAS: 13161-30-3

Properties
Formula: $C_5H_5NO_2$
Molecular weight: 111.10 D
Antimicrobial effect: Broad effect

Cat. No.	Pack Size
11 637 126 103	custom fill

Will be supplied as "Hydroxypyridinoxid, pure". Unit of Measure is "kg".
For further processing only.

Possible combination: Can be combined with other biozides.
Interferences: Production of chelates with heavy metal ions.
Toxicity: Harmless in recommended working concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: 1.3 mg/ml
pH optimum: 5.0-8.0
Stability: Stable

Specification

Appearance: White to beige, crystalline powder
Solubility: Clear, colorless solution in water
A_{405} (aqueous solution, against water): ≤0.010
Identity (NIR): Corresponds to reference
C (elementary analysis): 53.5-54.6%
2-Hydroxypyridine-n-oxide (from C): 99-101%
Water (K. Fischer): ≤0.5%
Heavy metals (as lead): ≤10 ppm
Fe (AAS): ≤10 ppm
Al (AAS): ≤10 ppm
Isopropanol (GC): ≤0.2%
Stability: At +15 to +25°C within specification range for 36 months. Protect from light.

2-Hydroxypyridine-N-oxide (Oxy-PYRION), reduced sodium

crystalline powder

Cat. No.	Pack Size
11 374 559 103	custom fill

Unit of Measure is "kg".
For further processing only.

Broad range biocide for use in diagnostic kits

Application

Use 2-Hydroxypyridine-N-oxide, reduced sodium as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits

- Combine 2-Hydroxypyridine-N-oxide, reduced sodium with non-ionic detergents or proteins.
- Use 2-Hydroxypyridine-N-oxide, reduced sodium in your preferred combination in liquid reagents to obtain the most stable system.
- Rely on the strongly reduced concentration of sodium.

CAS: 13161-30-3

Properties

Formula: $C_5H_5NO_2$
Molecular weight: 111.10 D
Antimicrobial effect: Broad effect
Possible combination: Can be combined with other biozides
Interferences: Production of chelats with heavy metal ions
Toxicity: Harmless in recommended working concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: 1.3 mg/ml
pH optimum: 5.0-8.0
Stability: Stable

Specification

Appearance: White to beige, crystalline powder
Solubility: Clear solution in water (c=1 mg/ml)
A_{405} (c=1 mg/ml water, against water) : ≤0.010
Identity (NIR): Corresponds to reference
2-Hydroxypyridine-N-oxide (from C) : 99-101%

C (elementary analysis): 53.5-54.6%
Water (K. Fischer): ≤0.5%
Heavy metals (as Pb): ≤10 ppm
Fe (AAS): ≤10 ppm
Al (AAS): ≤10 ppm
Na (AAS): ≤70 ppm
2-Propanol: ≤0.2%
Stability: At +4°C to +8°C within specification range for 12 months. Protect from light.

5-Bromo-5-Nitro-1,3-Dioxane (BND), Grade I

crystalline powder

Broad range biocide for use in diagnostic kits

Cat. No.	Pack Size
11 354 361 103	custom fill

Will be supplied as "5-Bromo-5-nitro-1.3-dioxane, Pure". Unit of Measure is "g".
For further processing only.

Application

Use BND, Grade I as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits

- Rely on the tested purity of BND Grade I.
- Combine BND with non-ionic detergents or proteins.
- Use BND in your peferred combination in liquid reagents to obtain the most stable system.
- Use BND in phosphate, Hepes or Tris buffer systems.

CAS: 30007-47-7

Properties

Formula: $C_4H_6BrNO_4$
Molecular weight: 212.0 D
Antimicrobial effect: Very effective against bacteria, yeast and fungi.
Possible combination: Can be combined broadly with other preservatives.
Effect: May oxidize thiol groups in essential enzyme systems.
Interferences: Interferes with cysteine. Reducing agents lower the preservative effectiveness.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentrations:
0.2 mg/ml, if both the risk of contamination and concentration of protein are low (>0.2%);
0.4 mg/ml, if both the risk of contamination and concentration of protein and substrate are high.
pH optimum: 5.0-7.0
Stability: Not stable at pH <+5 and temperatures >+50°C; corrosive.

Specification

Appearance: White to slightly yellowish crystalline powder
Solubility: Clear, colourless solution in ethanol (c=10 mg/ml)
A_{405} (c=10 mg/ml, ethanol) :≤0.015
Identity (NIR): Corresponds to reference
5-Bromo-5-nitro-1.3-dioxane (GC) : ≥98.0 area%
Water (K. Fischer): ≤0.5%
Impurities (GC): ≤2.0 area%
Heavy metals (as Pb): ≤10 ppm
Oxidizing substances: ≤1%
Bromine, free: Negative
Stability: At +2 to +8°C within specification range for 18 months.

5-Bromo-5-Nitro-1,3-Dioxane (BND), Grade II

crystalline powder

Broad range biocide for use in diagnostic kits

Application

Use BND, Grade II as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits

- Combine BND with non-ionic detergents or proteins.
- Use BND in your preferred combination in liquid reagents to obtain the most stable system.
- Use BND in phosphate, Hepes or Tris buffer systems.

CAS: 30007-47-7

Properties

Formula: $C_4H_6BrNO_4$
Molecular weight: 212.0 D
Antimicrobial effect: Very effective against bacteria, yeast and fungi.
Possible combination: Can be combined broadly with other preservatives.
Effect: May oxidize thiol groups in essential enzyme systems.
Interferences: Interferes with cysteine. Reducing agents lower the preservative effectiveness.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentrations:
0.2 mg/ml, if both the risk of contamination and concentration of protein are low (>0.2%);
0.4 mg/ml, if both the risk of contamination and concentration of protein and substrate are high.
pH optimum: 5.0-7.0
Stability: Not stable at pH <+5 and temperatures >+50°C; corrosive.

Specification

Appearance: White crystalline powder probably slightly yellow
Solubility: Clear, colorless solution in ethanol (c=10 mg/ml)
A_{405} (c=10 mg/ml, ethanol): ≤0.015
Identity (NIR): Corresponds to reference
HPTLC: Corresponds to reference
Water (K. Fischer): ≤0.5%
Stability: At +15 to +25°C within specification range for 24 months.

Cat. No.	Pack Size
11 697 803 103	custom fill

Will be supplied as "Brom-nitro-dioxan,pure". Unit of Measure is "kg".
For further processing only.

Germall 115
crystalline powder

Bacteria specialized biocide used as preservative in diagnostic kits.

Application
Use Germall 115 as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits
- Combine Germall 115 with non-ionic, ionic detergents or proteins.
- Use Germall 115 in your preferred combination in liquid reagents to obtain the most stable system.

CAS: 39236-46-9

Properties
Formula: $C_{11}H_{16}N_8O_8 \times H_2O$
Molecular weight: 406.31 D
Solubility: Easily soluble in water and glycerol; soluble in ethanol 40%; insoluble in ethanol 100%.
Antimicrobial effect: Only moderate effect against fungi and yeast; should be used in combination.
Possible combination: Can be combined with all biozides which do not seperate formaldehyde, especially 5-bromo-5-nitro-1,3-dioxane (BND), 2-hydroxypyridine-N-oxide (HPO) or N-methylisothiazolone (MIT).
Effect: Belongs to the "formaldehyde-depot-substances". Inactivating effect due to reactions with -COOH, $-NH_2$, -OH and -SH of all proteins.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: 2.6 mg/ml
pH optimum: 4.5-8.5
Stability: At pH 6 and heating >+60°C this product decomposes with separation of formaldehyde.

Specification
Appearance: Fine white crystalline powder
Solubility: Clear, colorless solution in water (c=1%, w/v)
pH value (c=1%, w/v): 6.0-7.5
Identity (NIR-spectrum): Corresponds to reference
Germall 115 (from N): ≥94%
Water (K. Fischer): ≤6%
HPLC: Corresponds to reference
Heavy metals (as Pb): ≤20 ppm
Reducible components (calculated as H_2O_2): ≤0.03%
Oxidizable components (calculated as O): ≤0.2%
Formaldehyde (Nash, photometrically): ≥9.0%
Stability: At +15 to +40°C within specification range for 36 months. Store dry in tightly sealed containers.

Cat. No.	Pack Size
10 235 733 103	custom fill

Will be supplied as "Imidazolidinylurea". Unit of Measure is "kg".
For further processing only.

Germall 115, reduced sodium
crystalline powder

Bacteria specialized biocide used as preservative in diagnostic kits

Application
Use Germall 115, reduced sodium as preservative in combination with other biocides to obtain the best possible antimicrobial effect in tests that require a low concentration of sodium.

Cat. No.	Pack Size
11 276 883 103	custom fill

Unit of Measure is "g".
For further processing only.

Benefits
- Take advantage of the strongly reduced concentration of sodium.
- Combine Germall 115, reduced sodium with non-ionic, ionic detergents or proteins.
- Use Germall 115, reduced sodium in your preferred combination in liquid reagents to obtain the most stable system.

CAS: 39236-46-9

Properties
Formula: $C_{11}H_{16}N_8O_8 \times H_2O$
Molecular weight: 406.31 D
Antimicrobial effect: Only moderate effect against fungi and yeast; should be used in combination.
Possible combination: Can be combined with all biozides which do not seperate formaldehyde, especially 5-bromo-5-nitro-1,3-dioxane (BND), 2-hydroxypyridine-N-oxide (HPO) or N-methylisothiazolone (MIT).
Effect: Belongs to the "formaldehyde-depot-substances". Inactivating effect due to reactions with -COOH, $-NH_2$, -OH and -SH of all proteins.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: 2.6 mg/ml
pH optimum: 4.5-8.5
Stability: At pH 6 and heating up to >+60°C this product decomposes with separation of formaldehyde.

Specification
Appearance: White, crystalline powder
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml, water): 2.8-3.2
Identity (NIR-spectrum): Corresponds to reference
Germall 115 (from N) : ≥94%
N (elementary analysis): ≥26%
Water (K. Fischer): ≤5%
HPTLC: Corresponds to reference
Heavy metals (as Pb): ≤20 ppm
Na (AES): ≤250 ppm
Reducing substances (as O): ≤0.5%
Oxidizing substances: ≤0.03%
Stability: At +2 to +8°C within specification range for 36 months.

Micr-O-protect
solution

Very effective broad range biocide mix for use in diagnostic kits.

Application
Use Micr-o-protect as effective preservative in reagents, containing buffers, detergents, enzymes and other proteins.

Benefits
- Rely on the highly efficient ready-to-use biozide mix that can be used in most used organic or inorganic buffer systems.
- Combine Micr-O-protect with non-ionic or ionic detergents or proteins.
- Use Micr-O-protect in your preferred combination in liquid reagents to obtain the most stable system.

CAS: 30007-47-7 and 2682-20-4

Cat. No.	Pack Size
11 587 056 103	500 ml

Will be supplied as "Micr-o-protect Biocide Mix". Unit of Measure is "l".
For further processing only.

Properties

Antimicrobial effect: Due to the compatibility of both biocides used, the preparation is extraordinarily efficient at low working concentrations against pro- and eukaryotic microorganisms. Moreover, the combination of both substances provides a higher degree of protection, because development of resistance is prevented.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentration: 0.1-0.4% (v/v)
pH Optimum: 5.0-7.5
Stability: Stability is lowered at pH >8.5 or <5, at temperatures >+40°C,in the presence of reducing and oxidizing substances and in the presence of strong nucleophilic substances.
Compatibility: Micr-o-protect is well compatible with detergents, all commonly used organic and inorganic buffers and proteins.

Specification

Appearance: Clear, colorless to yellow solution
Bromonitrodioxane (GC): ≥98.0 area%
N-Methylisothiazolon (GC): ≥99.0 area%
Thin layer chromatography (TLC): Corresponds to reference
Stability: At +2 to +8°C within specification range for 24 months.

N-Methylisothiazolone (MIT)

crystalline powder

Broad range biocide for use in diagnostic kits

Cat. No.	Pack Size
11 085 905 103	custom fill

Will be supplied as "N-Methylisothiazolon-HCl". Unit of Measure is "kg".
For further processing only.

Application

Use MIT as preservative in combination with other biocides to obtain the best possible antimicrobial effect.

Benefits

- Combine MIT with non-ionic or ionic detergents or proteins.
- Use MIT in your favorite combination in liquid reagents to get the most stable system.
- Use MIT in potassium phosphate, Hepes or Tris buffer systems.

CAS: 2682-20-4

Properties

Formula: C_4H_6NOSCl
Nomenclature: 2-methyl-3(2 H)-isothiazolone-hydrochloride
Molecular weight: 151.62 D (MIT: 115.12 D)
Antimicrobial effect: Highly effective against bacteria, yeast and fungi.
Possible combination: Can be well combined with all preservatives. Combination with preservatives that have a good effect against fungi (*e.g.*, 5-bromo-5-nitro-1,3-dioxan (BND), 2-hydroxypyridine-N-oxide (HPO)) results in a very broad spectrum of effectiveness.
Effect: Thought to react with $-NH_2$ and -SH groups of all proteins.
Interferences: Probably possible with amines and sulfides.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentrations:
0.4 mg/ml, if both risk of contamination and concentration of protein are low (<0.2%);
1.0 mg/ml, if both risk of contamination and concentration are high.
pH optimum: 4.0-7.0
Stability: Decreases at pH >8.5 and >+50°C; no loss of activity when heated up to +100°C for a short period of time.

Specification

Appearance: White to light beige crystalline powder
Solubility: Clear, colorless solution in water (c=10 mg/ml), free from fuzz
A_{405} (10 mg/ml water, against water): ≤0.025
Melting range (Büchi): +160 to +180°C
Identity (NIR): Corresponds to reference
N-Methylisothiazolone (GC): ≥99 area%
Water (K. Fischer): ≤0.5%
Impurities (GC): ≤1 area%
Heavy metals (as Pb): ≤10 ppm
Oxidizing substances: ≤2%
Acetone (GC): ≤0.2%
2-Propanol (GC): ≤0.2%
Petrolether (GC): Beyond the limit of detection (approximatly 1%); Corresponds to reference
Elecsys® Hbs Ag: Corresponds
Stability: At +2 to +8°C within specification range for 24 months.

N-Methylisothiazolone (MIT) for potassium test

crystalline powder

Broad range biocide for use in diagnostic kits

Cat. No.	Pack Size
11 333 917 103	custom fill

Will be supplied as "N-Methylisothiazolone for Potassium Test".
Unit of Measure is "kg".
For further processing only.

Application

Use MIT for potassium test as preservative in combination with other biocides to obtain the best possible antimicrobial effect in tests that require a low concentration of potassium.

Benefits

- Take advantage of the strongly reduced concentration of potassium.
- Combine MIT with non-ionic or ionic detergents or proteins.
- Use MIT in your favorite combination in liquid reagents to get the most stable system.
- Use MIT in phosphate, Hepes or Tris buffer systems.

CAS: 2682-20-4

Properties

Formula: C_4H_6NOSCl
Nomenclature: 2-methyl-3(2 H)-isothiazolone-hydrochloride
Molecular weight: 151.62 D (MIT 115.12 D)
Antimicrobial effect: Highly effective against bacteria, yeast and fungi.
Possible combination: Can be well combined with all preservatives. Combination with preservatives that have a good effect against fungi (*e.g.*, 5-bromo-5-nitro-1,3-dioxan (BND), 2-hydroxypyridine-N-oxide (HPO)) results in a very broad spectrum of effectiveness.
Effect: Thought to react with $-NH_2$ and -SH groups of all proteins.
Interferences: Probably possible with amines and sulfides.
Toxicity: Harmless at recommended concentrations; not carcinogenic or mutagenic (Ames-test negative).
Recommended working concentrations:
0.4 mg/ml, if both risk of contamination and concentration of protein are low (<0.2%);
1.0 mg/ml, if both risk of contamination and concentration are high.
pH optimum: 4.0-7.0
Stability: Decreases at pH >8.5 and >+50°C; no loss of activity when heated up to +100°C for a short period of time.

Specification

Appearance: White to light beige crystalline powder
Solubility: Clear, colorless solution in water (c=10 mg/ml), free from fuzz
A_{405} (10 mg/ml water, against water)**:** ≤0.025
Melting range (Büchi)**:** +160 to +180°C
Identity (NIR)**:** Corresponds to reference
N-Methylisothiazolone (GC)**:** ≥99 area%
Water (K. Fischer)**:** ≤0.5%
Impurities (GC)**:** ≤1 area%
Na (AAS): ≤200 ppm
K (AAS): ≤10 ppm
Heavy metals (as Pb): ≤10 ppm
Oxidizing substances: ≤2%
Acetone (GC): ≤0.2%
2-Propanol: ≤0.2%
Petrolether (GC): Beyond the limit of detection (approximatly 1%); Corresponds to reference
Elecsys® Hbs Ag: Corresponds
Stability: At +2 to +8°C within specification range for 24 months.

Diethanolamine 85%
solution

Cat. No.	Pack Size
10 201 294 001	custom fill

Will be supplied as "Diethanolamine 85%". Unit of Measure is "kg". For further processing only.

Buffer for enzymatic assays of alkaline phosphatase.

Application
Use Diethanolamine 85% as a buffer in applications that test or use the activity of alkaline phosphatase, such as diagnostic tests for alkaline phosphatase.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 111-42-2

Properties
Formula: $C_4H_{11}O_2N$
Molecular weight: 105.14 D
Solubility: Miscible with water and ethanol
Suggested pH range: Approximately 10

Specification
Appearance: Colorless, clear liquid
Refractive index: n 20/D: 1.4575-1.4595
Density: D 20/20: 1.092-1.095
Coloration of sample (against water):
A_{405}: ≤0.043
A_{405} (10 days at +4°C): ≤0.043
A_{405} (10 days at +35°C): ≤0.051
Coloration of sample in buffer solution (against water):
A_{405}: ≤0.01
A_{405} (10 days at +4°C): ≤0.02
A_{405} (10 days at +35°C): ≤0.01
Diethanolamine ($HClO_4$ titration): 84.0-86.0%
Thin layer chromatography: Corresponds to reference
Mono-ethanolamine (TLC): ≤0.4%
Fe (calculated on Diethanolamine 100%): ≤2 ppm
Heavy metals (as Pb, calculated on Diethanolamine 100%): ≤5 ppm
Water (K. Fischer): 14.0-16.0%
Stability: At +2 to +8°C within specification range 18 months. Store dry. Protect from light. Keep in tightly sealed containers.

Glycylglycine
crystalline powder

Cat. No.	Pack Size
10 002 887 103	custom fill

Will be supplied as "Glycylglycin". Unit of Measure is "kg". For further processing only.

Zwitterionic buffer for diagnostic tests or as a substrate for γ-glutamyltransferase tests.

Application
Use Glycylglycine as a buffer in diagnostic reagents, or as a substrate in γ-glutamyltransferase tests where γ-glutamyltransferase transfers the gamma-glutamyl group of L-γ-glutamyl-3-carboxy-4-nitroanilide (Glupa-C) to glyclglycine.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 556-50-3

Properties
Formula: $C_4H_8N_2O_3$
Molecular weight: 132.1 D
Solubility: Easily soluble in water
Suggested pH range: 7.5-8.9

Specification
Appearance: White crystalline powder
pH value (c=0.35%, w/v): 5.5-6.5
Glycylglycine ($HClO_4$ titration, based on anhydrous substance): 99.0-100.5%
TLC: Corresponds to reference
A_{405} (c=10%; w/v, against water): ≤0.01%
Heavy metals (as Pb): ≤5 ppm
Water (K. Fischer): ≤0.5%
Fe: ≤10 ppm
Sulphate ash: ≤0.1%
Glycine (TLC): ≤0.2%
Contaminating amino acids (TLC): Not detectable
Microbiological test: Corresponds to specification
IR Spectrum: Corresponds to reference
Stability: At +15 to +40°C within specification range for 36 months. Store dry in tightly sealed containers.

Hepes
crystalline powder

Buffer for diagnostic tests, such as amylase test.

Application
Use Hepes as a buffer in reagents.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

Cat. No.	Pack Size
10 172 944 103	custom fill

Will be supplied as "Hepes". Unit of Measure is "kg".
For further processing only.

CAS: 7365-45-9

Properties
Nomenclature: 4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid
Formula: $C_8H_{18}N_2O_4S$
Molecular weight: 238.3 D
Suggested pH range: 6.8-8.2

Specification
Appearance: White crystalline powder
Solubility: Clear, colorless solution in water (c=1 mol/l)
pK value: 7.21-7.41 (+37°C); 7.45-7.65 (+20°C)
Melting range: +207 to +213°C
Hepes (alcalimetric): ≥97%
Hepes (from N): ≥97%
N (elementary analysis): ≥11.4%
Thin layer chromatography (TLC): Chromatographically homogeneous
A_{260} (against water): ≤0.050
A_{405} (against water): ≤0.030
Cl (chloride meter): ≤0.04%
Hepes mA/min (Purity check, α-amylase contamination): ≤0.1
Exclusion of skin contact and contamination with saliva: Corresponds to specification.
Stability: At +15 to +25°C within specification range for 24 months.

Imidazole
crystalline powder

Cat. No.	Pack Size
10 034 428 103	custom fill

Will be supplied as "Imidazole". Unit of Measure is "kg".
For further processing only.

Buffer for diagnostic tests, such as creatine kinase test.

Application
Use Imidazole as a buffer for diagnostic tests and other reagents, especially enzymatic reactions such as creatine kinase test.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 288-32-4

Properties
Formula: $C_3H_4N_2$
Molecular weight: 68.08 D
Suggested pH range: 6.2-7.8

Specification
Appearance: White or slightly yellowish crystallizate
Melting point: +86 to +91°C
Imidazol (titrimetric): ≥99.0%
dA_{250} - dA_{360}: ≤0.050
dA_{334}: ≤0.050
dA_{405}: ≤0.010
Stability: At +15 to +25°C within specification range for 24 months.

MES
crystallizate

Cat. No.	Pack Size
10 073 571 103	custom fill

Will be supplied as "4-Morpholineethane Sulfonic Acid (Mes)".
Unit of Measure is "kg".
For further processing only.

Buffer for a variety of diagnostic tests, such as Glucose test.

Application
Use MES as a buffer in reagents that require a pH of approximately 6.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 4432-31-9

Properties
Nomenclature: 4-Morpholineethane Sulphonic Acid
Formula: $C_6H_{13}NO_4S$
Molecular weight: 195.2 D
Suggested pH range: 5.5-6.7

Specification
Appearance: White crystallized substance
Solubility: Clear, colorless solution in water (c=50 mg/ml)
pK value: 6.2±0.2 (+25°C)
Equivalent point: 8.9±0.3
MES (alkalimetric): ≥98%
MES (from N): ≥98%
N (elementary analysis): ≥7%

A_{260}(c=10 mg/ml, neutralized): ≤0.05
Heavy metals (as Pb): ≤10 ppm
Br (chloride meter): ≤0.5%
Thin layer chromatography (TLC): Chromatographically homogeneous
Stability: At +15 to +25°C within specification range for 24 months.

Pipes
free acid

Cat. No.	Pack Size
10 239 500 103	custom fill

Will be supplied as "Pipes, Free Acid". Unit of Measure is "kg". For further processing only.

Buffer for diagnostic tests, such as cholesterol test.

Application
Use Pipes as a buffer in a variety of diagnostic tests, especially in tests for cholesterol and triglycerides.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 5625-37-6

Properties
Nomenclature: Piperazine-1,4-bis-2-ethane sulfonic acid
Formula: $C_8H_{18}N_2O_6S_2$
Molecular weight: 302.4 D
Suggested pH range: 6.1-7.5

Specification
Appearance: Colorless crystals
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pK value: 6.8±0.1
Pipes (alkalimetric): ≥98%
Pipes (from N): ≥98%
A_{260} (c=10 mg/ml water) : ≤0.05
Thin layer chromatography (TLC): Chromatographically homogeneous
Br (chloride meter): ≤0.5%
Identity (IR spectrum): Corresponds to reference
Stability: At +15 to +25°C within specification range for 24 months.

Pipes
disodium salt

Cat. No.	Pack Size
10 735 361 103	custom fill

Will be supplied as "Pipes, Sodium Salt". Unit of Measure is "kg". For further processing only.

Buffer for diagnostic tests, such as cholesterol test.

Application
Use Pipes as a buffer in a variety of diagnostic tests, especially in tests for cholesterol and triglycerides.

Benefits
- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 5625-37-6

Properties
Nomenclature: Piperazine-1,4-bis-2-ethane sulfonic acid
Formula: $C_8H_{16}N_2O_6S_2Na_2$
Molecular weight: 346.3 D

Suggested pH range: 6.1-7.5

Specification

Appearance: Colorless powder
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Pipes (from N): ≥82%
Na (flame photometric): 11-14%
Water (K. Fischer): ≤5%
N (elementary analysis) : ≥7.6%
A_{340} (c=10 mg/ml water): ≤0.01
HPTLC: Chromatographically homogeneous
Identity (IR spectrum): Corresponds to reference
Stability: At +15 to +25°C within specification range for 24 months.

Tris
crystallizate

Buffer for diagnostic tests, such as tests for aminotransferases.

Application

Use Tris as a buffer in diagnostic reagents, especially in tests for aminotransferases or γ–glutamyltransferase.

Benefits

- Rely on the proven quality of this product for the manufacturing of diagnostic tests.

CAS: 77-86-1

Properties

Nomenclature: Tris(hydroxymethyl)-amminomethane
Formula: $C_4H_{11}NO_3$
Molecular weight: 121.1 D
Suggested pH range: 7.0-9.0

Specification

Appearance: Colorless, odorless crystallizate
Solubility: Clear, colorless solution in water (c=100 mg/ml), free of fuzz
Flow properties: Passes
Melting range: +168 to +171°C
Conductivity (water, 1 µS, +25°C): ≤110 µS
pH value (c=6 mg/ml, in water): 10.0-11.0
Tris (titrimetric, based on dry weight): 99.5-100.5%
Water (K. Fischer): ≤0.2%
Sulfate ash (with concentrated H_2SO_4 at +600°C): ≤0.05%
Fe (AAS): ≤1 ppm
As (AAS): ≤1 ppm
Heavy metals (as Pb): ≤1 ppm
Reducing substances ($KMnO_4$, 0.002 mol/l): ≤3 ml/100 mg
Acetone (GC): ≤0.05%
Methanol (GC): ≤0.05%
Cl (turbidimetric test with $AgNO_3$): ≤20 ppm
Bioburden: ≤100 CFU/g
A_{300} (against water, c=100 mg/ml): ≤0.020
A_{405} (against water, c=100 mg/ml): ≤0.004
Stability: At +15 to +25°C within specification range for 24 months. Protect from light.

Cat. No.	Pack Size
10 153 265 001	custom fill

Will be supplied as "Tris-(hydroxymethyl)-aminomethane". Unit of Measure is "kg".
For further processing only.

Detergents

Application

Detergents are used in diagnostic kits:

- To enhance the solubility of test or sample compounds
- To activate enzymes such as esterases
- To reduce interference from serum lipids
- To reduce carryover effects on analyzers and facilitate dispensing processes
- To reduce non-specific binding to solid phases in immunoassays
- To pretreat samples
- To make use of possible antimicrobial effects

Properties

The choice of a specific detergent depends on the protein to be solubilized, the need of removal, toxicity data, interference with UV-VIS-absorption, interference with subsequent isoelectric focusing or ultracentrifugation.

The following table can therefore only give a first approximation for the optimal choice of a detergent.

	Ability to disperse protein aggregates	Denaturation of protein	Ease of removal
Non-ionic detergents			
n-Octyl-ß-D-glycoside	Low	No	Very easy
Polidocanol (Thesit)	Low	No	Difficult
Triton X-100	Low	No	Difficult
n-Dodecyl-ß-D-maltoside	Low	No	Difficult
Nonidet P40	Low	No	Difficult
Tween 20	Low	No	Difficult
Ionic detergents			
Cholate	Low	(no)	Very easy
Deoxycholate	High	(no)	easy
Zwitterionic detergents			
CHAPS	High	No	Very easy

Dilaurylglycerosulfate
powder

Cat. No.	Pack Size
11 827 294 103	custom fill

Will be supplied as "Dilaurylglycerosulfat". Unit of Measure is "g".
For further processing only.

Detergent for diagnostic tests.

Application
Use Dilaurylglycerosulfate as a co-emulsifier in the diagnostic test for the determination of lipase.

Benefits
- Enhance the performance of your lipase test.

CAS: 99387-94-7

Properties
Formula: $C_{27}H_{56}O_6S$
Molecular weight: 508.8 D

Specification
Appearance: White powder
C (elementary analysis): ≥57.3%
H (elementary analysis): ≥10.0%
Water (K. Fischer): ≤5%
Stability: At +2 to +8°C within specification range for 12 months.

Cholate
ionic detergent, sodium salt

Cat. No.	Pack Size
10 261 084 103	custom fill

Will be supplied as "Cholic Acid Sodium Salt". Unit of Measure is "kg".
For further processing only.

Anionic detergent for diagnostic tests.

Application
Use Cholate in diagnostic reagents, such as for the determination of cholesterol and triglycerides.

Benefits
- Enhance the solubility of your reagent.
- Reduce interferences with serum lipids or carryover effects.
- Rely on the proven diagnostic quality of this product.

CAS: 81-25-4

Properties
Formula: $C_{24}H_{39}NaO_5$
Molecular weight: 430.6 D
Detergent type: Anionic detergent
Solubility: Limited solubility in the presence of Ca^{2+}
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions as for handling of irrigating products must be taken.

Specification
Appearance: White crystalline powder
Solubility:
Clear, colorless solution in water (c=10 mg/ml)
Clear, colorless to yellowish solution in water (c=150 mg/ml, +20°C)
Identity (NIR): Corresponds to reference
Cholic acid, Na-salt (HPLC): ≥93 area%
Water (K. Fischer): ≤6%
C (elementary analysis): 62-67%
Na (flame photometric): 5.0-5.5%
Heavy metals (as Pb): ≤10 ppm

Flame coloration: Positive
A_{340} (against water): ≤0.100
A_{505} (against water): ≤0.005
A_{546} (against water): ≤0.005
A_{505} to A_{550} (against water): ≤0.025
Hydrophilic contaminants (HPLC): ≤15 area%
Lipophilic contaminants (HPLC): ≤4.0 area%
Reducing substances: ≤0.25 ml ($KMnO_4$, 0.002 mol/l, per 100 mg)
Oxidizing substances: Negative
Bioburden: ≤100 CFU/g, ≤10 moulds/g
Performance: Corresponds to specification
County of origin: USA, Australia
Stability: At +15 to +25°C within specification range for 36 months. Protect from light.

Deoxycholate
ionic detergent, sodium salt

Cat. No.	Pack Size
11 434 314 103	custom fill

Will be supplied as "Desoxycholat, Mono-NA, Crystal". Unit of Measure is "kg".
For further processing only.

Anionic detergent for diagnostic tests.

Application
Use Deoxycholate in diagnostic reagents, such as for the determination of lipase.

Benefits
- Enhance the solubility of your reagent.
- Reduce protein-protein interactions in your reagent.
- Rely on the proven diagnostic quality of this product.

CAS: 83-44-3

Properties
Formula: $C_{24}H_{39}O_4Na$
Molecular weight: 414.6 D
Detergent type: Anionic detergent
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions as for handling of irrigating products must be taken.

Specification
Appearance: White, crystalline powder
Solubility: Clear, colorless solution in water (c=50 mg/ml), free from fuzz
Deoxy cholic acid (sodium deoxycholate, HPLC): ≥83.0 area%
Hydrophilic contaminants: ≤15.0 area%
Lipophilic contaminants: ≤5.0 area%
Water (K. Fischer): ≤10.0%
Acetone (GC): ≤0.5%
Heavy metals (as Pb): ≤5 ppm
Stability: At +15 to +25°C within specification range for 36 months.

Taurodesoxycholat
sodium salt

Cat. No.	Pack Size
11 332 686 103	custom fill

Will be supplied as "Taurodesoxycholic. acid, Na, pur.". Unit of Measure is "g".
For further processing only.

Anionic detergent for diagnostic tests.

Application
Use Taurodesoxycholat in diagnostic reagents, such as for the determination of lipase.

Detergents

Ionic Detergents

Benefits

- Enhance the solubility of your reagent.
- Activate the lipase in your reagent.
- Rely on the proven diagnostic quality of this product.

CAS: 1180-95-6

Properties

Formula: $C_{26}H_{44}NO_6SNa$
Molecular weight: 521.7 D
Detergent type: Anionic detergent
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions for handling hazardous products must be used.

Specification

Appearance: White lyophilizate
Taurodesoxy cholate, Na (from C): ≥90%
Taurodesoxy cholate, Na (HPLC): ≥89 area%
C (elementary analysis): 53.9-61.0%
H (elementary analysis): 7.9-8.9%
N (elementary analysis): 2.4-3.0%
Na (flame photometric): 4.4-6.6%
Water (K. Fischer): ≤5%
Stability: At +2 to +8°C within specification range for 24 months.

n-Dodecyl-β-D-maltoside
nonionic detergent, powder

Cat. No.	Pack Size
10 808 342 103	custom fill

Will be supplied as "n-Dodecyl-b-D-maltoside". Unit of Measure is "g".
For further processing only.

Noninoic detergent for diagnostic tests

Application
Use n-Dodecyl-β-D-maltoside as a mild, nondenaturing detergent for the solubilization proteins, especially antibodies.

Benefits
- Obtain very gentle conditions that stabilize and preserve your reagent activity.
- Rely on the proven diagnostic quality of this product.

CAS: 69227-93-6

Properties
Nomenclature: 1-O-n-Dodecyl-β-D-glucopyranosyl(1-4)α-D-glucopyranoside
Formula: $C_{24}H_{46}O_{11}$
Molecular weight: 510.62 D
Detergent type: Nonionic alkyl maltoside type

Specification
Appearance: White, crystalline powder
Specific rotation [α] 25/D (in MeOH): +46.0±2.0°
n-Dodecylmaltoside (from C): ≥98%
C (elementary analysis): ≥55.20%
Dodecanol (GC): ≤0.1%
Stability: At +15 to +25°C within specification range for 24 months.

n-Octyl β-D-glucoside
nonionic detergent, powder

Cat. No.	Pack Size
10 411 469 103	custom fill

Will be supplied as "n-Octylglucoside". Unit of Measure is "g".
For further processing only.

Nonionic detergent for diagnostic tests

Application
Use n-Octyl β-D-glucoside as a mild, nondenaturing detergent for the solubilization of proteins, especially antibodies. n-Octyl β-D-glucoside can be easily removed by dialysis.

Benefits
- Rely on the proven diagnostic quality of this product.
- Take advantage of the mild conditions that stabilize your valuable reagent.

CAS: 29836-26-8

Properties
Nomenclature: 1-O-Octyl-β-D-glucopyranoside
Formula: $C_{14}H_{28}O_6$
Molecular weight: 292.4 D
Detergent type: Nonionic alkyl glucoside type
pH stability: Stable in solutions above pH 6.5

Specification
Appearance: White powder
n-Octylglucoside (from C): ≥99%
C (elementary analysis): ≥56.9%
Octanol (GC): ≤0.1%
Stability: At +15 to +25°C within specification range for 36 months. Store dry.

Nonidet P40

nonionic detergent, aqueous solution

Nonionic detergent for diagnostic tests.

Application

Use the nondenaturing detergent Nonidet P40 for the solubilization of proteins, especially antibodies.

Benefits

- Rely on the low amount of peroxides and carbonyl groups.
- Stabilize your valuable reagent.

CAS: 9016-45-9

Properties

Formula: $C_{33}H_{60}O_{10}$ (n=9)
Molecular weight: 616,83 D
Detergent type: Nonionic detergent, polythylene type, nondenaturating
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions as for handling of irrigating products must be taken.

Specification

Appearance: Clear, colorless solution
Conductivity: ≤100 µS/cm
Peroxides: ≤2 ppm
Carbonyl groups (MBTHS): ≤0.02 mg/ml
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
11 333 941 103	custom fill

Will be supplied as "Nonidet P40, cleaned, Solution". Unit of Measure is "l".
For further processing only.

Polidocanol (Thesit)

Nonionic detergent for use in diagnostic reagents.

Application

Use Polidocanol in diagnostic reagents to enhance solubility, minimize interferences and reduce carryover effects.

Benefits

Rely on the proven diagnostic quality of this product.

CAS: 9002-92-0

Properties

Nomenclature: Dodecylpolyethyleneglycolether
Formula: $C_{30}H_{62}O_{10}$ (n=approximately 9)
Molecular weight: Approximately 600 D
Detergent type: Nonionic polyoxyethylene type
Handling advice: Polydocanol must be moderately heated (+40 to +50°C) and carefully homogenized by gentle stirring before dispensing.

Specification

Appearance: White, pasty, fatty substance; clear, colorless to slightly yellow liquid at approximatly +30°C
Solubility: Clear, colorless solution in water (c=100 mg/ml)
Peroxide (as H_2O_2): ≤1 ppm
Stability: At +2 to +8°C within specification range for 24 months. Keep under argon or nitrogen. Protect from light.

Cat. No.	Pack Size
10 831 620 103	custom fill

Will be supplied as "Polidocanol (PEG Monododecyl Ether)". Unit of Measure is "kg".
For further processing only.

Triton X-100
nonionic detergent, viscous liquid

Cat. No.	Pack Size
10 743 119 103	custom fill

Will be supplied as "Triton X-100, for Membrane Research". Unit of Measure is "l".
For further processing only.

Nonionic detergent for diagnostic tests.

Application
Use Triton-X 100 for the solubilization of proteins, especially antibodies.

Benefits
- Stabilize your valuable reagent
- Rely on the proven diagnostic quality of this product.

CAS: 9002-93-1

Properties
Nomenclature: Octylphenolpoly(ethyleneglycolether)n, n=10
Formula: $C_{34}H_{62}O_{11}$
Molecular weight: 647 D
Detergent type: Nonionic polyethylene type
Handling advice: Triton X-100 must be homogenized carefully before dispensing at +20 to +30°C.

Specification
Appearance: Clear, colorless liquid
Triton X-100 (GC): Corresponds to standard
Peroxide (as H_2O_2): ≤1 ppm
Stability: At +2 to +8°C within specification range for 12 months. Keep under argon or nitrogen. Protect from light. Keep tightly sealed.

Tween 20
purified, solution

Cat. No.	Pack Size
11 334 000 103	custom fill

Will be supplied as "Tween 20, gereinigt, Lsg". Unit of Measure is "l".
For further processing only.

Non-ionic detergent for diagnostic tests

Application
Use Tween 20 as non-denaturing detergent for the solubilization of proteins, especially antibodies.

Benefits
- Stabilize your valuable reagent
- Rely on the low amount of peroxides and carbonyl groups and salts in this product.

CAS: 9005-64-5

Properties
Formula: $C_{58}H_{114}O_{26}$ (for w+x+y+z=n=20)
Molecular weight: 1228 g/mol

Specification
Appearance: Clear, yellow solution
Conductivity: ≤100 µS/cm
Peroxide (as H_2O_2): ≤2 ppm
Aldehyde: ≤0.02 mg/ml
Stability: At +2 to +8°C within specification range for 24 months. Store under nitrogen. Protect from light.

CHAPS

zwitterionic detergent, crystalline powder

Cat. No.	Pack Size
10 810 681 103	custom fill

Will be supplied as "CHAPS". Unit of Measure is "kg".
For further processing only.

Zwitterionic detergent for diagnostic tests.

Application
Use CHAPS to reduce protein-protein interactions. CHAPS can be easily removed by dialysis.

Benefits
- Minimize protein-protein interactions in your reagent without denaturing the protein or enzyme.
- Rely on the proven diagnostic quality of this product.

CAS: 75621-03-3

Properties
Nomenclature: 3-[(3-Cholamidopropyl)dimethylammonio]-1-propanesulfonate
Formula: $C_{32}H_{58}N_2O_7S$
Molecular weight: 614.9 D
Detergent type: Zwitterionic detergent, nondenaturating

Specification
Appearance: White, crystalline powder
CHAPS (from N): ≥99%
N (elementary analysis): ≥4.49%
A_{260} (against water): ≤0.10
A_{280} (against water): ≤0.10
Thin layer chromatography (TLC): Chromatographically homogeneous, corresponds to reference
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Protect from light.

CHAPSO

zwitterionic detergent, crystalline powder

Cat. No.	Pack Size
11 112 392 103	custom fill

Will be supplied as "CHAPSO". Unit of Measure is "g".
For further processing only.

Zwitterionic detergent for diagnostic tests.

Application
Use CHAPSO to reduce protein-protein interactions. CHAPSO can be easily removed by dialysis.

Benefits
- Minimize protein-protein interactions in your reagent without denaturing the protein or enzyme.
- Rely on the proven diagnostic quality of this product.

CAS: 82473-24-3

Properties
Nomenclature: 3-[(3-Cholamidopropyl)dimethylammonio]-2-hydroxy-1-propansulfonate
Formula: $C_{32}H_{58}N_2O_8S$
Molecular weight: 630.9 D
Detergent type: Zwitterionic detergent, similar to CHAPS but more soluble.
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions as for handling of irrigating products must be taken.

Specification
Appearance: White crystalline powder
CHAPSO (from C): ≥95%
C (elementary analysis): ≥57.6%
Water (K. Fischer): ≤4%
HPTLC: Chromatographically homogeneous
Stability: At +2 to +8°C within specification range for 36 months.

Zwittergent 3-14
zwitterionic detergent, powder

Synthetic zwitterionic detergent for diagnostic tests.

Application
Use Zwittergent 3-14 to reduce protein-protein interactions.

Benefits
- Minimize protein-protein interactions in your reagent without denaturing the protein or enzyme.
- Rely on the proven diagnostic quality of this product.

CAS: 14933-09-6

Properties
Nomenclature: N-Tetradecyl-N,N-dimethyl-3-ammonio-1-propane-sulfonate
Formula: $C_{19}H_{41}NO_3S$
Molecular weight: 363.65 D
Detergent type: Zwitterionic detergent
Handling advice: Harmful if exposed to skin and if inhaled. Adequate precautions as for handling of irrigating products must be taken.

Specification
Appearance: White powder
UV spectrum (200-400 nm; against water): Corresponds to specification
A_{225} (against water): ≤0.500
A_{260} (against water): ≤0.150
A_{280} (against water): ≤0.150
A_{325} (against water): ≤0.100
N-Tetradecyl-N,N-dimethyl-3-ammonio-1-propane-sulfonate (from C): ≥98.0%
N-Tetradecyl-N,N-dimethyl-3-ammonio-1-propane-sulfonate (HPLC): 95.0 area%
C (elementary analysis): ≥61.40%
H (elementary analysis): ≥11.00%
N (elementary analysis): ≥3.30%
Stability: At +15 to +25°C within specification range for 36 months.

Cat. No.	Pack Size
11 112 902 103	custom fill

Will be supplied as "N-Tetradec-N,N-dimet-3-am-1-propSulfonat".
Unit of Measure is "g".
For further processing only.

Aprotinin
from bovine lung, lyophilizate

Protease inhibitor

Application
Use Aprotinin in reagents to inhibit serine proteases, such as kallikrein, plasmin, trypsin and chymotrypsin.

Benefits
- Take advantage of the excellent abilities of Aprotinin to inhibit serine proteases.
- Rely on the proven diagnostic quality of this product.

CAS: 9087-70-1

Specification
Appearance: White lyophilizate
Activity (Chromozym TRY, +25°C): ≥630 inhibitor U/mg lyophilizate
Activity (BAEE, +25°C): ≥200 inhibitor U/mg lyophilizate
Protein (Lowry): 90-100%
Electrophoresis (SDS Page): Corresponds to reference
Country of origin: USA, South Africa, New Zealand, Australia, or Uruguay, respective
Stability: At +2 to +8°C within specification range for 12 months. Store dry.
Remarks:
Official veterinary certificate of health of the donor animals is available.
Official certificate of the deactivation of animal material including the method (acid treatment at up to pH 5 for up to 5 h) is available.

Cat. No.	Pack Size
10 236 632 103	custom fill

Will be supplied as "Aprotinin from Bovine Lung". Unit of Measure is "g".
For further processing only.

Pefabloc SC (AEBSF)
4-(2-Aminoethyl)-benzenesulfonyl fluoride hydrochloride, powder

Protease inhibitor

Application
Use Pefabloc in reagents to inhibit serine proteases, such as thrombin in serum or plasma.

Benefits
- Take advantage of the excellent abilities of Pefabloc to inhibit thrombin.
- Rely on the low toxicity and enhanced stability of this product compared to PMSF or DFP.

CAS: 34284-75-8

Properties
Molecular weight: 239.5 D

Specification
Appearance: White powder
Pefabloc HCl (HPLC): ≥90 area%
Pefabloc HCl (from C): ≥95%
C (elementary analysis): ≥38.1%
H (elementary analysis): ≥4.2%
N (elementary analysis): ≥5.5%
Thin layer chromatography (TLC): Chromatographically homogeneous
Inhibition chymotrypsin: Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
11 427 393 103	custom fill

Will be supplied as "Pefabloc SC AEBSF, Hydrochloride". Unit of Measure is "g".
DRY ICE
For further processing only.

1,4-Dithiothreitol (DTT)
crystallizate

Cat. No.	Pack Size
10 197 785 103	custom fill

Will be supplied as "Dithiothreitol (DTT) Cleland's Reagent". Unit of Measure is "g".
For further processing only.

Reducing agent

Application
Use 1,4-Dithiothreitol primarily to protect free SH-groups from oxidation. Use it routinely in all work with enzymes and proteins during enzyme measurement and the characterization of proteins.

Benefits
- Rely on the higher stability of DTT in comparison to 2-mercaptoethanol in aqueous solution
- Experience more convenience and a less disagreeable odor
- Benefit from the reduced tendency to oxidize in air.

CAS: 3483-12-3

Properties
Nomenclature: Threo-1,4-dimercapto-2,3-butanediol
Formula: $C_4H_{10}O_2S_2$
Molecular weight: 154.3 D

Specification
Appearance: White to yellowish crystallizate
DTT (with Ellman's reagent): ≥97%
Thin layer chromatography: Chromatographically homogeneous, corresponds to reference
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Protect from light.

3-Hydroxy-1,2,3,4-tetrahydrobenzo[h]quinoline
crystalline powder

Cat. No.	Pack Size
10 003 174 001	custom fill

Will be supplied as "BM 32.027". Unit of Measure is "kg".
For further processing only.

Chemical for dry chemistry diagnostic tests

Application
Use 3-Hydroxy-1,2,3,4-tetrahydrobenzo[h]quinoline in dry chemistry application for the determination of urea.

Benefits
Rely on the proven diagnostic quality of this reagent.

CAS: 5423-67-6

Properties
Nomenclature: 3-Hydroxy-1,2,3,4-tetrahydrobenzo[h]quinoline
Formula: $C_{13}H_{13}NO$
Molecular weight: 199.25
Toxicity: Harmful

Specification
Appearance: White to greyish, odorless cristalline powder
Solubility: Clear, colorless solution in methanol (c=0.2%; w/v)
Melting range: +150 to +154°C
Loss on drying: ≤0.5%
Sulphate ash: ≤0.2%
3-Hydroxy-1,2,3,4-tetrahydrobenzo[h]quinoline ($HClO_4$ titration, based on dried substance): 98.0-102.0%

Biochemicals for Clinical Chemistry

Additional Biochemicals

UV / VIS spektrum:
Maximum I: 250 to 254 nm (specific absorbance ($A_{1\%/1cm}$): 988-1050)
Maximum II: 334 to 338 nm (specific absorbance ($A_{1\%/1cm}$): 286-306)
Thin layer chromatography (TLC): Corresponds to reference
IR Spectrum: Corresponds to reference
Stability: At +2 to +8°C within specification range for 24 months. Protect from light.

D-Mannitol
reduced sodium

Excipient (inactive substance) for the production of tablets or granulated material

Cat. No.	Pack Size
11 371 754 103	custom fill

Will be supplied as "D-Mannit, Na-arm". Unit of Measure is "kg". For further processing only.

Application
Use D-Mannitol as an excipient (inactive substance) to produce tablets or granulated material that contain reagents or components used in diagnostic applications.

Benefits
- Rely on the proven diagnostic quality of this product.

CAS: 69-65-8

Properties
Formula: $C_6H_{14}O_6$
Molecular weight: 182.2 D
Solubility: Slightly soluble in water and hot ethanol, of low solubility in ethanol.

Specification
Appearance: White, silky crystals or white, crystalline powder
Solubility: Clear, colorless solution in water (c=10%, w/v)
Melting range: +166°C to +168°C
Specific rotation (c=10%, w/v, calculated on dry substance): +23.0° to +25.0°
Purity (HPLC):
D-Mannit: ≥97.5 area%
Sorbit: ≤2.5 area%
Alkaline impurities (calculated as NaOH): ≤80 ppm
Acid impurities (calculated as HCl): ≤45 ppm
As: ≤1 ppm
Cl: ≤50 ppm
Fe: ≤0.1 ppm
Ni: ≤1 ppm
Reducing sugar: Corresponds to reference
Heavy metals (as Pb): ≤2 ppm
Sulphate: ≤100 ppm
Sulphate ash: ≤500 ppm
Loss on drying: ≤0.3%
Na: ≤200 ppm
Microbiological analysis: Corresponds to reference
Stability: At +15 to +25°C within specification range for 36 months. Store dry. Protect from light.

Kryptofix 221
solution

Cat. No.	Pack Size
11 183 958 103	custom fill

Will be supplied as "Kryptofix 221". Unit of Measure is "kg active ingredient".
For further processing only.

Cryptant that binds cations in aqueous solutions

Application
Use Kryptofix 221 in enzymatic tests for potassium to decrease the sodium concentration relative to potassium.

Benefits
- Selectively reduce sodium in your diagnostic reagent.
- Rely on the strongly reduced concentration of potassium and sodium.

CAS: 31364-42-8

Properties
Formula: $C_{16}H_{32}N_2O_5$
Molecular weight: 332.44 D

Specification
Appearance: Clear, yellow liquid
Solubility: Clear yellowish solution in water (c=4 mg/ml)
A_{340} (aqueous solution): ≤0.100
A_{405} (aqueous solution): ≤0.060
Identity (NIR): Corresponds to reference
^{13}C-NMR spectrum: Corresponds to masterlot
Kryptofix 221 agent (HPLC; based on masterlot): ≥75 %
Na (AES): ≤65 ppm
K (AES): ≤5 ppm
NH_3 (evolution in buffer; after 10 days at +55°C): ≤50 µmol/l
Stability: At +2 to +8°C within specification range for 12 months. Keep under nitrogen. Protect from light.

Valinomycin
crystallizate

Cat. No.	Pack Size
10 161 594 103	custom fill

Will be supplied as "Valinomycin". Unit of Measure is "g".
For further processing only.

Potassium selective ionophoric cyclodepsipeptide

Application
Use Valinomycin in diagnostic tests for potassium where it acts as an ion carrier in potassium selective electrodes.

Benefits
Rely on the proven diagnostic quality of this reagent.

CAS: 2001-95-8

Properties
Formula: $C_{54}H_{90}N_6O_{18}$
Molecular weight: 1111.4 D

Specification
Appearance: White crystallizate
Solubility: Clear, colorless solution in chloroform (c=10 mg/ml)
Melting point: ≥+183°C
Specific rotation (in chloroform):: +30.0±2.0°
Valinomycin (from N): ≥94%
Valinomycin (HPLC): ≥85.0 area%
C (elementary analysis) : ≥54.86%
H (elementary analysis) : >=7.67%

Biochemicals for Clinical Chemistry

Additional Biochemicals

N (elementary analysis): ≥7.10%
Thin layer chromatography (TLC):
a) UV: Homogeneous
b) to spray with H_2SO_4 (1%); to vaporize with Iodine: Corresponds to reference
Stability: At +2 to +8°C within specification range for 36 months. Store in safety zone dedicated to poisonous agents.

Acetyl-Coenzyme A
trisodium salt

Cofactor for carnitine acetyl transferase

Application
Use Acetyl-Coenzyme A for the determination of L-carnitine.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 72-89-9

Properties
Formula: $C_{23}H_{35}N_7O_{17}P_3SNa_3$
Molecular weight: 875.5 D (Acetyl-CoA: 809.6 D)

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Acetyl-CoA (enzymatically): 78-97%
Acetyl-CoA (A_{260}, ε=16.0 [l x $mmol^{-1}$ x cm^{-1}]): 80-97%
Na (flame photometric): 6.5-7.5%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
12 207 273 103	custom fill

Will be supplied as "Acetyl-CoA, Tri-Na". Unit of Measure is "g".

DRY ICE

For further processing only.

Acetyl-Coenzyme A
trilithium salt

Cofactor for carnitine acetyl transferase

Application
Use Acetyl-Coenzyme A for the determination of L-carnitine.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 72-89-9

Properties
Formula: $C_{23}H_{35}N_7O_{17}P_3SLi_3$
Molecular weight: 827.4 D (Acetyl-CoA: 809.6 D)

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Acetyl-CoA (enzymatically): ≥83%
Acetyl-CoA (A_{260}, ε=16.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
Li (flame photometric): 2±0.3%
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 150 932 103	custom fill

Will be supplied as "Acetyl Coenzyme A (Acetyl-CoA) Tri-Li". Unit of Measure is "g".

DRY ICE

For further processing only.

Coenzyme A, Grade I
free acid

Cat. No.	Pack Size
10 151 009 103	custom fill

Will be supplied as "Coenzyme A (CoA), Free Acid, Grade I". Unit of Measure is "g".

DRY ICE

For further processing only.

Coenzyme A is a cofactor for some enzymes, *e.g.,* citrate lyase.

Application
Use Coenzyme A in diagnostic tests measuring citrate or citrate lyase. It is also used as an enhancer of luciferase light emission or as a precursor for Acetyl-Coenzyme A or in other chemical or enzymatical reactions.

Benefits
- Rely on the enhanced purity of this Grade I product.

CAS: 85-61-0

Properties
Formula: $C_{21}H_{36}N_7O_{16}P_3S$
Molecular weight: 767.6 D (CoA: 767.6 D)

Specification
Appearance: White to slightly yellow lyophilizate
CoA, reduced (enzymatically, 10 U phosphotransacetylase): ≥85%
CoA (A_{260}, ε=16.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥88%
Water (K. Fischer): ≤6%
Glutathione, reduced (enzymatically): ≤1%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Coenzyme A, Grade I
trilithium salt

Cat. No.	Pack Size
10 121 541 103	custom fill

Will be supplied as "Coenzyme A (CoA), Tri-Li Salt, Grade I". Unit of Measure is "g".

DRY ICE

For further processing only.

Coenzyme A is a cofactor for some enzymes, *e.g.,* citrate lyase.

Application
Use Coenzyme A in diagnostic tests measuring citrate or citrate lyase. It is also used as an enhancer of luciferase light emission or as a precursor for Acetyl-Coenzyme A or in other chemical or enzymatical reactions.

Benefits
- Rely on the enhanced purity of this Grade I product.

CAS: 85-61-0

Properties
Formula: $C_{21}H_{33}N_7O_{16}P_3SLi_3$
Molecular weight: 785.4 D (CoA: 767.6 D)

Specification
Appearance: White to slightly yellow lyophilizate
CoA, reduced (enzymatically with 10 U phosphotransacetylase): ≥83%
CoA (A_{260}, ε=16.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥84%
Water (K. Fischer): ≤6%
Glutathione, reduced (enzymatically): ≤1%
Stability: At -15 to -20°C within specification range for 12 months.

Coenzyme A, Grade II
trilithium salt

Cat. No.	Pack Size
10 155 969 103	custom fill

Will be supplied as "Coenzyme A (CoA), Ttri-Li, Grade II". Unit of Measure is "g".

DRY ICE

For further processing only.

Coenzyme A is a cofactor for some enzymes, *e.g.,* citrate lyase.

Application
Use Coenzyme A in diagnostic tests measuring citrate or citrate lyase. It is also used as an enhancer of luciferase light emission or as a precursor for Acetyl-Coenzyme A or in other chemical or enzymatical reactions.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 85-61-0

Properties
Formula: $C_{21}H_{33}N_7O_{16}P_3SLi_3$
Molecular weight: 785.4 D (CoA: 767.6 D)

Specification
Appearance: White to slightly yellow lyophilizate
CoA, reduced (enzymatically with 10 U phosphotransacetylase): ≥73%
CoA (A_{260}, ε= 16.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥81%
Water (K. Fischer): ≤8%
Stability: At -15 to -20°C within specification range for 12 months. Store dry.

FAD
disodium salt

Cat. No.	Pack Size
10 154 032 103	custom fill

Will be supplied as "Flavine-adenine Dinucleotide (FAD), Di-Na". Unit of Measure is "g".
For further processing only.

Cofactor for dehydrogenases and oxidases.

Application
Use FAD as a cofactor in a variety of enzymatic test or assays to activate enyzmes, especially diagnostic tests for triglycerides.

Benefits
- Rely on the proven diagnostic quality of this product.
- Use FAD to design your diagnostic test

CAS: 146-14-5

Properties
Nomenclature: Flavine-adenine dinucleotide
Formula: $C_{27}H_{31}N_9O_{15}P_2Na_2$
Molecular weight: 829.6 D (FAD: 785.7 D)

Specification
Appearance: Yellow powder
FAD (A_{450}, ε=11.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥86%
Na (flame photometric): 5±1%
Water (K. Fischer): ≤9%
P_i: ≤0.6%
Stability: At +2 to +8°C within specification range for 24 months. Protect from light.

NAD, Grade I
free acid

Cat. No.	Pack Size
10 004 618 103	custom fill

Will be supplied as "b-Nicotinamide-adenine Dinucleotide, I". Unit of Measure is "kg".
For further processing only.

Cofactor for dehydrogenases, *e.g.,* lactate dehydrogenase.

Application
Use NAD, Grade I as a cofactor in a variety of diagnostic tests, such as for the determination of ethanol and lactate dehydrogenase.

Benefits
Rely on the enhanced purity.

CAS: 53-84-9

Properties
Formula: $C_{21}H_{27}N_7O_{14}P_2$
Molecular weight: 663.4 D

Specification
Appearance: Colorless to slightly yellowish lyophilizate
Solubility: Clear, colorless to slightly yellowish solution in water (c=200 mg/ml)
β-NAD (from value found enzymatically, based on dry weight): ≥99%
β-NAD (enzymatically, A_{340}): ≥96.5%
β-NAD (A_{260}, ε=17.6 [l x $mmol^{-1}$ x cm^{-1}]): ≥96.5%
NAD (HPLC): ≥98 area%
Water (K. Fischer): ≤3.5%
Fe (AA): ≤50 ppm
AMP (enzymatically): ≤0.1%
Ethanol (GC): ≤43 ppm
Aceton, isopropanol, methanol (GC): each ≤0.05%
Reaction rates (LDH) based on NAD II, acid: 95-105%
A_{250}/A_{260}: 0.81-0.85
A_{280}/A_{260}: 0.20-0.24
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

NAD, Grade II
free acid

Cat. No.	Pack Size
10 004 626 103	custom fill

Will be supplied as "b-Nicotinamide-adenine Dinucleotide, II". Unit of Measure is "kg".
For further processing only.

Cofactor for dehydrogenases, *e.g.,* lactate dehydrogenase.

Application
Use NAD, Grade II as a cofactor in a variety of diagnostic tests, such as for the determination of ethanol and lactate dehydrogenase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 53-84-9

Properties
Formula: $C_{21}H_{27}N_7O_{14}P_2$
Molecular weight: 663.4 D

Specification
Appearance: Colorless to slightly yellowish lyophilizate
Solubility: Clear, colorless to slightly yellowish solution in water (c=200 mg/ml)
β-NAD (from value found enzymatically, based on dry weight): ≥97.5%
β-NAD (enzymatically, A_{340}): ≥94.5%

β-NAD (A_{260}, ε=17.6 [l x $mmol^{-1}$ x cm^{-1}]): ≥94.5%
NAD (HPLC): ≥95 area%
Water (K. Fischer): ≤3.5%
Fe (AA): ≤25 ppm
AMP (enzymatically): ≤0.1%
Ethanol (GC): ≤40 ppm
Aceton, isopropanol, methanol (GC): ≤0.1%, ≤0.15%, ≤0.15%
Reaction rates (LDH) based on NAD II, acid: 95-105%
A_{250}/A_{260}: 0.81-0.85
A_{280}/A_{260}: 0.20-0.24
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

NADH, Grade I
disodium salt

Cofactor for a variety of dehydrogenases, *e.g.*, malate dehydrogenase and lactate dehydrogenase.

Application
Use NADH, Grade I, as a cofactor in a variety of diagnostic tests, such as for glutamate dehydrogenase, lactate dehydrogenase, α-hydroxybutyrate dehydrogenase, aminotransferases and urea.

Benefits
Rely on the enhanced purity of this Grade I product.

CAS: 58-68-4

Properties
Formula: $C_{21}H_{27}N_7O_{14}P_2Na_2$
Molecular weight: 709.4 D (NADH: 665.4 D)

Specification
Appearance: White to slightly yellowish amorphous powder
Solubility: Clear, colorless to slightly yellowish solution in water (c=50 mg/ml)
$NADH\text{-}Na_2$ (calculated from value found enzymatically, based on dry weight): ≥99%
NADH (enzymatically, A_{340}): ≥85%
NADH (A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
NADH (A_{260}, ε=14.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
Na (flame photometric): 6.5±0.5%
Water (K. Fischer): ≤5%
NAD (enzymatically): ≤0.5%
AMP (enzymatically): ≤0.2%
Ethanol (GC): ≤4%
Reaction rates (LDH) based on standard: 95-105%
A_{260}/A_{340}: ≤2.35
Stability: At +2 to +8°C within specification range for 12 months. Keep under nitrogen. Protect from light.

Cat. No.	Pack Size
10 004 634 103	250g or custom fill

Will be supplied as "b-NADH, Reduced, Disodium Salt, Grade I".
Unit of Measure is "kg".
For further processing only.

NADH, Grade II
disodium salt

Cofactor for a variety of dehydrogenases, *e.g.,* malate dehydrogenase and lactate dehydrogenase.

Application
Use NADH, Grade II, as a cofactor in a variety of diagnostic tests, such as for glutamate dehydrogenase, lactate dehydrogenase, α-hydroxybutyrate dehydrogenase, aminotransferases and urea.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 58-68-4

Properties
Formula: $C_{21}H_{27}N_7O_{14}P_2Na_2$
Molecular weight: 709.4 D (NADH: 665.4 D)

Specification
Appearance: White to slightly yellowish amorphous powder
Solubility: Clear, colorless to slightly yellowish solution in water (c=50 mg/ml)
NADH-Na_2 (calculated from value found enzymatically, based on dry weight): ≥98%
NADH (enzymatically, A_{340}): ≥84%
NADH (A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥84%
NADH (A_{260}, ε=14.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
Na (flame photometric): 6.5±0.5%
Water (K. Fischer): ≤6%
NAD (enzymatically): ≤1%
AMP (enzymatically): ≤0.2%
Ethanol (GC): ≤4%
Reaction rates (LDH) based on standard: 95-105%
A_{260}/A_{340}: ≤2.40
A_{260}/A_{240}: 1.57-2.17
Stability: At +2 to +8°C within specification range for 12 months. Keep under nitrogen. Protect from light.

Cat. No.	Pack Size
10 004 642 103	250g or custom fill

Will be supplied as "b-NADH, Reduced, Disodium Salt, Grade II".
Unit of Measure is "kg".
For further processing only.

NADH, Grade II

for potassium test, disodium salt

NADH quality for enzymatic potassium test.

Application

Use this special NADH as a cofactor in a diagnostic test for potassium, together with glutamate dehydrogenase to remove ammonia from the reaction mixture.

Benefits

- Rely on the proven diagnostic quality of this product.
- Rely on the strongly reduced concentration of potassium.

CAS: 58-68-4

Properties

Formula: $C_{21}H_{27}N_7O_{14}P_2Na_2$
Molecular weight: 709.4 D (NADH: 665.4 D)

Specification

Appearance: White to slightly yellowish amorphous powder
Solubility: Clear, colorless to yellowish solution in water (c=50 mg/ml)
NADH-Na_2 (from content found enzymatically, based on dry weight): ≥98%
NADH (enzymatically): ≥82%
NADH (A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥84%
NADH (A_{260}, ε=14.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
Na (flame photometric): 6.5±0.5%
K (AAS): ≤250 ppm
Water (K. Fischer): ≤6%
NAD (enzymatically): ≤1%
AMP (enzymatically): ≤0.2%
Ethanol (GC): ≤4%
Reaction rates (Lactate dehydrogenase), based on standard:
Freshly dissolved sample: 95–105%
After 8 days incubation at +45°C: ≥95%
HPLC:
Freshly dissolved sample: ≥96.0 area%
After 8 days incubation at +45 °C: ≥75%
A_{260}/A_{340}: ≤2.4
A_{260}/A_{240}: 1.57–2.17
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
11 333 925 103	custom fill

Will be supplied as "NADH Di-Na, Grade II for Potassium Test".
Unit of Measure is "kg".

DRY ICE

For further processing only.

NADP
disodium salt

Cofactor for dehydrogenases, *e.g.,* glucose-6-phosphate dehydrogenase.

Application
Use NADP as a cofactor in a variety of diagnostic tests, such as for the determination of glucose and creatine kinase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 53-59-8

Properties
Formula: $C_{21}H_{26}N_7O_{17}P_3Na_2$
Molecular weight: 787.4 D (NADP: 743.4 D)

Specification
Appearance: White to yellowish amorphous powder
Solubility: Clear, colorless solution in water (c=50 mg/ml)
NADP, Na-salt (from value found enzymatically, based on dry weight): ≥97%
NADP (enzymatically, A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
NADP (A_{260}, ε=18 [l x $mmol^{-1}$ x cm^{-1}]): ≥85%
Na (flame photometric): 4.5±0.5%
Water (K. Fischer): ≤6%
NAD (enzymatically): ≤0.5%
Methanol (GC): ≤3%
A_{360} (c=10 mg/ml water, against water): ≤0.600
A_{340} (c=0.01 mg/ml phosphate buffer, pH 7.0): ≤0.005
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Cat. No.	Pack Size
10 004 669 103	custom fill

Will be supplied as "b-NADP, Disodium Salt". Unit of Measure is "kg".
For further processing only.

NADP
monopotassium salt

Cofactor for dehydrogenases, *e.g.,* glucose-6-phosphate dehydrogenase.

Application
Use NADP as a cofactor in a variety of diagnostic tests, such as for the determination of glucose and creatine kinase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 53-59-8

Properties
Formula: $C_{21}H_{27}N_7O_{17}P_3K \times 2\ H_2O$
Molecular weight: 817.4 D (NADP: 743.4 D)

Specification
Appearance: White cristalline powder
NADP, K-salt (calculated from value determined enzymatically, based on dry weight): ≥97%
NADP (enzymatically, A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥88%
NADP (A_{260}, ε=18 [l x $mmol^{-1}$ x cm^{-1}]): ≥88%
K (flame photometric): 4.0-5.0%
Water (K. Fischer): ≤4.5±1.0%
NAD (enzymatically): ≤0.2%
Methanol (GC): ≤2%
Mg (AAS): ≤40 ppm
A_{360} (c=10 mg/ml water, against water): ≤0.600
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
10 233 536 103	custom fill

Will be supplied as "b-NADP, Monopotassium Salt". Unit of Measure is "g".
DRY ICE
For further processing only.

NADPH
tetrasodium salt

Cat. No.	Pack Size
10 041 939 103	custom fill

Will be supplied as "b-NADPH, Reduced, Tetrasodium Salt". Unit of Measure is "g".
For further processing only.

Cofactor for glutamate dehydrogenase.

Application
Use NADPH as a cofactor in diagnostic tests for ammonia, urea and creatinine.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 53-57-6

Properties
Formula: $C_{21}H_{26}N_7O_{17}P_3Na_4$
Molecular weight: 833.4 D (NADPH: 745.4 D)

Specification
Appearance: White to slightly yellowish amorphous powder
Particle size (screen analysis according to Ph.Eur., US mesh <30): ≥95%
Solubility: Clear, colorless to slightly yellowish solution in water (c=50 mg/ml)
NADPH-Na_4 (calculated from content found enzymatically, based on dry weight): ≥97%
NADPH (enzymatically, A_{340}): ≥79%
NADPH (A_{340}, ε=6.3 [l x $mmol^{-1}$ x cm^{-1}]): ≥0 79%
NADPH (A_{260}, ε=15 [l x $mmol^{-1}$ x cm^{-1}]): ≥80%
NADPH (HPLC): ≥95 area%
Na (flame photometric): 11±1%
Water (K. Fischer): ≤6%
NADH (HPLC): ≤0.5 area%
NADP (HPLC): ≤0.5 area%
NADP (enzymatically): ≤0.5%
Nicotinic acid amide: ≤2 area%
Ethanol (GC): ≤3%
A_{260}/A_{340}: 2.32-2.65
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Thio-NAD
free acid

Cat. No.	Pack Size
04 635 396 103	custom fill

Will be supplied as "Thio-NAD free acid". Unit of Measure is "g".
DRY ICE
For further processing only.

NAD analog with an absorbance maximum of thio-NADH at 405 nm.

Application
Use Thio-NAD instead of NAD in enzymatic reactions to measure the reaction kinetics at 405 nm, *e.g.,* kinetic enzyme cycling methods using Thio-NAD and NADH.

Benefits
- Use Thio-NAD in your sensitive enzymatic diagnostic test.
- Take advantage of the increased absorption maximum.

CAS: 4090-29-3

Properties
Formula: $C_{21}H_{27}N_7O_{13}SP_2$
Molecular weight: 679.5 D

Specification
Appearance: Yellowish powder
Solubility: Clear, colorless to slightly yellowish solution in water (c=37 mg/ml)

Thio-NAD (A_{259}, ε=19.7 l x $mmol^{-1}$ x cm^{-1}): ≥95%
Water (K. Fischer): ≤4%
A_{398}/A_{340} (against water) : ≤0.124
A_{236}/A_{259} (against water) : 0.640-0.670
A_{296}/A_{259} (against water) : 0.244-0.264
Revision of absorption in presence of 0.4 mmol/l NADH: ≤0.001 abs/min
Ca (AAS): No limit
Mg (AAS): No limit
Stability: At -15 to -25°C within specification range for 12 months.

Adenosine-5'-O-(2-thiodiphosphate)
trilithium salt

Non-hydrolyzable ADP analog.

Application
Use Adenosine-5'-O-(2-thiodiphosphate) to inhibit ADP-binding enzymes.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 73536-95-5

Properties
Formula: $C_{10}H_{12}N_5O_9P_2SLi_3$
Molecular weight: 461.0 D (ATP-β-S: 443.2 D)

Specification
Appearance: White powder
ATP-β-S, Li (A_{260}): ≥81%
ATP-β-S (A_{260}, ε= 15.0 [l x mmol^{-1} x cm^{-1}]): ≥78%
ATP-β-S (HPLC): ≥90 area%
Li (flame photometric): 3-5%
Water (K. Fischer): ≤12%
ATP (HPLC): ≤5 area%
ADP (HPLC): ≤1 area%
AMP (HPLC): ≤4 area%
A_{250}/A_{260}: 0.75-0.83
A_{280}/A_{260}: 0.14-0.18
A_{290}/A_{260}: 0.00-0.01
Stability: At -15 to -25°C within specification range for 12 months. Protect from light.

Cat. No.	Pack Size
10 200 166 103	custom fill

Will be supplied as "Adenosine-5'-O-(2-thiodiphosphate) Tri-Li". Unit of Measure is "g".

DRY ICE

For further processing only.

Adenosine-5'-O-(3-thiotriphosphate)
tetralithium salt

Non-hydrolyzable ATP analog.

Application
Use Adenosine-5'-O-(3-thiotriphosphate) to inhibit ATP-binding enzymes.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 35094-45-2

Properties
Formula: $C_{10}H_{12}N_5O_{12}P_3SLi_4$
Molecular weight: 547.0 D (ATP-γ-S: 523.2 g/mol)

Specification
Appearance: White powder
ATP-γ-S, Li (A_{260}): ≥78%
ATP-γ-S (A_{260}, ε=15.0 [l x mmol^{-1} x cm^{-1}]): ≥74%
ATP-γ-S (HPLC): ≥85 area%
Li (flame photometric): 3-5%
Water (K. Fischer): ≤12%
ADP (HPLC): ≤12 area%
AMP (HPLC): ≤3 area%
A_{250}/A_{260}: 0.79±0.02

Cat. No.	Pack Size
10 122 734 103	custom fill

Will be supplied as "Adenosine-5'-O-(3-thiotriphosphate), Li4". Unit of Measure is "g".

DRY ICE

For further processing only.

A_{280}/A_{260}: 0.16±0.01
A_{290}/A_{260}: ≤0.05
Stability: At -15 to -25°C within specification range for 6 months. Protect from light.

ADP
potassium salt

Cofactor for diagnostic tests.

Cat. No.	Pack Size
10 233 528 103	custom fill

Will be supplied as "Adenosine-5'-diphosphate (ADP), K-Salt".
Unit of Measure is "kg".
For further processing only.

Application
Use ADP in variety of diagnostic tests, such as for the determination of creatine kinase and pyruvate kinase. Use it also for the activation of glutamate dehydrogenase in the determination of for example urea or ammonia.

Benefits
- Enhance the activation of your glutamate dehydrogenase containing reagents and rely on the proven diagnostic quality of this product.

CAS: 58-64-0

Properties
Formula: $C_{10}H_{14}N_5O_{10}P_2K \times 2\ H_2O$
Molecular weight: 501.3 D (ADP: 427.2 D)
Remark: Crystalline ADP-K x 2 H_2O is the purest and most stable form of ADP available.

Specification
Appearance: Colorless crystals
Solubility: Clear, colorless solution in water (c=50 mg/ml)
ADP-K x 2 H_2O (based on value found enzymatically): ≥98%
ADP (enzymatically): ≥84%
ADP (A_{260}, ε= 15 [l x $mmol^{-1}$ x cm^{-1}]): ≥84%
K (flame photometric): 7.8±0.5%
Water (K. Fischer): 7.2±1%
P_i (Fiske and Subbarow): ≤0.3%
AMP (enzymatically): ≤1%
ATP (enzymatically): ≤0.2%
NH_4 (enzymatically): ≤0.005%
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.16±0.01
A_{290}/A_{260}: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

ADP
disodium salt

Cofactor for diagnostic tests.

Cat. No.	Pack Size
10 129 062 103	custom fill

Will be supplied as "ADP, Di-Na". Unit of Measure is "kg".
For further processing only.

Application
Use ADP in variety of diagnostic tests, such as for the determination of creatine kinase and pyruvate kinase. Use it also for the activation of glutamate dehydrogenase in the determination of for example urea or ammonia.

Benefits
- Enhance the activation of your glutamate dehydrogenase containing reagents
- Rely on the proven diagnostic quality of this product.

CAS: 58-64-0

Properties
Formula: $C_{10}H_{13}N_5O_{10}P_2Na_2$
Molecular weight: 471.2 D (ADP: 427.2 D)
Remark: ATP and AMP may form during storage.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=50 mg/ml)
ADP-Na-salt (calculated on value found enzymatically): ≥90%
ADP (enzymatically): ≥82%
ADP (A_{260}, ε= 15 [l x $mmol^{-1}$ x cm^{-1}]): ≥82%
Na (flame photometric): 9±1%
Water (K. Fischer): ≤7%
P_i (Fiske and Subbarow): ≤0.6%
AMP (enzymatically): ≤3%
ATP (enzymatically): ≤1%
NH_4 (enzymatically): ≤0.01%
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.16±0.01
A_{290}/A_{260}: ≤0.01
Stability: At -15 to -25°C within specification range for 6 months. Store dry.

ADP for potassium test
free acid

Cat. No.	Pack Size
11 333 879 103	custom fill

Will be supplied as "ADP Free Acid for Potassium Test". Unit of Measure is "kg".

DRY ICE

For further processing only.

Application
Use ADP for potassium testing as an activator for glutamate dehydrogenase in enzymatic potassium tests.

Benefits
- Take advantage of the strongly reduced potassium concentration.
- Enhance your enzymatic potassium test
- Rely on the proven diagnostic quality of this product.

CAS: 58-64-0

Properties
Formula: $C_{10}H_{15}N_5O_{10}P_2$
Molecular weight: 427.2 D
Remark: ATP and AMP may form during storage.

Specification
Appearance: White crystallizate
Solubility: Clear, colorless solution in NaOH, 0.1 mol/l (c=50 mg/ml)
IR-spectrum (KBr-pellet): Corresponds to reference
ADP (enzymatically): ≥97%
ADP (A_{260}, ε= 15 [l x $mmol^{-1}$ x cm^{-1}]): ≥97%
Water (K. Fischer): ≤2%
P_i (Fiske and Subbarow): ≤0.6%
AMP (enzymatically): ≤3%
ATP (enzymatically, HK/G6P-DH): ≤0.3%
Na (AAS): ≤750 ppm
K (AAS): ≤20 ppm
NH_4 (enzymatically): ≤0.01%
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.16±0.01
A_{290}/A_{260}: ≤0.01
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

AMP
free acid

Nucleotide for diagnostic tests.

Application
Use AMP for the determination of 5'-nucleotidase and in diagnostic tests for the determination of creatine kinase.

Benefits
- Enhance the performance of your creatine kinase test.
- Rely on the proven diagnostic quality of this product.

CAS: 61-19-8

Properties
Formula: $C_{10}H_{14}N_5O_7P \times H_2O$
Molecular weight: 365.2 D (AMP: 347.2 D)

Specification
Appearance: White, crystalline powder
Solubility: Clear, colorless solution in NaOH, 1 mol/l (c=50 mg/ml)
AMP x H_2O (based on value found enzymatically): ≥98%
AMP (enzymatically): ≥93%
AMP (A_{260}, ε=15.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥93%
Water (K. Fischer): ≤5±2%
P_i: ≤0.3%
Fe (bathophenanthrolin): ≤10 ppm
Heavy metals (as Pb): ≤10 ppm
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.15±0.01
A_{290}/A_{260}: ≤0.01
Stability: At +15 to +25°C within specification range for 36 months. Store dry.

Cat. No.	Pack Size
10 000 086 103	custom fill

Will be supplied as "Adenosine-5'-monophosphoric Acid (AMP)".
Unit of Measure is "kg".
For further processing only.

AMP
disodium salt

Nucleotide for diagnostic tests.

Application
Use AMP for the determination of 5'-nucleotidase and in diagnostic tests for the determination of creatine kinase.

Benefits
- Enhance the performance of your creatine kinase test
- Rely on the proven diagnostic quality of this product.

CAS: 61-19-8

Properties
Formula: $C_{10}H_{12}N_5O_7PNa_2$
Molecular weight: 391.2 D (AMP: 347.2 D)

Specification
Appearance: White crystals
Solubility: Clear, colorless solution in water (c=50 mg/ml)
AMP (enzymatically): ≥76%
AMP (A_{260}): ≥76%
Na (flame photometric): 10-12%
Water (K. Fischer): ≤12%
P_i: ≤0.3%
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.16±0.01
A_{290}/A_{260}: ≤0.01
Stability: At +15 to +25°C within specification range for 36 months. Store dry.

Cat. No.	Pack Size
10 000 094 103	custom fill

Will be supplied as "Adenosine-5'-monophosphate (AMP), Di-Na". Unit of Measure is "kg".
For further processing only.

ATP, Grade I
disodium salt

Cofactor for kinases, *e.g.* glycerokinase and hexokinase.

Application
Use ATP, Grade I, in a variety of diagnostic tests, such as for the determination of triglycerides, creatine kinase and glucose.

Benefits
Rely on the enhanced purity of this grade I product.

CAS: 56-65-5

Properties
Formula: $C_{10}H_{14}N_5O_{13}P_3Na_2 \times 3\ H_2O$
Molecular weight: 605.2 D (ATP: 507.2 D)

Specification
Appearance: White crystals
Solubility: Clear, colorless solution in water (c=50 mg/ml)
ATP-Na_2 x 3 H_2O (based on value found enzymatically): ≥99%
ATP (enzymatically): ≥84%
ATP (A_{260}, ε=15.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥84%
Na (flame photometric): 7.5±0.5%
Water (K. Fischer): ≤8±1%
P_i: ≤0.15%
ADP, AMP (enzymatically): ≤0.5%

Cat. No.	Pack Size
10 422 495 103	custom fill

Will be supplied as "ATP, Di-Na, Special Quality". Unit of Measure is "kg".
For further processing only.

GTP (HPLC): ≤0.01 area%
Fe (AAS): ≤10 ppm
Mg (AAS): ≤10 ppm
Ca (AAS): ≤20 ppm
Zn (AAS): ≤5 ppm
V (AAS): ≤1 ppm
A_{250}/A_{260}: 0.79±0.02
A_{280}/A_{260}: 0.15±0.01
A_{290}/A_{260}: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

ATP, Grade II
disodium salt

Cofactor for kinases, *e.g.* glycerokinase and hexokinase.

Application
Use ATP, Grade II in a variety of diagnostic tests, such as for the determination of triglycerides and glucose.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 56-65-5

Properties
Formula: $C_{10}H_{14}N_5O_{13}P_3Na_2 \times 3\ H_2O$
Molecular weight: 605.2 D (ATP: 507.2 D)

Specification
Appearance: White crystals
Solubility: Clear, colorless solution in water (c=50 mg/ml)
ATP-Na_2 x 3 H_2O (based on value found enzymatically): ≥98%
ATP (enzymatically): ≥82%
ATP (A_{260}, ε=15.0 [l x $mmol^{-1}$ x cm^{-1}]): ≥82%
Na (flame photometric): 7.5±0.5%
Water (K. Fischer): ≤10%
P_i: ≤0.3%
ADP, AMP (enzymatically): ≤0.5%
GTP (HPLC): ≤0.01 area%
Fe (AAS): ≤15 ppm
Heavy metals (as Pb): ≤30 ppm
A_{250}/A_{260}: 0.79±0.02
A_{280}/A_{260}: 0.15±0.01
A_{290}/A_{260}: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Cat. No.	Pack Size
10 000 116 103	custom fill

Will be supplied as "Adenosine-5'-triphosphate (ATP), Di-Na". Unit of Measure is "kg".
For further processing only.

Guanosine-5'-O-(3-thiodiphosphate)
tetralithium salt

Non-hydrolyzable GTP analog.

Application
Use Guanosine-5'-O-(3-thiodiphosphate) to inhibit GTP-binding enzymes and activate G-proteins.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 37589-80-3

Properties
Formula: $C_{10}H_{12}N_5O_{13}P_3SLi_4$
Molecular weight: 563.0 D (GDP-γ-S: 539.2 D)

Specification
Appearance: White powder
GTP-γ-S-Li (A_{254}): ≥77%
GTP-γ-S (A_{254}, ε=13.5 [l x $mmol^{-1}$ x cm^{-1}]): ≥73%
GDP-γ-S (HPLC): ≥85 area%
Li (flame photometric): 5±1%
Water (K. Fischer): ≤12%
GDP (HPLC): ≤12 area%
GMP (HPLC): ≤1 area%
GTP (HPLC): ≤2 area%
A_{250}/A_{260}: 1.14±0.05
A_{280}/A_{260}: 0.65±0.04
A_{290}/A_{260}: 0.27±0.03
Stability: At -15 to -25°C within specification range for 6 months. Store dry.

Cat. No.	Pack Size
10 220 655 103	custom fill

Will be supplied as "Guanosine-5'-O-(3-thiotriphosphate), Li4".
Unit of Measure is "g".

DRY ICE

For further processing only.

Guanosine-5'-O-(2-thiodiphosphate)
trilithium salt

Non-hydrolyzable GDP analog.

Application
Use Guanosine-5'-O-(2-thiodiphosphate) to completely inhibit G protein activation by GTP and GTP analogs.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 71376-97-1

Properties
Formula: $C_{10}H_{12}N_5O_{10}P_2SLi_3$
Molecular weight: 477.0 D (GDP-β-S: 459.3 D)

Specification
Appearance: White powder
GDP-β-S (HPLC): ≥85 area%
Li (flame photometric): 4±1%
Water (K. Fischer): ≤12%
GMP (HPLC): ≤10 area%
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
10 526 134 103	custom fill

Will be supplied as "Guanosine-5'-O-(2-thiodiphosphate) Tri-Li".
Unit of Measure is "g".

DRY ICE

For further processing only.

Enzymes for Clinical Chemistry

Colorimetric Tests

*Indicator reaction

$$H_2O_2 + \text{indicator} \xrightarrow{\text{peroxidase}} \text{dye} + H_2O$$

Peroxidase (POD), Grade II (128)
4-Aminoantipyrine (4-APP) (139)
TOOS (145)

Alkaline phosphatase (ALP)

$$4\text{–Nitrophenyl phosphate (colorless)} \xrightarrow{\text{ALP}} 4\text{–Nitrophenol (yellow)}$$

4-Nitrophenyl phosphate (4-NPP) (141)

Cholesterol

$$\text{Cholesterol ester} + H_2O \xrightarrow{\text{cholesterol esterase}} \text{cholesterol} + \text{FFA}$$

$$\text{Cholesterol ester} + O_2 \xrightarrow{\text{cholesterol oxidase}} \text{cholestone} + H_2O_2\,*$$

Cholesterol Esterase (71)
Cholesterol Oxidase (75)

α-Amylase

$$5\ \text{ethylidene}-G_7\text{pNP (EPS)} + 5\ H_2O \xrightarrow{\alpha-\text{amylase}} \text{ethylidene}-G_3 + \text{pNP}-G_4 +$$
$$2\ \text{ethylidene}-G_4 + 2\ \text{pNP}-G_3 + 2\ \text{ethylidene}-G_5 + 2\ \text{pNP}-G_2$$

$$\text{pNP}-G_4 + 2\ \text{pNP}-G_3 + 2\ \text{pNP}-G_2 + 14\ H_2O \xrightarrow{\alpha-\text{glucosidase}} 5\ \text{pNP} + 14\ G$$

Ethylidene-4-NP-G7 (144)
α-Glucosidase (96)

Creatinine

$$\text{Creatinine} + H_2O \xrightarrow{\text{creatininase}} \text{creatine}$$

$$\text{Creatine} + H_2O \xrightarrow{\text{creatinase}} \text{sarcosine} + \text{urea}$$

$$\text{Sarcosine} + O_2 + H_2O \xrightarrow{\text{sarcosine oxidase}} \text{glycine} + \text{formaldehyde} + H_2O_2\,*$$

$$\text{Removal of ascorbate: 2 L–ascorbate} + O_2 + H_2O \xrightarrow{\text{ascorbate oxidase}} \text{2 L–dehydroascorbic acid} + 2\ H_2O$$

Creatininase (82)
Creatinase (82)
Sarcosine oxidase (135)
Ascorbate oxidase (66)

Glucose

$$(\alpha\text{–D–Glucose} \xrightarrow{\text{mutarotase}} \beta\text{–D–Glucose})$$

$$\beta\text{–D–Glucose} + O_2 + H_2O \xrightarrow{\text{glucose oxidase}} \text{gluconolactone} + H_2O_2\,*$$

Glucose oxidase (GOD), Grade II (87)
Glucose oxidase (GOD), chemically modified (88)
Aldose 1-epimerase (Mutarotase) (65)

γ-Glutamyltransferase

$$\text{Glupa - carboxylate (donor)} + \text{glycylglycine (acceptor)} \xrightarrow{\gamma\text{ - glutamyltransferase}} \text{p – nitroaniline (yellow)} + \gamma\text{ - glutamylglycylglycine}$$

Glupa-carboxylate (144)
Glycylglycine (16)

Lactate

$$\text{L – Lactate} \xrightarrow{\text{lactate oxidase}} \text{pyruvate} + H_2O_2\,*$$

Lactate 2-monooxygenase (Lactate oxidase), Grade II (119)

Lipase

$$\text{Chromogenic substrate for lipase} \xrightarrow{\text{lipase}} \text{glutaric acid – (6 – methylresorufin) ester}$$

$$\text{Glutaric acid – (6 – methylresorufin) ester} \xrightarrow{\text{spontaneous}} \text{glutaric acid} + \text{methylresorufin (red)}$$

Chromogenic Substrate for Lipase (142)
Colipase (81)

Triglycerides

$$\text{Triglycerides} + 3\,H_2O \xrightarrow{\text{lipoprotein lipase}} \text{glycerol} + 3\text{ fatty acids}$$

$$\text{Glycerol} + \text{ATP} \xrightarrow{\text{glycerokinase}} \text{glycerol–3–phosphate} + \text{ADP}$$

$$\text{Glycerol–3–phosphate} + O_2 \xrightarrow{\text{glycerol-3-phosphate oxidase}} \text{dihydroxyacetone} + H_2O_2\,*$$

Lipoprotein lipase (120)
Glycerokinase (GK) (102)
Glycerol-3-phosphate oxidase (104)
ATP, Grade I (49)

Uric acid

$$\text{Uric acid} + 2\,H_2O + O_2 \xrightarrow{\text{uricase}} \text{allantoin} + CO_2 + H_2O_2\,*$$

$$\text{Removal of ascorbate: 2 L–ascorbate} + O_2 + H_2O \xrightarrow{\text{ascorbate oxidase}} \text{2 L– dehydroascorbic acid} + 2\,H_2O$$

Uricase (138)
Ascorbate oxidase (66)

UV Tests

Alanine aminotransferase (ALT)

$$\text{L-Alanine} + \alpha\text{-ketoglutarate} \xrightarrow{\text{ALT}} \text{pyruvate} + \text{L-glutamate}$$

$$\text{Pyruvate} + \text{NADH} + \text{H}^{\oplus} \xrightarrow{\text{lactate dehydrogenase}} \text{L-lactate} + \text{NAD}^{\oplus}$$

L-Alanine (147)
α-Ketoglutarate (2-Oxoglutarate) (147)
D-Lactate dehydrogenase (D-LDH) (110)
NADH, Grade I (39)

Aspartate aminotransferase (AST)

$$\text{L-Aspartate} + \alpha\text{-ketoglutarate} \xrightarrow{\text{AST}} \text{oxaloacetate} + \text{L-glutamate}$$

$$\text{Oxaloacetate} + \text{NADH} + \text{H}^{\oplus} \xrightarrow{\text{malate dehydrogenase}} \text{L-malate} + \text{NAD}^{\oplus}$$

α-Ketoglutarate (2-Oxoglutarate) (147)
Malate dehydrogenase (123)
D-Lactate dehydrogenase (D-LDH), Grade II (112)
NADH, Grade I (39)

Creatine kinase

$$\text{Creatine phosphate} + \text{ADP} \xrightarrow{\text{creatine kinase}} \text{creatine} + \text{ATP}$$

$$\text{ATP} + \text{glucose} \xrightarrow{\text{hexokinase}} \text{glucose-6-phosphate} + \text{ADP}$$

$$\text{Glucose-6-phosphate} + \text{NADP}^{\oplus} \xrightarrow{\text{G6PDH}} \text{6-phosphogluconate} + \text{NADPH} + \text{H}^{\oplus}$$

Creatine phosphate (150)
Hexokinase (107)
Glucose-6-phosphate dehydrogenase (G6P-DH) (89)
NADP (42)

Ethanol

$$\text{Ethyl alcohol} + \text{NAD}^{\oplus} \xrightarrow{\text{alcohol dehydrogenase}} \text{acetaldehyde} + \text{NADH} + \text{H}^{\oplus}$$

Alcohol dehydrogenase (63)
NAD, Grade I (38)

Glucose

$$\text{Glucose} + \text{ATP} \xrightarrow{\text{hexokinase}} \text{glucose-6-phosphate} + \text{ADP}$$

$$\text{Glucose-6-phosphate} + \text{NADP} \xrightarrow{\text{G6PDH}} \text{6-phosphogluconate} + \text{NADPH} + \text{H}^{\oplus}$$

Hexokinase (107)
Glucose-6-phosphate dehydrogenase (G6P-DH) (89)
NADP (42)

Lactate dehydrogenase

$$\text{L-Lactate} + \text{NAD}^{\oplus} \xrightarrow{\text{lactate dehydrogenase}} \text{pyruvate} + \text{NADH} + \text{H}^{\oplus}$$

D(-)-Lactate (151)
NAD, Grade I (38)

Urea

$$\text{Urea} + 2\text{H}_2\text{O} \xrightarrow{\text{Urease}} 2\,\text{NH}^{4+} + \text{CO}_3^{2-}$$

$$\text{NH}^{4+} + \alpha\text{-ketoglutarate} + \text{NADH} \xrightarrow{\text{GLDH}} \text{L-glutamate} + \text{NAD}^{\oplus} + \text{H}_2\text{O}$$

Urease (137)
α-Ketoglutarate (2-Oxoglutarate) (147)
NADH, Grade I (39)

Acetate-CoA Ligase (Acetyl-CoA Synthetase)

from yeast, lyophilizate

Cat. No.	Pack Size
10 128 180 103	custom fill

Will be supplied as "Acetyl-CoA Synthetase from Yeast". Unit of Measure is "kU".
For further processing only.

Ligase that catalyzes the synthesis of acetyl-CoA from acetate and coenzyme A.

Application
Use Acetate-CoA Ligase (Acetyl-CoA Synthetase) in diagnostic tests for the determination of free fatty acids in combination with Acyl-CoA Oxidase, Catalog No. 10 885 550 103 or for the determination of acetic acid in combination with Citrate Synthase, Catalog No.10 153 605 103 and Malate Dehydrogenase, Catalog No. 10 200 387 103

Benefits
Rely on the proven diagnostic quality of this product.

EC 6.2.1.1

Specification
Appearance: White lyophilizate
pH value (c=20 mg/ml in water): 6.8-7.8
Specific activity (+37°C, acetate): ≥4 U/mg protein
Protein (Biuret): ≤0.25 mg/mg lyophilizate
Acetate (enzymatically): ≤0.1%
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Acetate-CoA Ligase (Acetyl-CoA Synthetase)

from microorganism, lyophilizate

Cat. No.	Pack Size
10 885 568 103	custom fill

Will be supplied as "Acyl-CoA-Synthetase, Lyo.". Unit of Measure is "kU".
DRY ICE
For further processing only.

Ligase that catalyzes the synthesis of acetyl-CoA from acetate and coenzyme A.

Application
Use Acetate-CoA Ligase (Acetyl-CoA Synthetase) in diagnostic tests for the determination of free fatty acids in combination with Acyl-CoA Oxidase, Catalog No. 10 885 550 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 6.2.1.1

Specification
Appearance: White lyophilizate
Activity (+37°C, enzymatically): ≥1.5 U/mg lyophilizate
Specific Activity (enzymatically): ≥1.5 U/mg protein
Absorbance of the solution (2 U/ml):
A_{400}: ≤0.05
A_{500}:≤0.025
A_{650}: ≤0.012
Contaminants:
Lipase (indirect): -5% bis +15%
Stability: At -15 to -25 °C within specification range for 12 months. Store dry in tightly sealed containers.

Acid Phosphatase
from potato, lyophilizate

Cat. No.	Pack Size
10 154 393 103	custom fill

Will be supplied as "Phosphatase, Acid, Grade II from Potato". Unit of Measure is "kU".
For further processing only.

Application
Use Acid Phosphatase in your controls or calibrators.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.1.3.2

Specification
Appearance: Pale brown lyophilizate
Activity (+25°C, 4-nitrophenyl phosphate): ≥2 U/mg lyophilizate
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Acyl-CoA Oxidase
from microorganisms, lyophilizate

Cat. No.	Pack Size
10 885 550 103	custom fill

Will be supplied as "Acyl-CoA-Oxidase, Lyo.". Unit of Measure is "kU".
DRY ICE
For further processing only.

Oxidoreductase that catalyzes the interconversion of acyl-CoA to trans-2,3-dehydroacyl-CoA.

Application
Use Acyl-CoA Oxidase in diagnostic tests for the determination of free fatty acids in combination with Acetate-CoA Ligase (Acetyl-CoA Synthetase), Catalog Nos. 10 885 568 103 or 10 128 180 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.3.3.6

Specification
Appearance: Yellow lyophilizate
Activity (+37°C, enzymatically): ≥20 U/mg lyophilizate
Specific activity (enzymatically): ≥20 U/mg protein
Absorbance of the solution (20 U/ml):
A_{400}: ≤0.08
A_{500}: ≤0.04
A_{650}: ≤0.02
Contaminants:
Catalase: ≤12 U/U Acyl-CoA oxidase
Stability: At -15 to -25 °C within specification range for 12 months. Store dry in tightly sealed containers.

Adenosine Deaminase
from calf intestine, suspension

Cat. No.	Pack Size
10 153 460 103	custom fill

Will be supplied as "Adenosine Deaminase (ADA), Calf Intestine". Unit of Measure is "g".
For further processing only.

Application
Use Adenosine Deaminase for the deamination of adenosine analogs to the corresponding inosine analogs.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.5.4.4

Specification
Appearance: White suspension in ammonium sulfate
Specific activity: ≥200 U/mg protein
Protein (Biuret): ≥10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Adenosine Deaminase specific activity):
AMP deaminase: ≤0.01
Guanase: ≤0.01
Nucleoside phosphorylase: ≤0.01
Phosphatase, alkaline: ≤0.01
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months.

Alanine Aminotransferase (ALT) (GPT)
from pig heart, lyophilizate

Cat. No.	Pack Size
10 170 674 103	custom fill

Will be supplied as "GPT from Pig Heart". Unit of Measure is "kU". For further processing only.

Application
Use Alanine Aminotransferase for designing your calibrator/control reagent and for the synthesis of unnatural L-amino acids from α-keto acids.

Benefits
Rely on the proven diagnostic quality of this product.

EC 2.6.1.2

Specification
Appearance: Slightly yellow lyophilizate
pH value (c=10 mg/ml in water): 7.0-8.0
Activity (+25°C, L-alanine, α-oxoglutarate): ≥3U/mg lyophilizate
Activity (+37°C, ALT (ALAT/GPT)-kit): ≥4.8 U/mg lyophilizate
Contaminants (expressed as percentage of Alanine Aminotransferase activity):
Contaminating oxidases (FOX): ≤0.7
Glutamate dehydrogenase: ≤0.01
Aspartate Aminotransferase (AST/GOT): ≤0.135
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Alanine Amionotransferase (ALT) (GPT)
from pig heart, suspension

Cat. No.	Pack Size
10 153 443 103	custom fill

Will be supplied as "GPT from Pig Heart". Unit of Measure is "kU". For further processing only.

Application
Use Alanine Aminotransferase for designing your calibrator/control reagent and for the synthesis of unnatural L-amino acids from α-keto acids.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 2.6.1.2

Specification
Appearance: Slightly yellow suspension in ammonium sulfate, 3.2 mol/l

pH value: 5.5-6.5
Specific activity (+25 °C; L-alanine, α-ketoglutarate): ≥80 U/mg protein
Protein (Biuret): ≥10 mg/ml (standardized to 10±1 mg/ml)
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Alanine Aminotransferase activity):
Glutamate dehydrogenase: ≤0.01
Aspartate Aminotransferase (AST/GOT) : ≤0.03
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Alcohol Dehydrogenase
from yeast, lyophilizate

Dehydrogenase that catalyzes the interconversion of alcohols to the corresponding aldehydes.

Application
Use Alcohol Dehydrogenase in diagnostic tests for the determination of alcohol or aldehyde (formate).

Benefits
Rely on the proven diagnostic quality of this product.

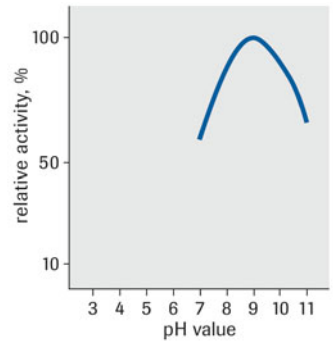
EC 1.1.1.1

Properties
Nomenclature: Alcohol:NAD^+ oxidoreductase
Molecular weight: 141 kD (pH 7.0)
Isoelectric point: 5.4-5.8
Michaelis constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 1.3 x 10^{-2} mol/l
NAD: 7.4 x 10^{-5} mol/l
Acetaldehyde: 7.8 x 10^{-4} mol/l
NADH: 1.1 x 10^{-5} mol/l
Inhibitor constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 4.3 x 10^{-2} mol/l
NAD: 6.1 x 10^{-4} mol/l
Acetaldehyde: 6.7 x 10^{-4} mol/l
NADH: 1.8 x 10^{-5} mol/l
Inhibitors:
-SH-reagents and heavy metals, such as derivatives, 4-chloromercuribenzoate, iodoacetic acid, N-substituted maleinimides, Hg^{2+}, Ag^+ and Cu^{2+}.
-Complexing agents, *e.g.,* o- phenanthroline, EDTA, oxalate.
-NAD analogs and NAD partial structures, *e.g.,* NADP, NADH, ADP, ADP-ribose.
-Substances, which react with enzyme bound NAD, *e.g.,* sulfite, hydroxylamine, cyanide.
-Substrate analogs, *e.g.,* fluoroethanol.
-Oxidizers, *e.g.,* H_2O_2 and aerial oxygen inactivate by oxidation of essential groups.
pH optimum: 9.0 (see figure)
Temperature dependence: See figure
pH stability: 6.0-8.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Alcohol dehydrogenase oxidizes primary alcohols. Isopropanol and secondary butanol are slowly oxidized, while higher secondary and

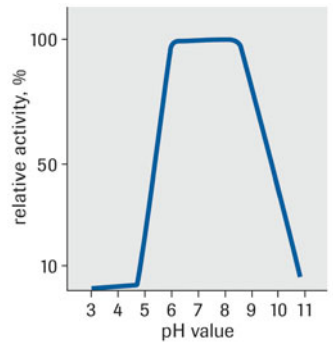
Cat. No.	Pack Size
11 452 541 103	custom fill

Will be supplied as "Alcohol Dehydrogenase, Yeast". Unit of Measure is "MU".

DRY ICE

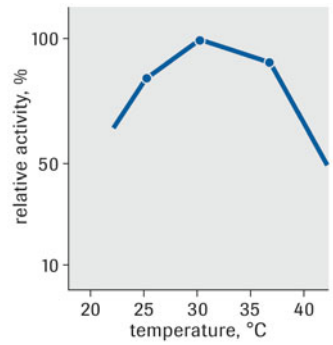


pH optimum



Incubation:
25°C, 120 min
pH 3.0 – 5.0:
citrate buffer, 0.2 mol/l
pH 6.0 – 8.0:
phosphate buffer,
0.2 mol/l
pH 9.0 –11.0:
glycine buffer, 0.2 mol/l
180 U ADH/ml

pH stability

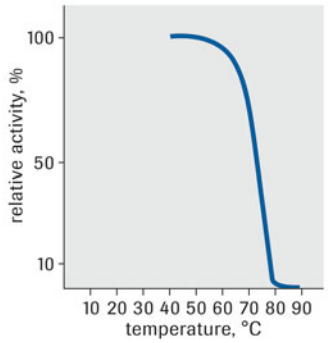


Temperature dependence

tertiary alcohols do not react. Numerous aldehydes are reduced in the reverse reaction. The enzyme does not react with NADP.
Remarks:Alcohol dehydrogenase tends to show turbidity in solution at +37°C storage. Modified Alcohol dehydrogenase shows no turbidity for at least 4 weeks in solution at +37°C.

Specification

Appearance: White lyophilizate (50 mg lyophilizate contain approximately 30 mg enzyme protein,15 mg sucrose, 5 mg phosphate)
pH value (c=50 mg/ml in water): 7.0-8.0
Activity (+25°C, ethanol): No limit
Specific activity: ≥400 U/mg (protein)
Protein (Biuret): ≥0.5 mg/mg lyophilizate
Contaminants (expressed as percentage of Alcohol Dehydrogenase activity):
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase ≤0.01
Stability: At -15 to -25°C within specification range for 12 months. Store dry.



Incubation:
10 min
$(NH_4)_2SO_4$, 3.2 mol/l;
pH 6.0
18 090 U ADH/ml

Thermal stability

For further processing only.

Alcohol Dehydrogenase, chemically modified

from yeast, lyophilizate

Dehydrogenase that catalyzes the interconversion of alcohols to the corresponding aldehydes.

Application

Use Alcohol Dehydrogenase in diagnostic tests for the determination of alcohol or aldehyde (formate).

Benefits

- Take advantage of the enhanced liquid stability of this enzyme.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.1

Properties

Nomenclature: Alcohol:NAD^+ oxidoreductase
Molecular weight: 141 kD (pH 7.0)
Isoelectric point: 5.4-5.8
Michaelis constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 1.3 x 10^{-2} mol/l
NAD: 7.4 x 10^{-5} mol/l
Acetaldehyde: 7.8 x 10^{-4} mol/l
NADH: 1.1 x 10^{-5} mol/l
Inhibitor constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 4.3 x 10^{-2} mol/l
NAD: 6.1 x 10^{-4} mol/l
Acetaldehyde: 6.7 x 10^{-4} mol/l
NADH: 1.8 x 10^{-5} mol/l
Inhibitors:
-SH-reagents and heavy metals, such as derivatives, 4-chloromercuribenzoate, iodoacetic acid, N-substituted maleinimides, Hg^{2+}, Ag^+ and Cu^{2+}.
-Complexing agents, *e.g.,* o- phenanthroline, EDTA, oxalate.
-NAD analogs and NAD partial structures, *e.g.,* NADP, NADH, ADP, ADP-ribose.
-Substances, which react with enzyme bound NAD, *e.g.,* sulfite, hydroxylamine, cyanide.
-Substrate analogs, *e.g.,* fluoroethanol.
-Oxidizers, *e.g.,* H_2O_2 and aerial oxygen inactivate by oxidation of essential groups.

Cat. No.	Pack Size
11 644 980 103	custom fill

Will be supplied as "Alcohol Dehydrogenase, Yeast, Modified".
Unit of Measure is "MU".
For further processing only.

pH optimum: 9.0 (see figure)
Temperature dependence: See figure
pH stability: 6.0-8.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Alcohol dehydrogenase oxidizes primary alcohols. Isopropanol and secondary butanol are slowly oxidized, while higher secondary and tertiary alcohols do not react. Numerous aldehydes are reduced in the reverse reaction. The enzyme does not react with NADP.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c = 50 mg/ml)
pH value: 6.5-8.0
Activity (+25°C, ethanol): ≥25 U/mg lyophilizate
Contaminants (expressed as percentage of Alcohol Dehydrogenase activity):
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase:≤0.01
Stability: At +2 to +8°C within specification range for 12 months.

Alcohol Dehydrogenase
from yeast, suspension

Cat. No.	Pack Size
11 531 034 103	custom fill

Will be supplied as "ADH-Y, As, new". Unit of Measure is "g".
For further processing only.

Dehydrogenase that catalyzes the interconversion of alcohols to the corresponding aldehydes.

Application
Use Alcohol Dehydrogenase in diagnostic tests for the determination of alcohol or aldehyde (formate).

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.1

Properties
Nomenclature: Alcohol:NAD^+ oxidoreductase
Molecular weight: 141 kD (pH 7.0)
Isoelectric point: 5.4-5.8
Michaelis constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 1.3 x 10^{-2} mol/l
NAD: 7.4 x 10^{-5} mol/l
Acetaldehyde: 7.8 x 10^{-4} mol/l
NADH: 1.1 x 10^{-5} mol/l
Inhibitor constants (Phosphate buffer, pH 7.15, +25°C):
Ethanol: 4.3 x 10^{-2} mol/l
NAD: 6.1 x 10^{-4} mol/l
Acetaldehyde: 6.7 x 10^{-4} mol/l
NADH: 1.8 x 10^{-5} mol/l
Inhibitors:
-SH-reagents and heavy metals, such as derivatives, 4-chloromercuribenzoate, iodoacetic acid, N-substituted maleinimides, Hg^{2+}, Ag^+ and Cu^{2+}.
-Complexing agents, *e.g.,* o- phenanthroline, EDTA, oxalate.
-NAD analogs and NAD partial structures, *e.g.,* NADP, NADH, ADP, ADP-ribose.
-Substances, which react with enzyme bound NAD, *e.g.,* sulfite, hydroxylamine, cyanide.
-Substrate analogs, *e.g.,* fluoroethanol.
-Oxidizers, *e.g.,* H_2O_2 and aerial oxygen inactivate by oxidation of essential groups.
pH optimum: 9.0 (see figure)

Temperature dependence: See figure
pH stability: 6.0-8.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Alcohol dehydrogenase oxidizes primary alcohols. Isopropanol and secondary butanol are slowly oxidized, while higher secondary and tertiary alcohols do not react. Numerous aldehydes are reduced in the reverse reaction. The enzyme does not react with NADP.
Remark: Alcohol dehydrogenase tends to show turbidity in solution at +37°C storage.
Modified Alcohol dehydrogenase shows no turbidity for at least 4 weeks in solution at +37°C.

Specification

Appearance: White to yellow-brown crystalline suspension in ammonium sulfate solution, 3.2 mol/l, pH approximately 6.5
pH value: 6.0-7.0
Activity: 9,000 to 18,000 U/ml
Specific activity: ≥300 U/mg (protein)
Protein (Biuret): 30±3 mg/ml lyophilizate
Contaminants (expressed as percentage of Alcohol Dehydrogenase activity):
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
Stability: At +2 to +8°C within specification range for 9 months. Store under nitrogen.

Aldehyde Dehydrogenase
from yeast, lyophilizate

Dehydrogenase that catalyzes the oxidation of aldehydes using $NAD(P)^+$ as acceptor.

Application

Use Aldehyde Dehydrogenase in diagnostic tests that use an NADH/NADPH recycling system.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.2.1.5

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=20 mg/ml)
Activity (+25°C, acetaldehyde): ≥2.0 U/mg lyophilizate
Specific activity: ≥20 U/mg protein
Protein (Biuret): No limit (approximately 10%)
Contaminants (expressed as percentage of Aldehyde Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
Lactate dehydrogenase: ≤0.01
"NADH oxidase": ≤0.01
"NADPH oxidase": ≤0.01
Stability: At +2 to +8°C within specification range for 12 months. Store dry. Store under nitrogen.

Cat. No.	Pack Size
10 145 947 103	custom fill

Will be supplied as "Aldehyde Dehydrogenase from Yeast". Unit of Measure is "kU".
For further processing only.

Aldose 1-Epimerase (Mutarotase)
from pig kidney, suspension

Enzyme for mutarotation of sugars.

Application
Use Aldose 1-Epimerase (Mutarotase) in diagnostic tests for the determination glucose anomers.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 5.1.3.3

Specification
Appearance: White suspension in ammonium sulfate, 3.2 mol/l, pH approximately 6
pH value: 5.5-6.5
Specific activity (+25°C, α-D-glucose): ≥5,000 U/mg protein
Protein (Biuret): 5±0.5 mg/ml
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
10 152 331 103	custom fill

Will be supplied as "Mutarotase from Hog Kidney". Unit of Measure is "MU".
For further processing only.

Ascorbate Oxidase

from *Cucurbita* species, lyophilizate

Oxidoreductase that oxidizes ascorbic acid to dehydroascorbate.

Application

Use Ascorbate Oxidase in a variety of diagnostic tests to eliminate the interference of ascorbic acid, since ascorbic acid interferes with the Trinder reaction that is widely used for the colorimetric determination of analytes. It is useful in liquid as well as dry chemistry test, *e.g.,* for the determination of uric acid, lactate, creatine kinase or transaminases.

Benefits

- Rely on the proven diagnostic quality of this product.

EC 1.10.3.3

Properties

Nomenclature: L-ascorbate:oxygen oxidoreductase
Molecular weight: Approximately 140 kD
Isoelectric point: 5.0-6.0
Michaelis constant (Phosphate buffer, pH 5.6, +25°C):
L-ascorbate: 3 x 10^{-4} mol/l
Inhibitors: 4-chloromercuribenzoate, CN^-, Na_2S, diethyl-dithiocarbamate, 8-hydroxyquinoline, K-ethylxanthate
pH optimum: 5.6-7.0 (see figure)
Temperature dependence: See figure
pH stability: 6.5-9.0 (see figure)
Thermal stability: Up to +70°C (see figure)
Stability of the lyophilizate: Stable at +35°C for at least 3 weeks (see figure).
Stability in solution: See figure
Specificity: Several analogs of ascorbate react.
Remark: A decrease in activity of approximately 10% may occur.

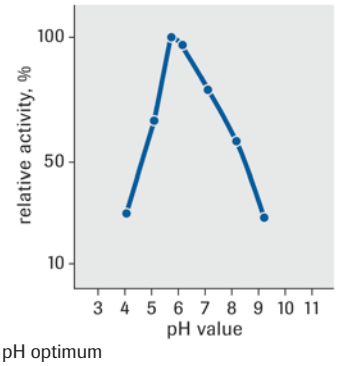
Specification

Appearance: Turquoise lyophilizate
Solubility: Clear, slightly turquoise solution in water (c=50 mg/ml)
pH value (c=50 mg/ml in water): 7.0-8.0
Activity (+25°C, L-ascorbate): ≥170 U/mg lyophilizate
Specific activity (+25°C): ≥1,700 U/mg protein
Activity (+37°C, L-ascorbate): ≥180 U/mg lyophilizate
Specific activity (+37°C): ≥1,800 U/mg protein
Protein (BCA): 0.07-0.14 mg/mg lyophilizate
Contaminants (+25°C; expressed as percentage of Ascorbate Oxidase activity):
Catalase: ≤0.2
Aspartate aminotransferase (AST/GOT): No limit
Alanine aminotransferase (ALT/GPT): No limit
Peroxidase: ≤0.005
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Keep tightly sealed.

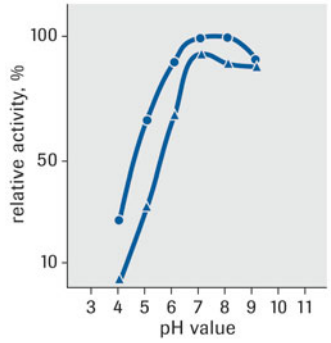
Cat. No.	Pack Size
10 199 605 103	custom fill

Will be supplied as "Ascorbate Oxidase from Cucurbita species". Unit of Measure is "kU".

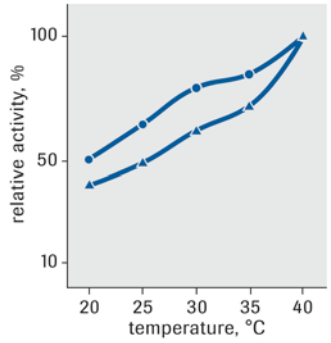
DRY ICE



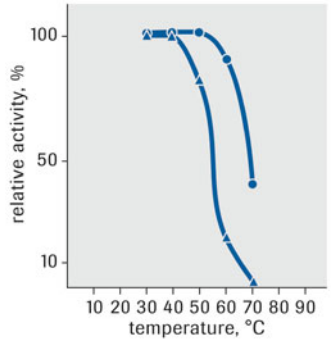
pH optimum



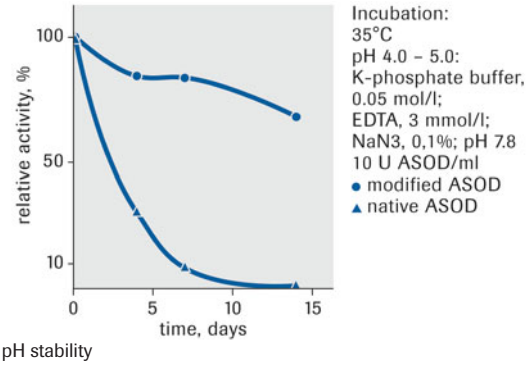
pH stability



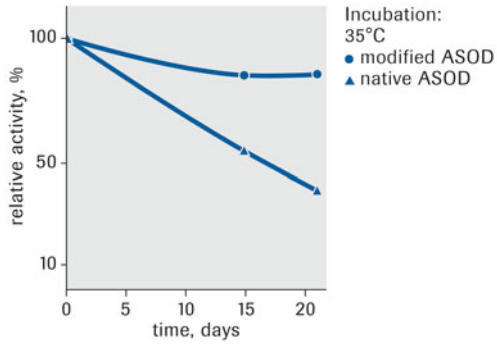
Thermal stability



pH optimum



pH stability



Thermal stability

For further processing only.

Ascorbate Oxidase

from *Cucurbita* species, poor of Aspartate aminotransferase (AST/GOT), lyophilizate

Oxidoreductase that oxidizes ascorbic acid to dehydroascorbate.

Application

Use Ascorbate Oxidase in a variety of diagnostic tests to eliminate the interference of ascorbic acid, since ascorbic acid interferes with the Trinder reaction that is widely used for the colorimetric determination of analytes. It is useful in liquid as well as dry chemistry test, *e.g.,* for the determination of uric acid, lactate, creatine kinase or transaminases.

Benefits

- Rely on the tested deficiency of aspartate transaminase.
- Rely on the proven diagnostic quality of this product.

EC 1.10.3.3

Properties

Nomenclature: L-ascorbate:oxygen oxidoreductase
Molecular weight: Approximately 140 kD
Isoelectric point: 5.0-6.0
Michaelis constant (Phosphate buffer, pH 5.6, +25°C):
L-ascorbate: 3 x 10^{-4} mol/l
Inhibitors: 4-chloromercuribenzoate, CN^-, Na_2S, diethyl-dithiocarbamate, 8-hydroxyquinoline, K-ethylxanthate
pH optimum: 5.6-7.0 (see figure)
Temperature dependence: See figure
pH stability: 6.5-9.0 (see figure)

Cat. No.	Pack Size
11 136 364 103	custom fill

Will be supplied as "Ascorbate Oxidase GOT-deficient". Unit of Measure is "MU".

DRY ICE

For further processing only.

Thermal stability: Up to +70°C (see figure)
Stability of the lyophilizate: Stable at +35°C for at least 3 weeks (see figure).
Stability in solution: See figure
Specificity: Several analogs of ascorbate react.
Remark: A decrease in activity of approximately 10% may occur.

Specification

Appearance: Turquoise lyophilizate
Solubility: Clear, slightly turquoise solution in water (c=50 mg/ml)
pH value (c=50 mg/ml in water): 7.0-8.0
Activity (+25°C, L-ascorbate): ≥170 U/mg lyophilizate
Specific activity (+25°C): ≥1,700 U/mg protein
Activity (+37°C, L-ascorbate): ≥180 U/mg lyophilizate
Specific activity (+37°C): ≥1,800 U/mg protein
Protein (BCA): 0.08-0.14 mg/mg lyophilizate
Contaminants (+25°C, expressed as percentage of Ascorbate Oxidase activity):
Catalase: ≤0.2
Aspartate aminotransferase (AST/GOT): ≤0.0003
Alanine aminotransferase (ALT/GPT): ≤0.0005
Contaminating oxidases (FOX): ≤0.0002
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Keep tightly sealed.

Ascorbate Oxidase, chemically modified
from *Cucurbita* species, lyophilizate

Cat. No.	Pack Size
11 558 668 103	custom fill

Will be supplied as "AOD, modified". Unit of Measure is "MU". For further processing only.

Oxidoreductase that oxidizes ascorbic acid to dehydroascorbate.

Application

Use Ascorbate Oxidase, chemically modified, in a variety of diagnostic tests to eliminate the interference of ascorbic acid, since ascorbic acid interferes with the Trinder reaction that is widely used for the colorimetric determination of analytes. It is useful in liquid as well as dry chemistry test, *e.g.,* for the determination of uric acid, lactate, creatine kinase or transaminases.

Benefits

- Take advantage of the improved stability in liquid reagents.
- Rely on the proven diagnostic quality of this product.

EC 1.10.3.3

Properties

Nomenclature: L-ascorbate:oxygen oxidoreductase
Molecular weight: Approximately 140 kD
Isoelectric point: 5.0-6.0
Michaelis constant (Phosphate buffer, pH 5.6, +25°C):
L-ascorbate: 3 x 10^{-4} mol/l
Inhibitors: 4-chloromercuribenzoate, CN^-, Na_2S, diethyl-dithiocarbamate, 8-hydroxyquinoline, K-ethylxanthate
pH optimum: 5.6-7.0 (see figure)
Temperature dependence: See figure
pH stability: 6.5-9.0 (see figure)
Thermal stability: Up to +70°C (see figure)
Stability of the lyophilizate: Stable at +35°C for at least 3 weeks (see figure).
Stability in solution: See figure
Specificity: Several analogs of ascorbate react.
Remark: The modified enzyme is especially suited for liquid stable applications with extended shelf life requirements.

Specification
Appearance: Turquoise lyophilizate
Solubility: Clear, slightly turquoise solution in water (c=50 mg/ml)
pH value (c=50 mg/ml in water): 7.2-8.2
Activity (+25°C, L-ascorbate): ≥120 U/mg lyophilizate
Specific activity (+25°C): ≥1,200 U/mg protein
Activity (+37°C, L-ascorbate): ≥180 U/mg lyophilizate
Specific activity (+37°C): ≥1,800 U/mg protein
Protein (BCA): 0.04-0.10 mg/mg lyophilizate
Contaminants (+25°C, expressed as percentage of Ascorbate Oxidase activity):
Catalase: ≤0.2
Glutamate oxalacetate transaminase (AST): ≤0.0003
Glutamate pyruvate transaminase (ALT): ≤0.0005
Contaminating oxidases (FOX): ≤0.0002
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Keep tightly sealed.

Aspartate Aminotransferase (AST) (GOT)
from pig heart, lyophilizate

Cat. No.	Pack Size
10 170 666 103	custom fill

Will be supplied as "GOT from Pig Heart". Unit of Measure is "kU". For further processing only.

Application
Use Aspartate Aminotransferase for designing your calibrator/control reagent and for the synthesis of unnatural L-amino acids from α-keto acids.

Benefits
- Rely on the proven diagnostic quality of this product.

EC 2.6.1.1

Specification
Appearance: Slightly yellow lyophilizate
pH value (c=10 mg/ml in water): 7.0-8.0
Activity (+37°C, AST (ASAT/GOT)-kit): ≥45 U/mg lyophilizate
Contaminants (expressed as percentage of Aspartate Aminotransferase activity):
Contaminating oxidases (FOX): ≤0.7
Glutamate dehydrogenase: ≤0.01
Alanine Aminotransferase (ALT/GPT) : ≤0.01
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
Oxaloacetate decarboxylase: ≤0.01
SDV free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Aspartate Aminotransferase (AST) (GOT)
from pig heart, suspension

Cat. No.	Pack Size
10 153 354 103	custom fill

Will be supplied as "GOT from Pig Heart". Unit of Measure is "MU". For further processing only.

Application
Use Aspartate Aminotransferase for designing your calibrator/control reagent and for the synthesis of unnatural L-amino acids from α-keto acids.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 2.6.1.1

Specification

Appearance: Yellow suspension in ammonium sulfate
pH value: 5.5-6.5
Specific activity (+25°C; L-aspartate, α-ketoglutarate): ≥200 U/mg protein
Protein: ≥10 mg/ml (standardized to 10±1 mg/ml)
Ammonium sulphate: 3.2 0.2 mol/l
Contaminants (expressed as percentage of Aspartate Aminotransferase activity):
Glutamate dehydrogenase: ≤0.01
Alanine Aminotransferase (ALT/GPT) : ≤0.01
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
Oxaloacetate decarboxylase:≤0.01
SDV free: Corresponds
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months.

N-Carbamoylsarcosine Amidase

from *E.coli* overproducer, lyophilizate

Hydrolase that catalyzes the interconversion of N-carbamoylsarcosine to sarcosine.

Application

Use N-Carbamoylsarcosine Amidase in diagnostic tests for the determination of creatinine in combination with Creatinine Deaminase Catalog No. 11 330 764 103, N-Methylhydantoinase (ATP-hydrolysing), Catalog No. 11 288 555 103, and Sarcosine Oxidase, Catalog No. 11 378 856 103.

Benefits

Rely on the proven diagnostic quality of this product.

Cat. No.	Pack Size
11 248 847 103	custom fill

Will be supplied as "N-Carbamoyl-sarcosine Hydrolase". Unit of Measure is "kU".

DRY ICE

For further processing only.

EC 3.5.1.59

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 7.3-8.3
Activity (+25°C, carbamoylsarcosine): 0.80-1.30 U/mg lyophilizate
Protein (Biuret): 30-50 mg/100 mg lyophilizate
Contaminants (expressed as percentage of Carbamoylsarcosine Amidase activity):
Creatinase: ≤0.013
Creatininase: ≤0.01
Catalase: ≤30
Uricase: ≤0.01
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Protect from light.

Cholesterol Esterase, Grade I
from *Pseudomonas species*, lyophilizate

Hydrolase that splits fatty acids from sterols.

Application
Use Cholesterol Esterase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Oxidase, Catalog Nos. 10 634 522 103, 10 129 054103 or 11 479 709 103.

Benefits
- Use this enzyme for you liquid applications.
- Rely on the proven diagnostic quality of this product.

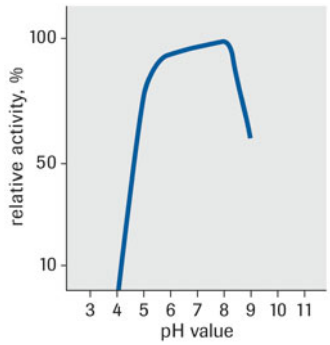
EC 3.1.1.13

Properties
Nomenclature: Sterol-ester acylhydrolase
Molecular weight: ~129 kD
Isoelectric point: 4.5
Michaelis constant (Phosphate buffer, pH 7.5):
Cholesterol oleate: 7 x 10^{-5} mol/l
Inhibitors: Heavy metals such as Cu^{2+}, Ag^{+}, Zn^{2+}
Activators: Detergents
pH optimum: 6.0-8.0; (maximum at pH 7.6) (see figure)
Temperature dependence: Not possible to determine under assay conditions due to turbidity of Thesit at temperatures above +27°C.
pH stability: 6.0-6.5 (see figure)
Thermal stability: Below +20°C (see figure)
Specificity: Cholesterol esterase is an enzyme of lipid metabolism and gives complete cleavage of all serum cholesterol esters.
Remark: This Cholesterol esterase is especially suited for liquid stable applications with extended shelf life requirements.

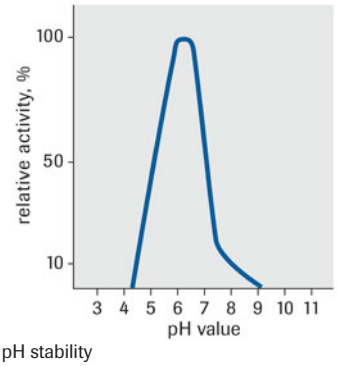
Specification
Appearance: Brownish lyophilizate
Solubility: Clear, brown solution in water (c=50 mg/ml)
pH value (c=50 mg/ml in water): 7.0-8.0
Activity (+25°C, cholesterol oleate): ≥100 U/mg lyophilizate
Specific Activity: ≥100 U/mg protein
Protein (Biuret): No limit
Contaminants (expressed as percentage of Cholesterol Esterase activity):
ATPase: ≤0.005
Catalase: ≤1.00
Glycerokinase: ≤0.001
Glucose oxidase: ≤0.001
Hexokinase: ≤0.005
"NADH oxidase": ≤0.001
Uricase: ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
11 520 857 103	custom fill

Will be supplied as "CE, Ps.species, Lyo., SQ". Unit of Measure is "MU".

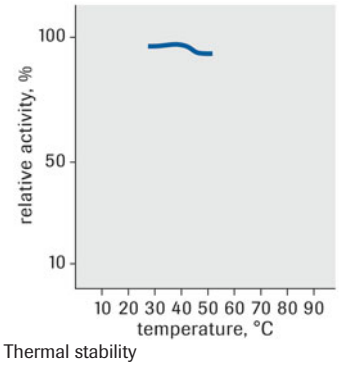


pH optimum



Incubation:
25°C, 25 h
K-phosphate buffer,
0.7 mol/l
42.9 U CE/ml

pH stability



Incubation:
10 min
K-phosphate buffer,
0.05 mol/l;
pH 6.5
18 U CE/ml

Thermal stability

For further processing only.

Cholesterol Esterase, chemically modified
from *Pseudomonas* species, lyophilizate

Hydrolase that splits fatty acids from sterols.

Cat. No.	Pack Size
11 641 735 103	custom fill

Will be supplied as "Cholesterol Esterase Modified". Unit of Measure is "MU".
For further processing only.

Application
Use Cholesterol Esterase, chemically modified in diagnostic tests for the determination of cholesterol in combination with Cholesterol Oxidase, Catalog Nos. 11 479 709 103, 10 634 522 103 or 10 129 054.

Benefits
- Take advantage of the enhanced stability of this enzyme in liquid reagents.
- Rely on the proven diagnostic quality of this product.

EC 3.1.1.13

Properties
Nomenclature: Sterol-ester acylhydrolase
Molecular weight: ~129 kD
Isoelectric point: 4.5
Michaelis constant (Phosphate buffer, pH 7.5):
Cholesterol oleate: 7 x 10^{-5} mol/l
Inhibitors: Heavy metals such as Cu^{2+}, Ag^{+}, Zn^{2+}
Activators: Detergents
pH optimum: 6.0-8.0; (maximum at pH 7.6) (see figure)
Temperature dependence: Not possible to determine under assay conditions due to turbidity of Thesit at temperatures above +27°C.
pH stability: 6.0-6.5 (see figure)
Thermal stability: Below +20°C (see figure)
Specificity: Cholesterol esterase is an enzyme of lipid metabolism and gives complete
cleavage of all serum cholesterol esters.

Specification
Appearance: Brownish lyophilizate
Solubility: Clear, brown solution in water (c=50 mg/ml)
pH value (c=50 mg/ml, in water): 7.0-8.0
Activity (+25°C, cholesterol oleate): ≥10 U/mg lyophilizate
Specific Activity: ≥100 U/mg protein
Volume Activity: For information only
Contaminants (expressed as percentage of Cholesterol Esterase activity):
ATPase: ≤0.005
Catalase: ≤1.00
Glycerokinase: ≤0.001
Hexokinase: ≤0.005
"NADH oxidase": ≤0.001
Uricase: ≤0.005
NaCl: 3±0.2 mol/l
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cholesterol Esterase, Grade II
from *Pseudomonas* species, lyophilizate

Hydrolase that splits fatty acids from sterols.

Application
Use Cholesterol Esterase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Oxidase, Catalog Nos. 10 634 522 103, 10 129 054 103 or 11 479 709 103.

Benefits
- Use this enzyme for your dry chemistry applications.
- Rely on the proven diagnostic quality of this product.

Cat. No.	Pack Size
11 015 923 103	custom fill

Will be supplied as "Cholesterol Esterase from Pseudom.species".
Unit of Measure is "MU".
For further processing only.

EC 3.1.1.13

Properties
Nomenclature: Sterol-ester acylhydrolase
Molecular weight: ~129 kD
Isoelectric point: 4.5
Michaelis constant (Phosphate buffer, pH 7.5):
Cholesterol oleate: 7 x 10^{-5} mol/l
Inhibitors: Heavy metals such as Cu^{2+}, Ag^{+}, Zn^{2+}
Activators: Detergents
pH optimum: 6.0-8.0; (maximum at pH 7.6) (see figure)
Temperature dependence: Not possible to determine under assay conditions due to turbidity of Thesit at temperatures above +27°C.
pH stability: 6.0-6.5 (see figure)
Thermal stability: Below +20°C (see figure)
Specificity: Cholesterol esterase is an enzyme of lipid metabolism and gives complete cleavage of all serum cholesterol esters.

Specification
Appearance: Slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=50 mg/ml)
pH value (c=50 mg/ml in water): 7.0-8.0
Protein (Biuret): 0.14-0.20 mg/mg lyophilizate
Activity (+25°C, cholesterol oleate): ≥25 U/mg lyophilizate
Specific Activity: ≥100 U/mg protein
Contaminants (expressed as percentage of Cholesterol Esterase activity):
ATPase: ≤0.005
Catalase: ≤200 U/mg lyophilizate
Glycerokinase: ≤0.001
GOD: ≤0.001
Hexokinase: ≤0.005
"NADH oxidase": ≤0.005
Uricase: ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cholesterol Esterase
from *Candida cylindracea*, lyophilizate

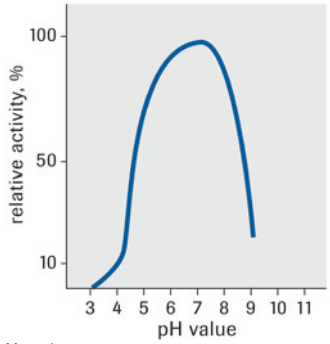
Hydrolase that splits fatty acids from sterols.

Application
Use Cholesterol Esterase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Oxidase, Catalog Nos. 10 634 522 103, 10 129 054 103 or 11 479 709 103.

Benefits
Rely on the proven diagnostic quality of this product.

Cat. No.	Pack Size
10 129 046 103	custom fill

Will be supplied as "Cholesterol Esterase, Candida cylindracea".
Unit of Measure is "MU".

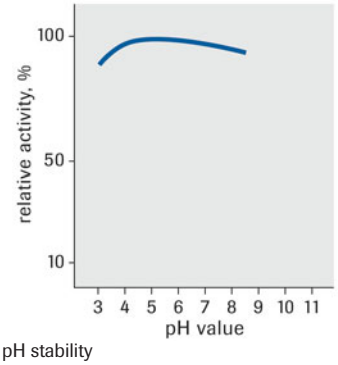


pH optimum

EC 3.1.1.13

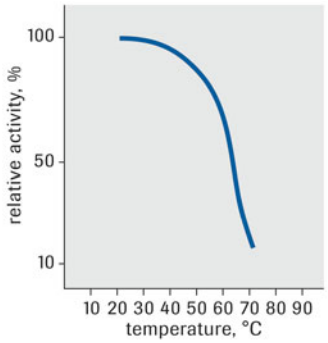
Specification
Appearance: Almost white lyophilizate
Solubility: Clear, colorless solution in phosphate buffer, 0.05 mol/l, pH 6.0 (c=10 mg/ml)
pH value: 5.5-6.5
Activity (+25°C; cholesterol oleate): ≤10.5 U/mg lyophilizate
Protein (Lowry): 0.20-0.30 mg/mg lyophilizate
Contaminants (expressed as percentage of Cholesterol Esterase activity):

ATPase: ≤0.005
Glucose oxidase: ≤0.001
Glycerokinase: ≤0.001
Hexokinase: ≤0.005
Catalase: ≤1 U/mg lyophilizate
"NADH oxidase": ≤0.005
Proteases: No limit
Uricase: ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



Incubation:
25°C, 20 h
pH 3.0 – 5.0:
Na-acetate buffer,
0.7 mol/l
pH 4.0 – 8.2:
K-phosphate buffer,
0.7 mol/l
48.7 U CE/ml

pH stability



Incubation:
10 min
K-phosphate buffer,
0.05 mol/l;
pH 6.5
48.7 U CE/ml

Thermal stability

For further processing only.

Cholesterol Esterase
from *Candida cylindracea*, solution

Cat. No.	Pack Size
10 262 609 103	custom fill

Will be supplied as "Cholesterol Esterase, Candida cylindracea".
Unit of Measure is "MU".

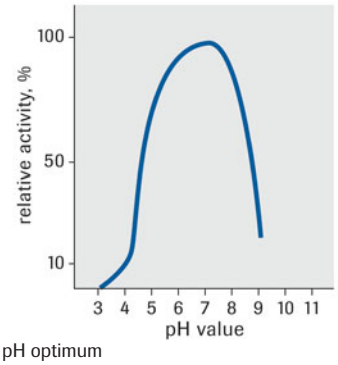
Hydrolase that splits fatty acids from sterols.

Application
Use Cholesterol Esterase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Oxidase, Catalog Nos. 10 634 522 103, 10 129 054 103 or 11 479 709 103. Apply this ready-to-use enzyme directly in your diagnostic test.

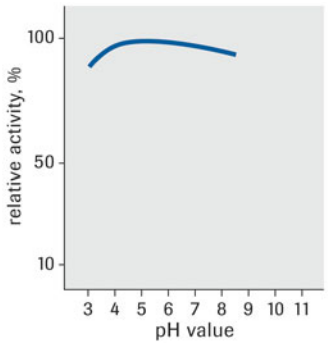
Benefits
Rely on the proven diagnostic quality of this product.

EC 3.1.1.13

Specification
Appearance: Clear to turbid, brownish-yellow solution in NaCl
pH value: 5.7-6.3
Specific activity (+25°C; cholesterol oleate): ≥26 U/mg
Protein (Lowry): ≥2 mg/ml
NaCl (chloride meter): 3±0.2 mol/l
Contaminants (expressed as percentage of Cholesterol Esterase activity):
ATPase: ≤0.005
Glucose oxidase: ≤0.001
Glycerokinase: ≤0.001
Hexokinase: ≤0.005
Catalase: ≤200 U/mg
"NADH oxidase": ≤0.005
Uricase: ≤0.005



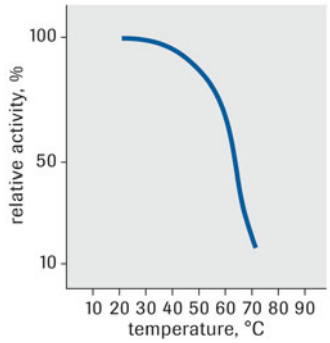
pH optimum



Incubation:
25°C, 20 h
pH 3.0 – 5.0:
Na-acetate buffer,
0.7 mol/l
pH 4.0 – 8.2:
K-phosphate buffer,
0.7 mol/l
48.7 U CE/ml

Stability: At +2 to +8°C within specification range for 12 months.

pH stability



Incubation:
10 min
K-phosphate buffer,
0.05 mol/l;
pH 6.5
48.7 U CE/ml

Thermal stability

For further processing only.

Cholesterol Oxidase

from *Brevibacterium* species, expressed in *E.coli*, lyophilizate

Oxidoreductase that catalyzes the interconversion of cholesterol to cholest-4-en-3-one.

Cat. No.	Pack Size
11 479 709 103	custom fill

Will be supplied as "ChOD, Brevibacterium rec.". Unit of Measure is "MU".

DRY ICE

Application

Use Cholesterol Oxidase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Esterase, Catalog Nos. 10 129 046 103, 10 262 609 103, 11 015 923 103, 11 520 857 103 or 11 641 735 103.

Benefits

Rely on the proven diagnostic quality of this product.

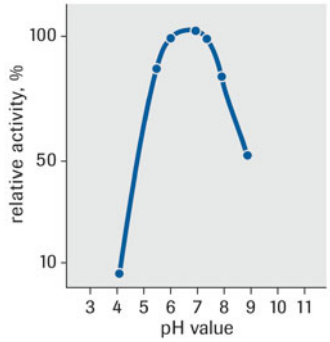
EC 1.1.3.6

Properties

Nomenclature: Cholesterol:oxygen oxidoreductase
Molecular weight: 60 kD (native and SDS)
Isoelectric point: ~5.0
Michaelis constant (Phosphate buffer, 0.5 mol/l, pH 7.5; +25°C):
Cholesterol: 1 x 10^{-4} mol/l
Inhibitors: Hg^{2+}, $ZnCl_2$, SDS
Activators: Non ionic detergents
pH optimum: 5.5-8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.0-10.0 (see figure)
Thermal stability: Up to +55°C (see figure)
Storage and Stability: No decrease in activity over 6 weeks at +35°C (see figure)
Specificity:
cholesterol 100%
pregnenolon 52%
stigmasterol 17%
dehydroandrosterone 0.5%
androsterone 0%
estradiol 0%
cholate 0%

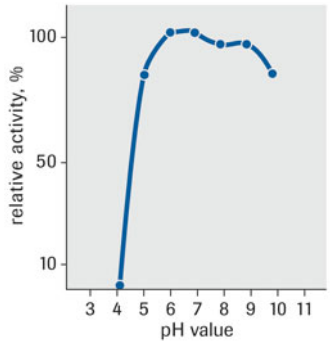
Specification

Appearance: Yellow lyophilizate
Solubility: Clear, yellowish solution in water (c=10 mg/ml)



pH 4.0:
citrate buffer, 0.5 mol/l
pH 5.5 – 8.0:
phosphate buffer,
0.5 mol/l;
pH 9.0:
glycine buffer,
0.5 mol/l
0.22 U CO/ml

pH optimum



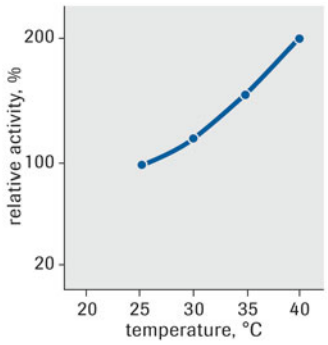
Incubation:
25°C, 24 h
pH 4.0 – 5.0:
citrate buffer, 0.5 mol/l
pH 5.5 – 8.0:
phosphate buffer,
0.5 mol/l
pH 9.0 –10.0:
glycine buffer,
0.5 mol/l
3 U CO/ml

pH stability

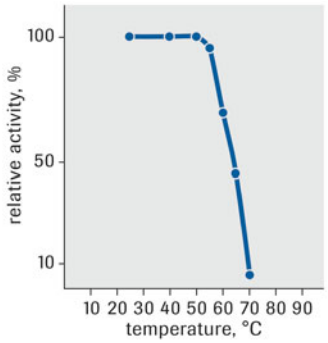
pH value: 6.0-7.0
Protein (Biuret): 0.1-0.3 mg/mg lyophilizate
Activity (+25°C, cholesterol): 10-20 U/mg lyophilizate
Contaminants (expressed as percentage of Cholesterol Oxidase activity):
Catalase: ≤6.0
Glucose oxidase: ≤0.01
"NADH oxidase": ≤0.01
Uricase: ≤0.01
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Protect from light.

Literature

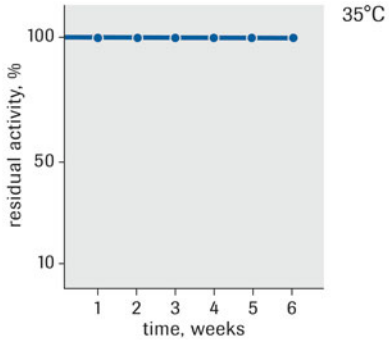
1) T. Ohta, K. Fujishiro, K. Yamaguchi, Y. Tamura, K. Aisaka, T. Unajima, M. Hasegawa, Gene ***103***, 93 (1991)
2) A. Vrielink, L.F. Lloyd, D.M. Blow, J. Mol. Biol. ***219***, 533 (1991)
3) K. Fujishiro, T. Ohta, M. Hasegawa, K. Yamaguchi, T. Mizukami, T. Uwajima, Biochem. Biophys. Res. Comm. ***172***, 721 (1990)



Temperature dependence



Thermal stability



Stability of the lyophilizate

For further processing only.

Cholesterol Oxidase
from *Nocardia erythropolis*, lyophilizate

Oxidoreductase that catalyzes the interconversion of cholesterol to cholest-4-en-3-one.

Application

Use Cholesterol Oxidase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Esterase, Catalog Nos. 10 129 046 103, 10 262 609 103, 11 015 923 103, 11 520 857 103 or 11 641 735 103.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.1.3.6

Cat. No.	Pack Size
10 129 054 103	custom fill

Will be supplied as "Cholesterol Oxidase, Nocardia erythropolis". Unit of Measure is "MU".

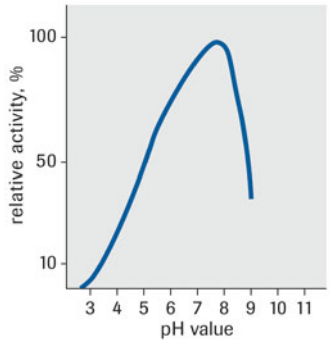
DRY ICE

Properties

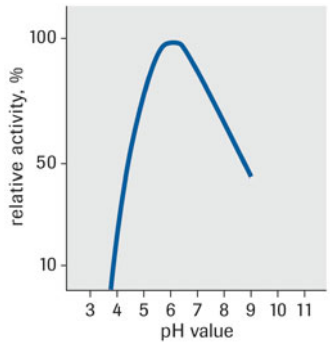
Nomenclature: Cholesterol:oxygen oxidoreductase
Molecular weight: ~59 kD
Isoelectric point: 4.85
Michaelis constants (Cholesterol):
Phosphate buffer, pH 7.0: 1 x 10^{-6} mol/l
Triton X-100/isopropanol, pH 7.0: 7 x 10^{-6} mol/l
Inhibitors: $ZnCl_2$, Brij 35, Tween 40, Tween 60, Hg^{2+}, GSH, sodium dodecyl sulfate, laurylbenzenesulfonate
Activators: Hydroxypolyethoxydodecane, Triton X-100, DOC
pH optimum: 7.0-8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Cholesterol (100%), b-cholestanol, pregnenolone, b-sitosterol and stigmasterol react as substrates (65-70%). Dehydroisoandrosterone and ergosterol show 5% relative activity. Androsterone, testosterone, β-estradiol, vitamin D3, cholic acid and cholesterol acetate do not react.

Specification

Appearance: Yellow-brown lyophilizate
Solubility: Clear, yellowish solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 5.5-6.5
Activity (+25°C, cholesterol): ≥2.5 U/mg lyophilizate
Protein (Lowry): 0.05-0.12 mg/mg lyophilizate
Contaminants (expressed as percentage of Cholesterol Oxidase activity):
Catalase: ≤6.0
Cholesterol esterase: No limit
Glucose oxidase: ≤0.01
"NADH oxidase": ≤0.01
Uricase: ≤0.01
Stability: At -15 to -25°C within specification range for 15 months. Store dry.

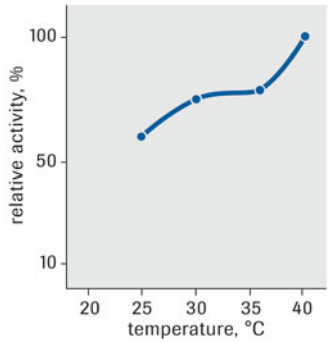


pH optimum

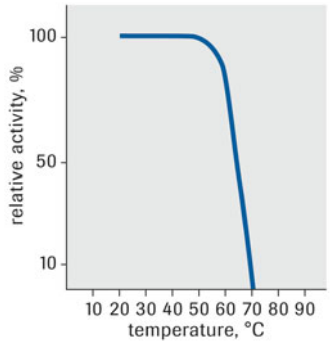


Incubation:
25°C, 25 h
pH 4.2– 8.8:
K-phosphate buffer,
0.5 mol/l
10.9 U CO/ml

pH stability



Temperature dependence



Incubation:
10 min
K-phosphate buffer,
50 mmol/l; pH 6.5
2.24 U CO/ml

Thermal stability

For further processing only.

Cholesterol Oxidase

from *Nocardia erythropolis*, CE ≤0.005%, solution

Cat. No.	Pack Size
10 262 595 103	custom fill

Will be supplied as "Chol. Oxidase, Nocardia erythropolis". Unit of Measure is "kU".

For further processing only.

Oxidoreductase that catalyzes the interconversion of cholesterol to cholest-4-en-3-one.

Application

Use Cholesterol Oxidase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Esterase, Catalog Nos. 10 129 046 103, 10 262 609 103, 11 015 923 103, 11 520 857 103 or 11 641 735 103.

Benefits

- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.3.6

Properties

Nomenclature: Cholesterol:oxygen oxidoreductase
Molecular weight: ~59 kD
Isoelectric point: 4.85
Michaelis constants (Cholesterol):
Phosphate buffer, pH 7.0: 1 x 10^{-6} mol/l
Triton X-100/isopropanol, pH 7.0: 7 x 10^{-6} mol/l
Inhibitors: $ZnCl_2$, Brij 35, Tween 40, Tween 60, Hg^{2+}, GSH, sodium dodecyl sulfate,laurylbenzenesulfonate
Activators: Hydroxypolyethoxydodecane, Triton X-100, DOC
pH optimum: 7.0-8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Cholesterol (100%), b-cholestanol, pregnenolone, b-sitosterol and stigmasterol react as substrates (65-70%). Dehydroisoandrosterone and ergosterol show 5% relative activity. Androsterone, testosterone, β-estradiol, vitamin D3, cholic acid and cholesterol acetate do not react.

Specification

Appearance: Brownish-yellow, slightly turbid solution in NaCl solution, 3 mol/l
pH value: 5.7-6.3
Specific Activity: 25 U/mg protein
Protein: 1±0.1 mg/ml
NaCl (chloride meter): 3±0.2 mol/l
Contaminants (expressed as percentage of Cholesterol Oxidase activity):
Cholesterol esterase: ≤0.005
Glucose oxidase: ≤0.01
"NADH oxidase": ≤0.01
Uricase: ≤0.01
Stability: At +2 to +8°C within specification range for 12 months.

Cholesterol Oxidase

from *Streptomyces* species, lyophilizate

Oxidoreductase that catalyzes the interconversion of cholesterol to cholest-4-en-3-one.

Application

Use Cholesterol Oxidase in diagnostic tests for the determination of cholesterol in combination with Cholesterol Esterase, Catalog Nos. 10 129 046 103, 10 262 609 103, 11 015 923 103, 11 520 857 103 or 11 641 735 103.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.1.3.6

Specification

Appearance: Yellow lyophilizate
Solubility: Clear, yellow solution in water (c=20 mg/ml)
pH value (c=20 mg/ml): 7.0-8.0
Activity (+25°C, cholesterol): ≥3.0 to 4.6 U/mg lyophilizate
Specific activity: ≥40.0 U/mg protein
Protein (Biuret): No limit
Contaminants (expressed as percentage of Cholesterol Oxidase activity):
Glucose oxidase: ≤0.01
Catalase: ≤1.00
Uricase: ≤0.01
Stability: At -15 to -20°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 634 522 103	custom fill

Will be supplied as "Cholesterol Oxidase, Streptomyces species". Unit of Measure is "kU".

DRY ICE

For further processing only.

Citrate Lyase
from *Klebsiella pneumoniae*, lyophilizate

Cat. No.	Pack Size
10 354 066 103	custom fill

Will be supplied as "Citrate Lyase (CL), Aerobacter aerogenes". Unit of Measure is "kU".
For further processing only.

Enzyme that catalyzes the interconversion of oxalacetate and acetate to citrate.

Application
Use Citrate lyase in tests for citric acid in combination with Malate Dehydrogenase, Catalog Nos. 11 866 109 103 and 10 200 387 103, and Lactate Dehydrogenase, Catalog Nos. 11 291 416 103 , 12 235 650 103 or 10 003 557 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 4.1.3.6

Specification
Appearance: Slightly beige lyophilizate
pH value (hydrous solution): 6.5-7.5
Activity (+25 °C, citrate): ≥0.25 U/mg lyophilizate
Contaminants (expressed as percentage of Citrate Lyase activity):
Isocitrate dehydrogenase (NAD specific): ≤0.05
"NADH-oxidase": ≤0.05
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Citrate Synthase
from pig heart, suspension

Cat. No.	Pack Size
10 153 605 103	custom fill

Will be supplied as "Citrate Synthase (CS) from Pig Heart". Unit of Measure is "g".
For further processing only.

Enzyme that catalyzes the formation of citrate from acetyl-CoA and oxalacetate.

Application
Use Citrate Synthase in reagents for acetic acid testing in combination with Acetate-CoA Ligase (Acetyl-CoA Synthetase), Catalog Nos. 10 128 180 103 and 10 885 568 103, and L-Malate Dehydrogenase, Catalog Nos. 11 866 109 103 and 10 200 387 103 and 10 200 387 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 2.3.3.1

Specification
Appearance: Slightly grey-brown suspension in ammonium sulfate, 3.2 mol/l; potassium phosphate, 0.02 mol/l; pH approximately 7
Specific activity (+25°C, oxaloacetic acid): ≥110 U/mg protein
Protein (Biuret): ≥10 mg/ml
Contaminants (expressed as percentage of Citrate Synthase activity):
Oxaloacetate decarboxylase: ≤0.1
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months.

Colipase
from porcine pancreas, lyophilizate

Application
Use Colipase as a co-emulsifier in diagnostic tests for the determination lipase activity in combination with chromogenic Lipase Substrate, Catalog No. 11 034 618 103 or for the determination of triglycerides in combination with Lipase, Catalog no. 10 410 551 103.

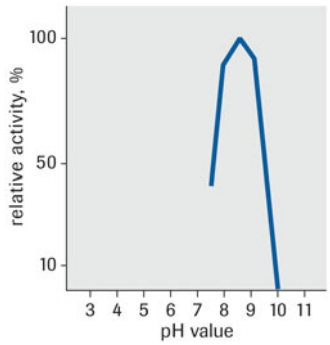
Benefits
- Activate lipase activity in your reagent mix.
- Rely on the proven diagnostic quality of this product.

Properties
Molecular weight: Approximately 10 kD
Isoelectric point: 5.0
pH optimum: 8.8 (see figure)
Temperature dependence: See figure
pH stability: 3.5-11.5 (see figure)
Thermal stability: +25 to +80°C (see figure)
Specificity: Pancreatic colipase consists of 3 forms, colipase101 (procolipase), colipase96 and colipase85 (numbers stand for amino acid residues). colipase96 and colipase85 are trypsin digestion products of colipase101.

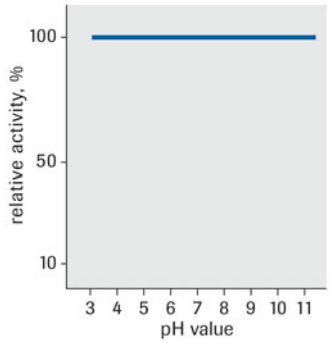
Specification
Appearance: White lyophilizate, TEA buffer, pH 6.0
Solubility: Clear, colorless solution in water (c=1 mg/ml)
pH value (c=1 mg/ml in water): 5.0-7.0
Protein (Lowry): 0.8±0.2 mg/mg lyophilizate
Colipase: ≥0.6 mg/mg lyophilizate
Activity (+25°C, tributyrin): ≥70 000 U/mg lyophilizate
Contaminants:
Lipase: ≤0.0005 U/mg lyophilizate
Proteases: ≤180 U/mg lyophilizate
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Cat. No.	Pack Size
10 204 307 103	custom fill

Will be supplied as "Colipase from Porcine Pancreas". Unit of Measure is "g active ingredient".

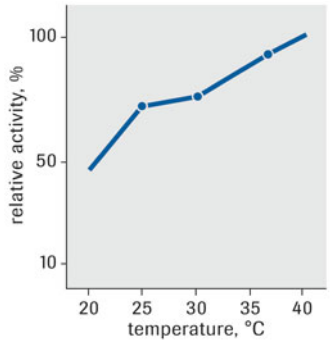


pH optimum

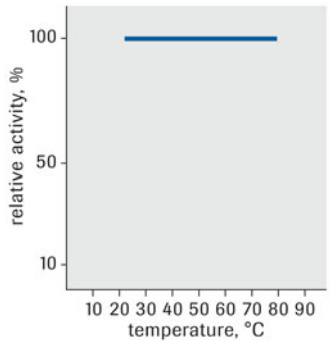


Incubation:
25°C, 60 min
pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
pH 6.0 – 8.0
phosphate buffer,
0.1 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.1 mol/l
0.7 mg colipase/ml

pH stability



Temperature dependence



Incubation:
10 min
water;
pH 4.5
0.7 mg colipase/ml

Thermal stability

For further processing only.

Creatinase
from microorganism, lyophilizate

Hydrolase for creatinine determination that catalyzes the conversion of creatine to sarcosine and urea.

Application
Use Creatinase in diagnostic reagent for the determination of creatinine in combination with Creatininase, Catalog No. 11 865 471 103 and Sarcosine Oxidase, Catalog No. 11 378 856 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.5.3.3

Specification
Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 5.5-6.5
Activity (+25°C, creatine, POD/PAP method): ≥4 U/mg lyophilizate
Specific activity: ≥9 U/mg protein
Protein (Biuret): 0.3-0.5 mg/mg lyophilizate
Contaminants (expressed as percentage of Creatinase activity):
Creatininase: ≤0.01
Catalase: ≤2
Creatinine deaminase: ≤0.01
Proteases (casein/resorufin, 2 hours stress duration): ≤0.001
Contaminating oxidases (FOX): ≤0.001
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
11 799 142 103	custom fill

Will be supplied as "Creatinase, Microbial Lyophil. Substance". Unit of Measure is "MU".

DRY ICE

For further processing only.

Creatininase
from *Pseudomonas* species, expressed in *E.coli*, lyophilizate

Hydrolase for creatinine determination that catalyzes the conversion of creatinine to creatine.

Application
Use Creatininase as a diagnostic reagent for the determination of creatinine in combination with Creatinase, Catalog No. 11 799 142 103 and Sarcosine Oxidase, Catalog No. 11 378 856 103.

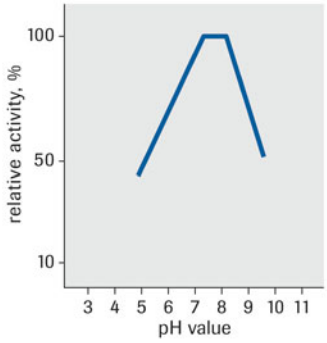
Benefits
Rely on the proven diagnostic quality of this product.

EC 3.5.2.10

Properties
Nomenclature: Creatinine amidohydrolase
Molecular weight (gel filtration): 175 kD
Structure (SDS PAGE): 8 equal subunits (23 kD + zinc)
Isoelectric point (IEF): 4.7
Michaelis constants (Glycylglycine buffer, pH 8.0, +25°C)**:**
Creatinine: 3 x 10^{-2} mol/l
Creatine: 6 x 10^{-2} mol/l
Inhibitors: Hg^{2+}, Fe^{3+}, Cu^{2+} (1 mmol/l), N-bromosuccinimide, o-phenanthroline, 4-chloromercuribenzoate. The enzyme is sensitive against photooxidation. A stable, inactive apoenzyme free of zinc can be obtained after EDTA

Cat. No.	Pack Size
11 865 471 103	custom fill

Will be supplied as "Creatininase, Recombinant Lyo". Unit of Measure is "MU".

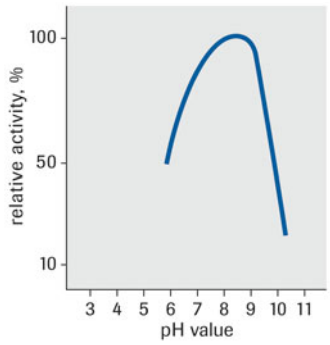


pH optimum

incubation which can be reactivated completely with Zn^{2+}, Mn^{2+}, Mg^{2+}, Co^{2+}, Fe^{2+} or Ni^{2+} (1 mmol/l).
Activators: Mn^{2+}, Mg^{2+}. The enzyme requires metal ions. Phenylmethylsulfonylfluoride and iodoacetamide do not react.
pH optimum: 7.8 (see figure)
Temperature dependence: See figure
pH stability: 7.5-9.0 (see figure
Thermal stability: Up to +65°C (see figure)
Specificity: Creatininase is specific for creatinine. It also reacts with glycocyamidine and glycocyamine. It does not react with hydantoin and its derivatives.

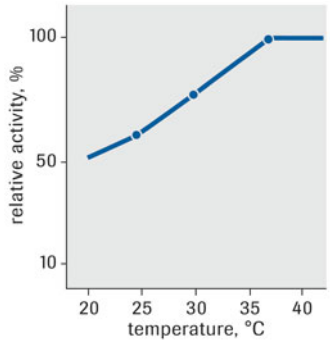
Specification
Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless to slightly yellowish solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 7.0-8.0
Activity (+25°C, creatinine): ≥55 U/mg lyophilizate
Specific activity: ≥250 U/mg protein
Protein (Biuret): 0.10-0.35 mg/mg lyophilizate
Contaminants (expressed as percentage of Creatininase activity):
ATPase: ≤0.01
Catalase: ≤2.0
Contaminating oxidases (FOX:) ≤0.001
Creatinine deaminase: ≤0.0015
Kinase test: ≤0.01
Proteases (casein/resorufin, 2 hours stress duration): ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Protect from light.

Literature
1) A.W. Wahlefeld, J. Siedel, in H.U. Bergmeyer, Methods of Enzymatic Analysis ***8***, 488 – 500 (1985)
2) J. Siedel, H. Möllering, J. Ziegenhorn, Clin. Chem. ***30***, 968 (1984)

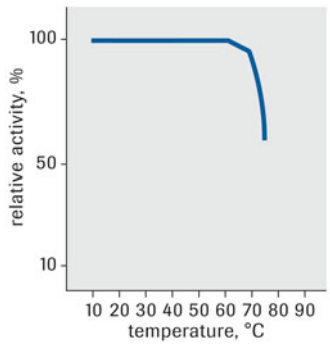


Incubation:
25°C, 120 min
pH 6.0 –10.0:
K-phosphate
buffer, 20 mmol/l
40 U creatininase/ml

pH stability



Temperature dependence



Incubation:
60 min
K-phosphate
buffer, 20 mmol/l;
pH 8.0
40 U creatininase/ml

Thermal stability

For further processing only.

Creatinine Deaminase
from *Corynebacterium lilium*, lyophilizate

Hydrolase for creatinine determination that catalyzes the conversion of creatinine to N-methylhydantoin and ammonia.

Application
Use Creatinine Deaminase in diagnostic tests for the determination of creatinine in combination with N-Carbamoylsarcosine Amidase, Catalog No. 11248 847 103, N-Methylhydantoinase (ATP-hydrolysing), Catalog No. 11 288 555 103 and Sarcosine Oxidase, Catalog No. 11 378 856 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.5.4.21

Cat. No.	Pack Size
11 330 764 103	custom fill

Will be supplied as "Creatinine Deiminase". Unit of Measure is "MU".
For further processing only.

Specification
Appearance: Beige lyophilizate
Solubility: Clear, yellowish solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 8.0-9.0
Activity (+25°C, creatinine, via N-methylhydantoin, UV): 45.0-90.0 U/mg lyophilizate
Activity (+25°C, creatinine, via NH_3, UV): 35.0-70.0 U/mg lyophilizate
Protein (BCA): 10-30 mg/100 mg lyophilizate
Contaminants (expressed as percentage of Creatinine Desaminase activity)
ATPase: ≤0.1
Creatinase: ≤0.013
Creatininase: ≤0.01
Catalase: ≤10.0
Urease: ≤0.007
Uricase: ≤0.01
NH_3: ≤0.01µg/U
Stability: At +2 to +8°C within specification range for 12 months. Store dry. Protect from light.

Formate Dehydrogenase
from yeast, lyophilizate

Cat. No.	Pack Size
10 204 226 103	custom fill

Will be supplied as "Formate Dehydrogenase from Yeast". Unit of Measure is "kU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of formate to carbon dioxide.

Application
Use Formate Dehydrogenase in diagnostic tests for the determination of oxalate in combination with Oxalate Oxidase, Catalog No. 10 570 524 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.2.1.2

Specification
Appearance: White lyophilizate
pH value (c=10 mg/ml in water): Approximately 7.5
Activity (+25°C, formiate): ≥0.40 U/mg lyophilizate
Specific activity: ≥3.0 U/mg protein
Contaminants (expressed as percentage of Formate Dehydrogenase activity):
Alcohol dehydrodenase: ≤0.05
Lactate dehydrogenase: ≤0.05
Malate dehydrogenase: ≤0.1
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Galactose 1-Dehydrogenase
from *E.coli* overproducer, lyophilizate

Cat. No.	Pack Size
11 290 983 103	custom fill

Will be supplied as "b-Galactose Dehydrogenase S". Unit of Measure is "kU".
For further processing only.

Dehydrogenase that catalyzes the oxidation of galactose to D-galactono-1,4-lactone.

Application
Use Galactose 1-Dehydrogenase in diagnostic tests for the determination of total galactose.

Benefits
- Rely on the proven diagnostic quality of this recombinant enzyme.

EC 1.1.1.48

Specification
Appearance: White lyophilizate
Specific activity (+25°C, galactose): ≥50 U/mg protein
Protein (Biuret): ≥0.3-0.7 mg/mg lyophilizate
Contaminants (expressed as percentage of Galactose 1-Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
β-Galactosidase: ≤0.01
Glutamate dehydrogenase (standard): ≤0.5
Lactate dehydrogenase: ≤0.1
Malate dehydrogenase: ≤1.0
"NADH-oxidase": ≤0.05
Stability: At +2 to +8°C within specification range for 12 months.

Galactose 1-Dehydrogenase
from *E.coli* overproducer, suspension

Cat. No.	Pack Size
10 633 313 103	custom fill

Will be supplied as "b-Galactose Dehydrogenase S, E. coli". Unit of Measure is "kU".
For further processing only.

Dehydrogenase that catalyzes the oxidation of galactose to D-galactono-1,4-lactone.

Application
Use Galactose 1-Dehydrogenase in diagnostic tests for the determination of total galactose.

Benefits
- Apply this ready-to-use recombinant enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.48

Specification
Appearance: White suspension in ammonium sulfate solution, 3.2 mol/l, pH approximately 6
Specific activity (+25°C, D-galactose): ≥100 U/mg protein
Protein (Biuret): ≥1 mg/ml
Contaminants (expressed as percentage of Galactose 1-Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
β-Galactosidase: ≤0.01
Lactate dehydrogenase: ≤0.1
Malate dehydrogenase: ≤1.0
"NADH-oxidase": ≤0.05
Stability: At +2 to +8°C within specification range for 12 months.

Galactose 1-Dehydrogenase
from *Pseudomonas fluorescens*, suspension

Cat. No.	Pack Size
10 150 959 103	custom fill

Will be supplied as "b-Gal-DH from Pseudomonas fluorescens". Unit of Measure is "kU".
For further processing only.

Dehydrogenase that catalyzes the oxidation of galactose to D-galactono-1,4-lactone.

Application
Use Galactose 1-Dehydrogenase in diagnostic tests for the determination of total galactose.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.48

Specification

Appearance: White suspension in ammonium sulfate solution, 3.2 mol/l; EDTA, 1 mmol/l; pH approximately 6
Specific activity (+25°C, D-galactose): ≥5 U/mg protein
Protein (Biuret): 5±0.5 mg/ml
Contaminants (expressed as percentage of Galactose 1-Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
β-Galactosidase: ≤0.01
Lactate dehydrogenase: ≤0.5
"NADH-oxidase": ≤0.1
Stability: At +2 to +8°C within specification range for 12 months.

Glucose Oxidase (GOD), Grade I
from *Aspergillus niger* overproducer, lyophilizate

Cat. No.	Pack Size
12 158 566 103	custom fill

Will be supplied as "GOD, RG I, rec., Lyo.". Unit of Measure is "MU".

Oxidoreductase that catalyzes the conversion of D-glucose to D-glucono-1,5-lactone which hydrolyzes spontanously to gluconate.

Application

Use Glucose Oxidase (GOD), Grade I for the determination of α-amylase and D-glucose or O_2.

Benefits

- Take advantage of the tested low conductivity.
- Rely on the proven diagnostic quality of this product.

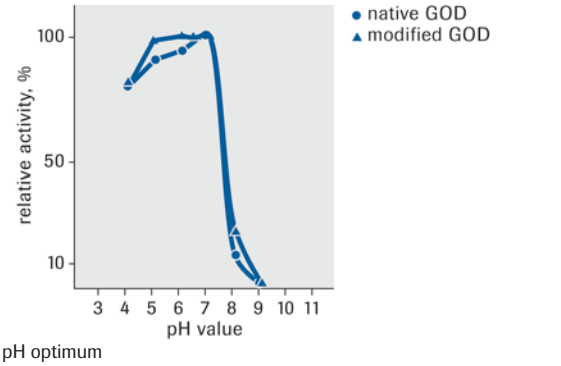
EC 1.1.3.4

Properties

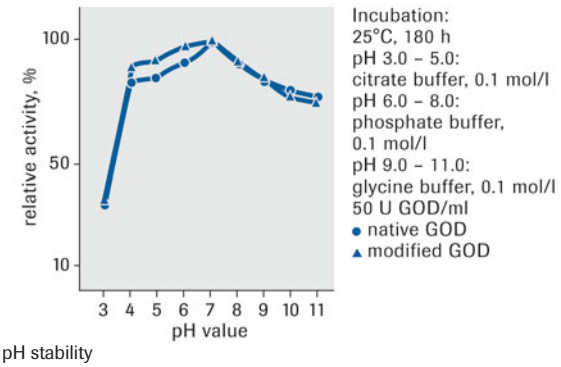
Nomenclature: β-D-glucose:oxygen 1-oxidoreductase
Molecular weight: 79 kD
Isoelectric point: 4.3
Michaelis constants (Glucose):
Acetate buffer, pH 5.0, +25°C: 3.6 x 10^{-2} mol/l
Potassium phosphate buffer, 0.2 mol/l, pH 7.5, +25°C: 4.8 x 10^{-2} mol/l
Inhibitors: Ag^+, Hg^{2+}, Cu^{2+}, 4-choloromercuribenzoate, D-arabinose (50%). FAD binding is inhibited by several nucleotides.
pH optimum: 7.0 (see figure)
Temperature dependence: See figure
pH stability: See figure
Thermal stability: See figure
Specificity: Glucose oxidase is specific for β-D-glucose. O_2 can be replaced by hydrogen acceptors such as 2,6-dichlorophenol indophenol.

Specification

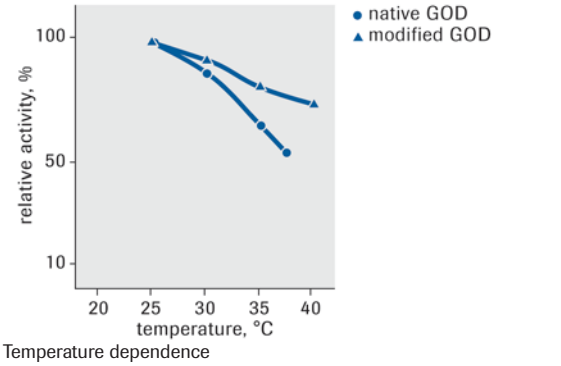
Appearance: Yellowish lyophilizate
Conductivity (1%, w/v): ≤250 µS/cm
Activity (+25°C, glucose): ≥300 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose Oxidase activity):
Amylase: ≤0.01
Catalase: ≤0.5
Saccharase: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months. Store dry.



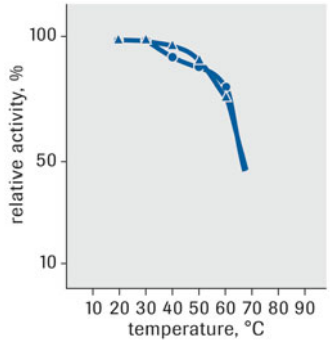
pH optimum



pH stability



Temperature dependence



Thermal stability

For further processing only.

Glucose Oxidase (GOD), Grade II

from *Aspergillus niger* overproducer, lyophilizate

Oxidoreductase that catalyzes the conversion of D-glucose to D-glucono-1,5-lactone which hydrolyzes spontanously to gluconate.

Application

Use Glucose Oxidase (GOD), Grade II for the determination of α-amylase and D-glucose or O_2.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.1.3.4

Properties

Nomenclature: β-D-glucose:oxygen 1-oxidoreductase
Molecular weight: 79 kD
Isoelectric point: 4.3
Michaelis constants (Glucose):
Acetate buffer, pH 5.0, +25°C: 3.6 x 10^{-2} mol/l
Potassium phosphate buffer, 0.2 mol/l, pH 7.5, +25°C: 4.8 x 10^{-2} mol/l
Inhibitors: Ag^+, Hg^{2+}, Cu^{2+}, 4-choloromercuribenzoate, D-arabinose (50%). FAD binding is inhibited by several nucleotides.
pH optimum: 7.0 (see figure)
Temperature dependence: See figure
pH stability: See figure
Thermal stability: See figure
Specificity: Glucose oxidase is specific for β-D-glucose. O_2 can be replaced by hydrogen acceptors such as 2,6-dichlorophenol indophenol.

Specification

Appearance: Yellow brown lyophilizate
Solubility: Clear, yellow solution in phosphate buffer, 0.1 mol/l, pH 7.0 (c=5 mg/ml)
pH value (c=10 mg/ml in water): 6.8-7.8
Protein (Pierce): No limit
Activity (+25°C, glucose): ≥250 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose Oxidase activity):
Amylase: ≤0.1
Catalase: ≤5 U/mg lyophilizate
Saccharase: ≤0.1
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Cat. No.	Pack Size
11 939 998 103	custom fill

Will be supplied as "GOD, rec., Lyo.". Unit of Measure is "MU".
For further processing only.

Glucose Oxidase (GOD), chemically modified

from *Aspergillus niger* overproducer, lyophilizate

Oxidoreductase that catalyzes the conversion of D-glucose to D-glucono-1,5-lactone which hydrolyzes spontanously to gluconate.

Application

Use Glucose Oxidase (GOD), chemically modified for the determination of α-amylase and D-glucose or O_2.

Benefits

- Take advantage of the enhanced liquid stability.
- Rely on the proven diagnostic quality of this product.

EC 1.1.3.4

Properties

Nomenclature: β-D-glucose:oxygen 1-oxidoreductase
Molecular weight: 79 kD
Isoelectric point: 4.3
Michaelis constants (Glucose):
Acetate buffer, pH 5.0, +25°C: 3.6 x 10^{-2} mol/l
Potassium phosphate buffer, 0.2 mol/l, pH 7.5, +25°C: 4.8 x 10^{-2} mol/l
Inhibitors: Ag^{+}, Hg^{2+}, Cu^{2+}, 4-choloromercuribenzoate, D-arabinose (50%). FAD binding is inhibited by several nucleotides.
pH optimum: 7.0 (see figure)
Temperature dependence: See figure
pH stability: See figure
Thermal stability: See figure
Specificity: Glucose oxidase is specific for β-D-glucose. O_2 can be replaced by hydrogen acceptors such as 2,6-dichlorophenol indophenol.
Remark: The modified enzyme is especially suited for liquid stable applications with extended shelf life requirements.

Specification

Appearance: Yellowish white lyophilizate
pH value (c=40 mg/ml in water): 6.5-7.5
Activity (+25°C, glucose): ≥20 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose Oxidase activity):
Catalase: ≤20 U/mg lyophilizate
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
11 485 938 103	custom fill

Will be supplied as "GOD, Asp.niger, Bound to Dextran". Unit of Measure is "MU".
For further processing only.

Glucose-6-phosphate Dehydrogenase (G6P-DH)

from *Leuconostoc mesenteroides*, expressed in *E. coli*, lyophilizate

Cat. No.	Pack Size
11 293 206 103	custom fill

Will be supplied as "G6P-DH, rec., Lyo". Unit of Measure is "MU".

Dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits

Rely on the proven diagnostic quality of this product.

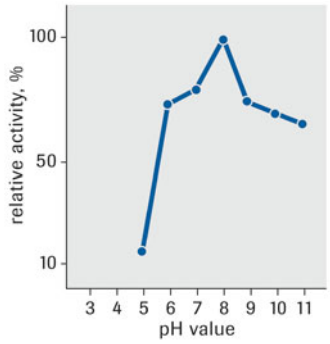
EC 1.1.1.49

Properties

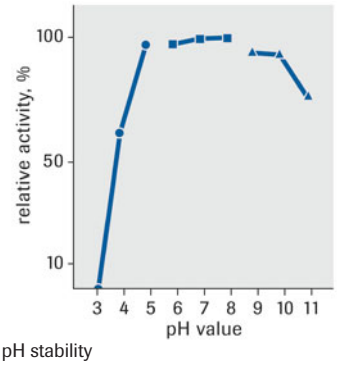
Nomenclature: D-glucose-6-phosphate:NAD(P)$^+$ 1-oxidoreductase
Molecular weight: 110 kD (1) (2 identical subunits 55,000 D)
Isoelectric point: pH 4.6
Michaelis constants (Tris: 0.1 mol/l; pH 7.8, +25°C)**:**
NAD: 1.4 x 10^{-4} mmol/l
NADP: 3.7 x 10^{-5} mmol/l
Glucose-6-P: 3.7 x 10^{-4} mmol/l (NAD as coenzyme)
Glucose-6-P: 2.0 x 10^{-4} mmol/l (NADP as coenzyme)
Activators/inhibitors:
Phosphate, 5 mmol/l: 100% (NAD), 80% (NADP)
Phosphate, 50 mmol/l: 100% (NAD), 80% (NADP)
Without Mg^{2+}: 90% (NAD), 80% (NADP)
Mg^{2+}, 3 mmol/l: 100% (NAD), 100% (NADP)
Mg^{2+}, 30 mmol/l: 100% (NAD), 100% (NADP)
HCO^{3-}, 3 mmol/l: 100% (NAD), 100% (NADP)
Inhibitors: NADPH is a competitive inhibitor in the NAD-dependent reaction. Unlike the yeast enzyme, myristic acid, dehydroepiandrosterone and palmitoyl CoA do not inhibit.
pH optimum: 7.8 (see figure)
Temperature dependence: See figure
pH stability: 5.0-10.0 (see figure)
Thermal stability: Up to +40°C for native G6P-DH, up to +50°C for modified G6P-DH (see figure)
Buffer stability: Temperature stability can be significantly improved by the increase of ionic strength (see figure).
Stability of the lyophilizate: 100% residual activity after 3 weeks at +35°C
Specificity: G6P-DH is highly specific for glucose-6-phosphate and does not react with fructose-6-P, fructose-1,6-P_2 or gluose-1P . 2-Deoxyglucose-6-P is slowly oxidized with NAD (5%) and with NADP (4%).

Specification

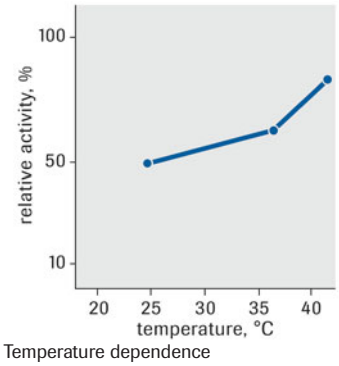
Appearance: White or slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml, water): 6.5-7.5
Activity (+25°C, glucose-6-P, NAD): ≥600 U/mg lyophilizate
Specific activity (+25°C): ≥800 U/mg protein
Activity (+30°C): ≥750 U/mg lyophilizate
Activity (+37°C): ≥1,000 U/mg lyophilizate
Activity (+25°C, glucose-6-P, NADP): No limit
Protein (Biuret): 0.7-0.9 mg/mg lyophilizate
Contaminants (expressed as percentage of Glucose-6-phosphate dehydrogenase activity):
ATPase: ≤0.02
Creatine kinase: ≤0.001



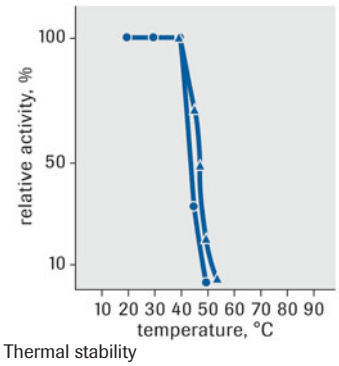
pH optimum



Incubation:
25°C, 180 min
● pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
■ pH 6.0 – 8.0:
phosphate buffer,
0.1 mol/l
▲ pH 9.0 –11.0:
glycine buffer, 0.1 mol/l
500 U G6P-DH/ml
pH stability

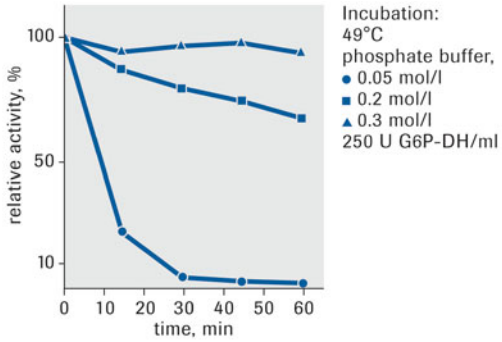


Temperature dependence



Incubation:
20 min
phosphate buffer,
0.02 mol/l; pH 7.5
50 U G6P-DH/ml
● native G6P-DH
▲ modified G6P-DH
Thermal stability

Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.001
Hexokinase and Glucose dehydrogenase: ≤0.05
Myokinase: ≤0.001
"NADH oxidase": ≤0.02
"NADPH oxidase": ≤0.0005
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase : ≤0.01
Phosphoglucomutase: ≤0.001
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



Buffer stability

For further processing only.

Glucose-6-phosphate Dehydrogenase (G6P-DH), chemically modified

from *Leuconostoc mesenteroides*, expressed in *E. coli*, lyophilizate

Cat. No.	Pack Size
11 389 343 103	custom fill

Will be supplied as "G6P-DH, rec., Lyo., mod.". Unit of Measure is "MU".
For further processing only.

Recombinant dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits

- Take advantage of the improved stability in liquid reagents.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Properties

Nomenclature: D-glucose-6-phosphate:NAD(P)$^+$ 1-oxidoreductase
Molecular weight: 110 kD (2 identical subunits 55,000 D)
Isoelectric point: pH 4.6
Michaelis constants (Tris: 0.1 mol/l; pH 7.8, +25°C)**:**
NAD: 1.4 x 10^{-4} mmol/l
NADP: 3.7 x 10^{-5} mmol/l
Glucose-6-P: 3.7 x 10^{-4} mmol/l (NAD as coenzyme)
Glucose-6-P: 2.0 x 10^{-4} mmol/l (NAD as coenzyme)
Activators/inhibitors:
Phosphate, 5 mmol/l: 100% (NAD), 80% (NADP)
Phosphate, 50 mmol/l: 100% (NAD), 80% (NADP)
Without Mg^{2+}: 90% (NAD), 80% (NADP)
Mg^{2+}, 3 mmol/l: 100% (NAD), 100% (NADP)
Mg^{2+}, 30 mmol/l: 100% (NAD), 100% (NADP)
HCO^{3-}, 3 mmol/l: 100% (NAD), 100% (NADP)
Inhibitors: NADPH is a competitive inhibitor in the NAD-dependent reaction. Unlike the yeast enzyme, myristic acid, dehydroepiandrosterone and palmitoyl CoA do not inhibit.
pH optimum: 7.8 (see figure)
Temperature dependence: See figure
pH stability: 5.0-10.0 (see figure)
Thermal stability: Up to +40°C for native G6P-DH, up to +50°C for modified G6P-DH (see figure)
Buffer stability: Temperature stability can be significantly improved by the

increase of ionic strength (see figure).
Stability of the lyophilizate: 100% residual activity after 3 weeks at +35°C
Specificity: G6P-DH is highly specific for glucose-6-phosphate and does not react with fructose-6-P, fructose-1,6-P2 or gluose-1P. 2-Deoxyglucose-6-P is slowly oxidized with NAD (5%) and with NADP (4%).
Remark: The modified enzyme is especially suited for liquid stable applications with extended shelf life requirements.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=40 mg/ml)
pH value (c=40 mg/ml in water): 6.5-7.5
Activity (+25°C, glucose-6-P, NAD): ≥30 U/mg lyophilizate
Activity (+30°C): ≥39 U/mg lyophilizate
Activity (+37°C): ≥54 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
ATPase: ≤0.02
Creatine kinase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.001
Hexokinase and Glucose dehydrogenase: ≤0.05
Myokinase: ≤0.05
"NADH oxidase": ≤0.02
"NADPH oxidase": ≤0.0005
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase : ≤0.01
Phosphoglucomutase: ≤0.001
Glucose: ≤0.3 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

Glucose-6-phosphate Dehydrogenase (G6P-DH)
from *Leuconostoc mesenteroides*, expressed in *E. coli*, solution

Recombinant dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application
Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Properties
Nomenclature: D-glucose-6-phosphate:NAD(P)$^+$ 1-oxidoreductase
Molecular weight: 110 kD (1) (2 identical subunits 55,000 D)
Isoelectric point: pH 4.6
Michaelis constants (Tris: 0.1 mol/l; pH 7.8, +25°C)**:**
NAD: 1.4 x 10^{-4} mmol/l
NADP: 3.7 x 10^{-5} mmol/l
Glucose-6-P: 3.7 x 10^{-4} mmol/l (NAD as coenzyme)
Glucose-6-P: 2.0 x 10^{-4} mmol/l (NAD as coenzyme)
Activators/inhibitors:

Cat. No.	Pack Size
11 650 742 103	custom fill

Will be supplied as "G6P-DH, Recombinant (E. coli)". Unit of Measure is "MU".
For further processing only.

Phosphate, 5 mmol/l: 100% (NAD), 80% (NADP)
Phosphate, 50 mmol/l: 100% (NAD), 80% (NADP)
Without Mg^{2+}: 90% (NAD), 80% (NADP)
Mg^{2+}, 3 mmol/l: 100% (NAD), 100% (NADP)
Mg^{2+}, 30 mmol/l: 100% (NAD), 100% (NADP)
HCO^{3-}, 3 mmol/l: 100% (NAD), 100% (NADP)
Inhibitors: NADPH is a competitive inhibitor in the NAD-dependent reaction. Unlike the yeast enzyme, myristic acid, dehydroepiandrosterone and palmitoyl CoA do not inhibit.
pH optimum: 7.8 (see figure)
Temperature dependence: See figure
pH stability: 5.0-10.0 (see figure)
Thermal stability: Up to +40°C for native G6P-DH, up to +50°C for modified G6P-DH (see figure)
Buffer stability: Temperature stability can be significantly improved by the increase of ionic strength (see figure).
Stability of the lyophilizate: 100% residual activity after 3 weeks at +35°C
Specificity: G6P-DH is highly specific for glucose-6-phosphate and does not react with fructose-6-P, fructose-1,6-P2 or gluose-1P. 2-Deoxyglucose-6-P is slowly oxidized with NAD (5%) and with NADP (4%).

Specification

Appearance: Clear, yellowish solution in glycerol
pH value: 6.0-7.0
Activity (+25°C, glucose-6-P): ≥2,500 U/ml
Activity (+30°C): ≥3,000 U/ml
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
ATPase: ≤0.0200
Creatine kinase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.001
Hexokinase and Glucose dehydrogenase: ≤0.05
Myokinase: ≤0.01
"NADH oxidase": ≤0.02
"NADPH oxidase": ≤0.0005
Phosphoglucomutase: ≤0.001
6-Phosphogluconate dehydrogenase (NAD): ≤0.001
6-Phosphogluconate dehydrogenase (NADP): ≤0.001
Phophoglucose isomerase : ≤0.01
Glycerol (enzymatically): 45-55% (v/v)
Stability: At +2 to +8°C within specification range for 12 months.

Glucose-6-phosphate Dehydrogenase (G6P-DH)

from *Leuconostoc mesenteroides*, lyophilizate

Dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Cat. No.	Pack Size
10 186 783 103	custom fill

Will be supplied as "G6P-DH from Leuconostoc mesenteroides".
Unit of Measure is "kU".
For further processing only.

Specification

Appearance: White or slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10mg/ml)
pH value (c=10mg/ml in water): 6.5-7.5
Activity (+25°C, glucose-6-P): ≥400 U/mg lyophilizate
Activity (+30°C): ≥520 U/mg lyophilizate
Activity (+37°C): ≥720 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
ATPase: ≤0.02
Creatine kinase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.001
Hexokinase and Glucose dehydrogenase: ≤0.05
Myokinase: ≤0.05
"NADH oxidase": ≤0.02
"NADPH oxidase": ≤0.0005
Phosphoglucomutase: ≤0.001
6-Phosphogluconate dehydrogenase (NAD): ≤0.001
6-Phosphogluconate dehydrogenase (NADP): ≤0.001
Phophoglucose isomerase: ≤0.01
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Glucose-6-phosphate Dehydrogenase (G6P-DH)

from *Leuconostoc mesenteroides*, expressed in *E. coli*, reduced phosphate, lyophilizate

Cat. No.	Pack Size
11 650 734 103	custom fill

Unit of Measure is "MU".
For further processing only.

Recombinant dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase, reduced phosphate for the determination of inorganic phosphate in an colorimetric enzymatic reaction.

Benefits

- Take advantage of the strongly reduced concentration of phosphate.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Specification

Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10mg/ml in water): 6.5-7.5
Activity (+25°C, glucose-6-P): ≥600 U/mg lyophilizate
Activity (+30°C): ≥750 U/mg lyophilizate
Activity (+37°C): ≥1,000 U/mg lyophilizate
Specific activity (+25°C, glucose-6-P): ≥800 U/mg
Protein (Biuret): 0.8-1.0 mg/mg lyophilizate
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
ATPase: ≤0.00005
Creatine kinase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.001
α-Glucosidase: ≤0.00010
Hexokinase and glucose dehydrogenase: ≤0.05
Myokinase: ≤0.001
"NADH oxidase": ≤0.02

"NADPH oxidase": ≤0.0005
Phosphoglucomutase: ≤0.001
6-Phosphogluconate dehydrogenase (NAD): ≤0.001
6-Phosphogluconate dehydrogenase (NADP): ≤0.0001
Phophoglucose isomerase: ≤0.01
Phosphate (as P_i): ≤10 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

Glucose-6-phosphate Dehydrogenase (G6P-DH)

from *Leuconostoc mesenteroides*, suspension

Cat. No.	Pack Size
10 128 171 103	custom fill

Will be supplied as "G6P-DH from Leuconostoc mesenteroides".
Unit of Measure is "MU".
For further processing only.

Dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits

- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Specification

Appearance: Yellowish suspension in ammonium sulfate
pH value: 5.5-6.5
Specific activity (+25°C, glucose-6-P): ≥550 U/mg
Specific activity (+30°C): ≥650 U/mg
Specific activity (+37°C): ≥800 U/mg
Protein (Biuret): ≥5 mg/ml
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
ATPase: ≤0.02
Creatine kinase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Glutathione reductase (NADH): ≤0.001
Hexokinase and Glucose dehydrogenase: ≤0.05
Myokinase: ≤0.05
"NADH oxidase": ≤0.02
"NADPH oxidase": ≤0.0005
Phosphoglucomutase: ≤0.001
6-Phosphogluconate dehydrogenase (NAD): ≤0.001
6-Phosphogluconate dehydrogenase (NADP): ≤0.001
Phophoglucose isomerase: ≤0.01
Stability: At +2 to +8°C within specification range for 18 months.

Glucose-6-phosphate Dehydrogenase (G6P-DH)

from yeast, lyophilizate

Cat. No.	Pack Size
10 190 454 103	custom fill

Will be supplied as "Glucose-6-phosphate Dehydrogenase, Yeast".
Unit of Measure is "MU".
For further processing only.

Dehydrogenase, that catalyzes the oxidation of Glucose-6-phosphate.

Application

Use Glucose-6-phosphate Dehydrogenase for the determination of blood glucose or creatine kinase.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.1.1.49

Specification
Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml): 6.0–7.0
Activity (+25°C, glucose-6-P): ≥15.0 U/mg lyophilizate
Contaminants (expressed as percentage of Glucose-6-phosphate Dehydrogenase activity):
Creatine kinase: ≤0.001
Glutathione reductase: ≤0.05
Hexokinase: ≤0.02
Phosphoglucomutase: ≤0.01
6-Phosphogluconate dehydrogenase: ≤0.01
Phophoglucose isomerase: 0.002
Bioburden: ≤10,000 CFU/g
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Glucose-6-phosphate Isomerase
from yeast, suspension

Cat. No.	Pack Size
10 154 334 103	custom fill

Will be supplied as "Phosphoglucose Isomerase (PGI) from Yeast".
Unit of Measure is "MU".
For further processing only.

Isomerase, that catalyzes the conversion of glucose-6-phosphate into fructose 6-phosphate.

Application
Use Glucose-6-phosphate Isomerase for the isomerization of ketoses to aldoses and can be used for the determination of fructose-6-phosphate.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 5.3.1.9

Specification
Appearance: White suspension in ammonium sulfate, 3.2 mol/l
Specific activity (+25°C, fructose-6-P): ≥350 U/mg protein
Protein (Biuret): 10±1 mg/ml
Contaminants (expressed as percentage of Glucose-6-phosphate Isomerase activity):
Fructose-6-phosphate kinase: ≤0.01
β-Fructosidase: ≤0.2
Glutathione reductase: ≤0.01
Phosphoglucomutase: ≤0.01
6-Phosphogluconate dehydrogenase: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months.

α-Glucosidase

from yeast overproducer, multifunctional, lyophilizate

Recombinant glucosidase, that hydrolyzes 1,4-linked α-D-glucose residues with release of α-D-glucose.

Application

Use α-Glucosidase in diagnostic tests for the determination of α-amylase and pancreatic α-amylase activity according to the recommendations of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC). It catalyzes the 100% liberation of p-nitrophenol residues from the amylase substrate EPS (Catalog No. 10 880 078 103) once it has been cleaved by α-amylase.

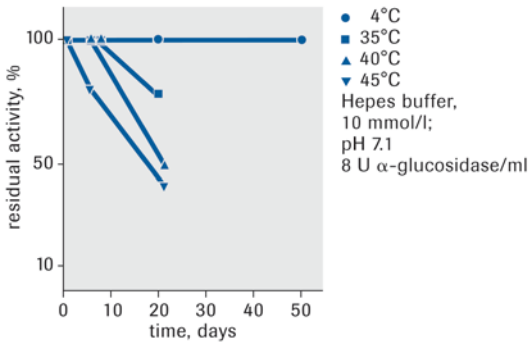
Benefits

Use this recombinant enzyme in your amylase reagent mix and rely on the 100% chromophore liberation and the proven diagnostic quality of this product.

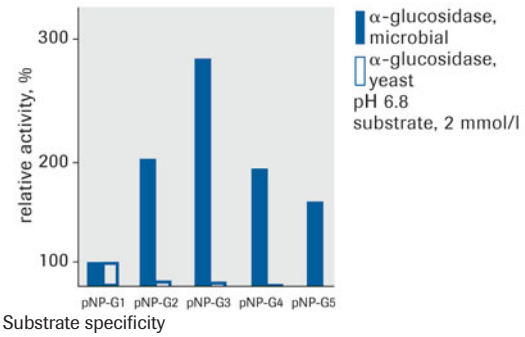
EC 3.2.1.20

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml): 6.8-7.4
Activity (+37°C, 4-NP-α-D-glucoside): ≥60 U/mg lyophilizate
Specific activity: ≥130 U/mg protein
Protein (Biuret): 25-45 mg/100 mg lyophilizate
Contaminants (expressed as percentage of α-Glucosidase activity):
α-Amylase: ≤0.00001
Stability: At -15 to -20°C within specification range for 12 months. Store dry.



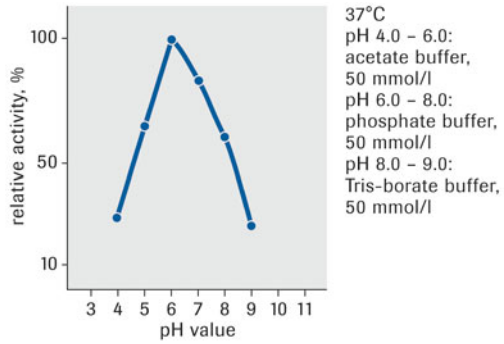
Stability in solution



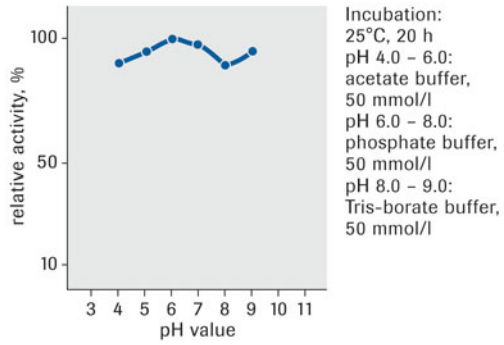
Substrate specificity

Cat. No.	Pack Size
11 626 329 103	custom fill

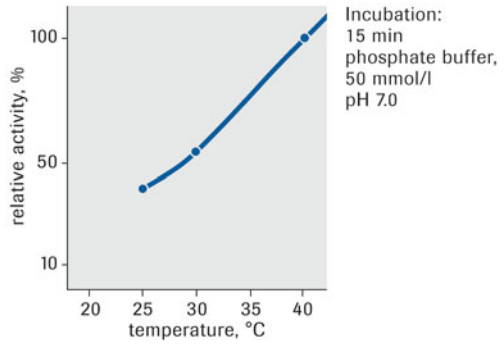
Will be supplied as "a-Glucosidase Multifunctional". Unit of Measure is "MU".



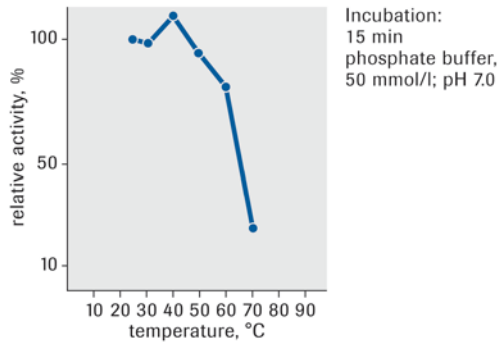
pH optimum



pH stability



Temperature dependence



Thermal stability

For further processing only.

β-Glucuronidase
from *E.coli*, solution

Cat. No.	Pack Size
03 708 446 103	custom fill

Will be supplied as "beta-Glucuronidase E.coli K12 Glycerol". Unit of Measure is "MU".
For further processing only.

Hydrolase that cleaves β-linked terminal glucuronic acid.

Application
Use β-Glucuronidase in reagents for drug monitoring and doping analysis where it catalyzes the hydrolysis of steroid conjugates to detect various steroids in urine.

Benefits
- Take advantage of the high specific activity of the *E.coli* enzyme and its great affinity for the various β-glucuronides.
- Save time. Develop your procedure without the need of cleaning up the reaction and buffering the urine.

EC 3.2.1.31

Specification
Appearance: Clear, colorless solution
Specific activity (+25°C, 4-NP-glucuronide): ≥80 U/mg protein
Specific activity (+37°C, 4-NP-glucuronide): ≥140 U/mg protein
Protein (Biuret): ≥0.5 mg/ml solution
Stability: At +2 to +8°C within specification range for 18 months.

Glutamate Dehydrogenase (NAD(P))
from *E.coli* overproducer, lyophilizate

Cat. No.	Pack Size
11 745 727 103	custom fill

Will be supplied as "GIDH, Lyo., rec.". Unit of Measure is "MU".
For further processing only.

Recombinant glutamate dehydrogenase.

Application
Use recombinant Glutamate Dehydrogenase in diagnostic tests for the determination of ammonia, urea, L-glutamate, glutamate pyruvate transaminase and leucine aminopeptidase.

Benefits
- Rely on the proven diagnostic quality of this product.

EC 1.4.1.3

Properties
Nomenclature: L-glutamate:$NAD(P)^+$ oxidoreductase (deaminating)
Molecular weight: ~2 200 kD for the associated enzyme with 8 subunits; 280 kD for one subunit.
Michaelis constants (Tris buffer, pH 8.0, +23°C):
L-glutamate: 1.8×10^{-3} mol/l
NADP: 4.7×10^{-5} mol/l
α-ketoglutarate: 7.0×10^{-4} mol/l
NH_4^+: 3.2×10^{-3} mol/l
NADPH: 2.6×10^{-5} mol/l
Km values for NAD or NADH are difficult to obtain due to their inhibitory action.
Inhibitors: 4-chloromercuribenzoate, Na_2S, diethyldithiocarbamate, 1,10-phenanthroline,
8-hydroxyquinoline, NaN_3, thyroxine, heparin, sulfonylcarbamides, Cu^{2+}, Hg^{2+}, Ag^{2+}, Fe^{3+}, Zn^{2+}, K^+, PO_4^{2-}, NO_3^-
Activators: Thioglycolic acid, b-mercaptoethylamine, EDTA, α, α'-dipyridyl
pH optimum: 8.0 (see figure)
Temperature dependence: See figure

pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +60°C (see figure)
Specificity: The oxidation of L-glutamate is stimulated by ADP and inhibited by GTP. In contrast, the oxidation of alanine, leucine, isoleucine, methionine, valine, norleucine, norvaline and 2-aminobutyrates is stimulated by GTP and inhibited by ADP.

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=20 mg/ml)
pH value (c=20 mg/ml in water): 6.5-7.5
Activity (+25°C, α-ketoglutarat): ≥80 U/mg lyophilizate
Contaminants (expressed as percentage of Glutamate Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.005
Lactate dehydrogenase: ≤0.005
Malate dehydrogenase: ≤0.005
"NADH-Oxidase": ≤0.005
NH_4: ≤0.05 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Glutamate Dehydrogenase (NAD(P))
from beef liver, lyophilizate

Cat. No.	Pack Size
10 190 462 103	custom fill

Will be supplied as "Glutamate Dehydrogenase from Beef Liver". Unit of Measure is "MU".

Dehydrogenase that catalyzes the conversion of glutamate to α-ketoglutarate.

Application

Use Glutamate Dehydrogenase in diagnostic tests for the determination of ammonia, urea, L-glutamate, glutamate pyruvate transaminase and leucine aminopeptidase.

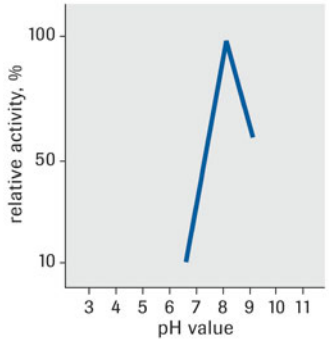
Benefits

Rely on the proven diagnostic quality of this product.

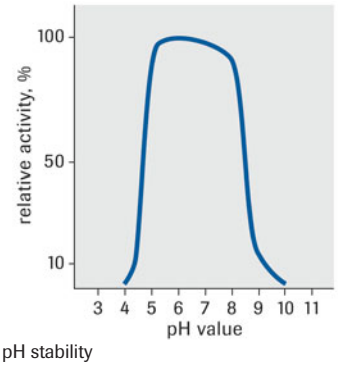
EC 1.4.1.3

Properties

Nomenclature: L-glutamate:$NAD(P)^+$ oxidoreductase (deaminating)
Molecular weight: ~2 200 kD for the associated enzyme with 8 subunits; 280 kD for one subunit.
Michaelis constants (Tris buffer, pH 8.0, +23°C):
L-glutamate: 1.8 x 10^{-3} mol/l
NADP: 4.7 x 10^{-5} mol/l
α-ketoglutarate: 7.0 x 10^{-4} mol/l
NH_4^+: 3.2 x 10^{-3} mol/l
NADPH: 2.6 x 10^{-5} mol/l
Km values for NAD or NADH are difficult to obtain due to their inhibitory action.
Inhibitors: 4-chloromercuribenzoate, Na_2S, diethyldithiocarbamate, 1,10-phenanthroline, 8-hydroxyquinoline, NaN_3, thyroxine, heparin, sulfonylcarbamides, Cu^{2+}, Hg^{2+}, Ag^{2+}, Fe^{3+}, Zn^{2+}, K^+, PO_4^{2-}, NO_3^-
Activators: Thioglycolic acid, b-mercaptoethylamine, EDTA, α, α'-dipyridyl
pH optimum: 8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +60°C (see figure)
Specificity: The oxidation of L-glutamate is stimulated by ADP and inhibited by GTP. In contrast, the oxidation of alanine, leucine, isoleucine, methionine,



pH optimum

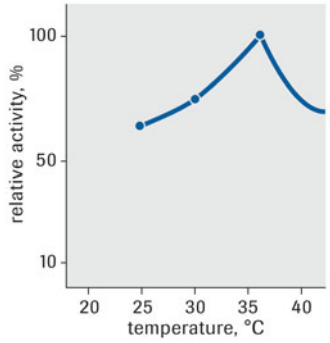


pH stability

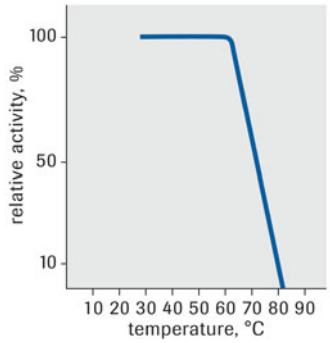
Incubation:
25°C, 180 min
pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
pH 6.0 – 8.0:
phosphate buffer, 0.1 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.1 mol/l
120 U GIDH/ml

valine, norleucine, norvaline and 2-aminobutyrates is stimulated by GTP and inhibited by ADP.
Remarks:
- Glutamate dehydrogenase suspension or solution can be dialyzed against phosphate buffer, 10 mmol/l. Glutamate dehydrogenase molecules have the tendency to associate in some test formulations, modified Glutamate dehydrogenase minimizes this effect.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in water (c=20 mg/ml)
pH value (c=20 mg/ml in water): 6.5-7.5
Activity (+25°C, α-oxoglutarat): ≥10 U/mg lyophilizate
Contaminants (expressed as percentage of Glutamate Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.005
Lactate dehydrogenase: ≤0.005
Malate dehydrogenase: ≤0.005
NH_4: ≤0.1 µg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 18 months. Store dry.



Temperature dependence



Incubation:
10 min
$(NH_4)_2 SO_4$, 2.0 mol/l,
pH 7.0
2400 U GIDH/ml

Thermal stability

For further processing only.

Glutamate Dehydrogenase (NAD(P))
from beef liver, chemically modified, lyophilizate

Dehydrogenase that catalyzes the conversion of glutamate to α-ketoglutarate.

Application
Use modified Glutamate Dehydrogenase in diagnostic tests for the determination of ammonia, urea, L-glutamate, glutamate pyruvate transaminase and leucine aminopeptidase.

Benefits
- Take advantage of the enhanced liquid stability.
- Rely on the proven diagnostic quality of this product.

EC 1.4.1.3

Properties
Nomenclature: L-glutamate:NAD(P)$^+$ oxidoreductase (deaminating)
Molecular weight: ~2 200 kD for the associated enzyme with 8 subunits; 280 kD for one subunit.
Michaelis constants (Tris buffer, pH 8.0, +23°C):
L-glutamate: 1.8 x 10^{-3} mol/l
NADP: 4.7 x 10^{-5} mol/l
α-ketoglutarate: 7.0 x 10^{-4} mol/l
NH_4^+: 3.2 x 10^{-3} mol/l
NADPH: 2.6 x 10^{-5} mol/l
Km values for NAD or NADH are difficult to obtain due to their inhibitory action.
Inhibitors: 4-chloromercuribenzoate, Na_2S, diethyldithiocarbamate, 1,10-phenanthroline,

Cat. No.	Pack Size
11 434 993 103	custom fill

Will be supplied as "GIDH, Modified from Beef Liver". Unit of Measure is "MU".
For further processing only.

8-hydroxyquinoline, NaN_3, thyroxine, heparin, sulfonylcarbamides, Cu^{2+}, Hg^{2+}, Ag^{2+}, Fe^{3+}, Zn^{2+}, K^+, PO_4^{2-}, NO_3^-
Activators: Thioglycolic acid, b-mercaptoethylamine, EDTA, α, α'-dipyridyl
pH optimum: 8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +60°C (see figure)
Specificity: The oxidation of L-glutamate is stimulated by ADP and inhibited by GTP. In contrast, the oxidation of alanine, leucine, isoleucine, methionine, valine, norleucine, norvaline and 2-aminobutyrates is stimulated by GTP and inhibited by ADP.
Remarks:
- Glutamate dehydrogenase suspension or solution can be dialyzed against phosphate buffer, 10 mmol/l. Glutamate dehydrogenase molecules have the tendency to associate in some test formulations, modified Glutamate dehydrogenase minimizes this effect.
-The modified enzyme is especially suited for liquid stable applications with extended shelf life requirements.

Specification
Appearance: White lyophilizate, stabilized with RPLA 4 and ADP
Solubility: Clear, slightly opalescent solution in water (c=40 mg/ml)
Activity (+25°C, α-oxoglutarat): ≥7 U/mg lyophilizate
Contaminants (expressed as percentage of Glutamate Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.005
Lactate dehydrogenase: ≤0.005
Malate dehydrogenase: ≤0.005
NH_4: ≤0.16 µmol/KU Glutamate Dehydrogenase
K (flame photometric): ≤0.1 µmol/KU Glutamate Dehydrogenase
Na (flame photometric): ≤2.0 µmol/KU Glutamate Dehydrogenase
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Glutamate Dehydrogenase (NAD(P))
from beef liver, solution

Dehydrogenase that catalyzes the conversion of glutamate to α-ketoglutarate.

Application
Use Glutamate Dehydrogenase in diagnostic tests for the determination of ammonia, urea, L-glutamate, glutamate pyruvate transaminase and leucine aminopeptidase.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.4.1.3

Properties
Nomenclature: L-glutamate:NAD(P)$^+$ oxidoreductase (deaminating)
Molecular weight: ~2 200 kD for the associated enzyme with 8 subunits; 280 kD for one subunit.
Michaelis constants (Tris buffer, pH 8.0, +23°C):
L-glutamate: 1.8 x 10^{-3} mol/l
NADP: 4.7 x 10^{-5} mol/l
α-ketoglutarate: 7.0 x 10^{-4} mol/l
NH_4^+: 3.2 x 10^{-3} mol/l
NADPH: 2.6 x 10^{-5} mol/l

Cat. No.	Pack Size
10 120 847 103	custom fill

Will be supplied as "Glutamate Dehydrogenase, Beef Liver". Unit of Measure is "I".
For further processing only.

Km values for NAD or NADH are difficult to obtain due to their inhibitory action.
Inhibitors: 4-chloromercuribenzoate, Na_2S, diethyldithiocarbamate, 1,10-phenanthroline,
8-hydroxyquinoline, NaN_3, thyroxine, heparin, sulfonylcarbamides, Cu^{2+}, Hg^{2+}, Ag^{2+}, Fe^{3+}, Zn^{2+}, K^+, PO_4^{2-}, NO_3^-
Activators: Thioglycolic acid, b-mercaptoethylamine, EDTA, α, α'-dipyridyl
pH optimum: 8.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-6.5 (see figure)
Thermal stability: Up to +60°C (see figure)
Specificity: The oxidation of L-glutamate is stimulated by ADP and inhibited by GTP. In contrast, the oxidation of alanine, leucine, isoleucine, methionine, valine, norleucine, norvaline and 2-aminobutyrates is stimulated by GTP and inhibited by ADP.
Remarks: GIDH suspension or solution can be dialyzed against phosphate buffer, 10 mmol/l. GIDH molecules have the tendency to associate in some test formulations, modified GIDH minimizes this effect.

Specification
Appearance: Clear, colourless solution in glycerol
pH value: 7.0-7.8
Specific Activity: ≥120 U/mg
Protein (Biuret): 30±3 mg/ml
Contaminants (expressed as percentage of Glutamate Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
Lactate dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.01
NH_4: ≤0.16 µg/mg protein
Glycerol: 560-680 mg/ml (45-55% (v/v))
EDTA (complexometric): 12.2-13.4 mmol/l
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 18 months.

γ-Glutamyltransferase
from hog kidney, lyophilizate

Cat. No.	Pack Size
10 445 363 103	custom fill

Will be supplied as "g-Glutamyltransferase from Hog Kidney". Unit of Measure is "kU".
For further processing only.

Application
Use γ-Glutamyltransferase for designing your calibrator or control reagent.

Benefits
Rely on the proven diagnostic quality of this product.

EC 2.3.2.2

Specification
Appearance: White/off white to buff lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Activity (+37°C, with γ-GT kit): >23 U/mg lyophilizate
Contaminants (expressed as percentage of γ-Glutamyltransferase activity):
Leucine aminopeptidase: <0.10
Phosphatase, alkaline: <2
"NADH oxidase": ≤0.01
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Glycerol Kinase (GK)

from *Bacillus stearothermophilus*, lyophilizate

Enzyme that catalyzes the phosphorylation of glycerol to glycerol-3-phosphate.

Application

Use Glycerol Kinase for diagnostic tests for the determination of triglycerides together with Glycerol-3-phosphate Oxidase, Catalog No.11 582 003 103 and 11 654 730 103, and Lipoprotein Lipase, Catalog No. 11 145 991 103.

Benefits

- Rely on the proven diagnostic quality of this product.

EC 2.7.1.30

Properties

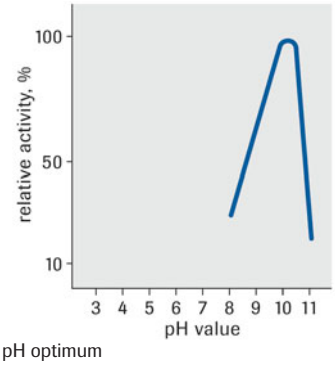
Nomenclature: ATP:glycerol 3-phosphotransferase
Molecular weight: 230 000 D (Sephadex G 200), 4 x 58 000 D (SDS-gel electrophoresis)
Michaelis constants (Glycine buffer, pH 9.8; +30°C):
Glycerol: 4.4 x 10^{-5} mol/l
Inhibitors: Unknown; Inhibitors of glycerokinase from *Candida mycoderma* do not inhibit the glycerokinase from *Bacillus stearothermophilus*.
pH optimum: 10.0-10.5 (see figure)
Temperature dependence: See figure
pH stability: 5.0-11.0 (see figure)
Thermal stability: Up to +60° C (see figure)

Specification

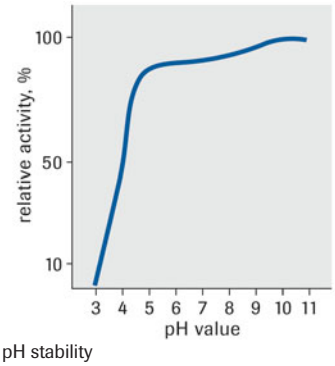
Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 5.0-7.0
Activity (+25°C, glycerol): 18-25 U/mg lyophilizate
Specific activity: ≥80 U/mg protein
Protein (Biuret): 0.18-0.26 mg/mg lyophilizate
Contaminants (expressed as percentage of Glycerol Kinase activity):
ATPase: ≤0.005
Hexokinase: ≤0.01
"NADH oxidase": ≤0.005
Glycerol: ≤4 µg/100 U (40 Mg/kU)
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
11 499 530 103	custom fill

Will be supplied as "GK, B.stearot., Lyo., w. Lactose". Unit of Measure is "MU".

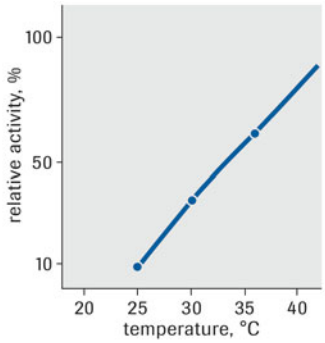


pH optimum

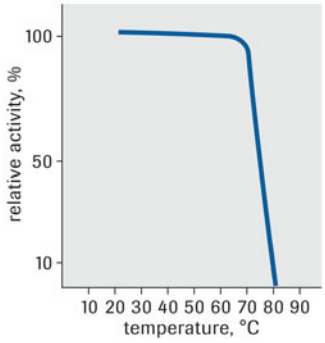


Incubation:
25°C, 180 min
pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
pH 6.0 – 8.0:
phosphate buffer,
0.1 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.1
mol/l
85 U GK/ml

pH stability



Temperature dependence



Incubation:
10 min
Tris buffer, 0.1 mol/l;
pH 9.0
510 U GK/ml

Thermal stability

For further processing only.

Glycerol Kinase (GK)
from *Bacillus stearothermophilus*, solution

Cat. No.	Pack Size
10 691 666 103	custom fill

Will be supplied as "Glycerokinase from Bac.stearothermophil.". Unit of Measure is "kU".
For further processing only.

Enzyme that catalyzes the phosphorylation of glycerol to glycerol-3-phosphate.

Application
Use Glycerol Kinase for diagnostic tests for the determination of triglycerides together with Glycerol-3-phosphate Oxidase, Catalog No. 11 582 003 103 and 11 654 730 103, and Lipoprotein Lipase, Catalog No. 11 145 991 103.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 2.7.1.30

Properties
Nomenclature: ATP:glycerol 3-phosphotransferase
Molecular weight: 230 000 D (Sephadex G 200), 4 x 58 000 D (SDS-gel electrophoresis)
Michaelis constants (Glycine buffer, pH 9.8; +30°C):
Glycerol: 4.4 x 10^{-5} mol/l
Inhibitors: Unknown; Inhibitors of glycerokinase from *Candida mycoderma* do not inhibit the glycerokinase from *Bacillus stearothermophilus*.
pH optimum: 10.0-10.5 (see figure)
Temperature dependence: See figure
pH stability: 5.0-11.0 (see figure)
Thermal stability: Up to +60° C (see figure)

Specification
Appearance: Clear, colorless to slightly yellowish solution in Tris buffer; 1 mol/l
Activity (+25°C, glycerol): ≥500 U/ml
Specific activity: ≥85 U/mg protein
Protein (Biuret): No limit
Contaminants (expressed as percentage of Glycerol Kinase activity):
Hexokinase: ≤0.01
"NADH oxidase": ≤0.005
Stability: At +2 to +8°C within specification range for 12 months.

Glycerol Kinase (GK), concentrated
from *Bacillus stearothermophilus*, solution

Cat. No.	Pack Size
10 539 937 103	custom fill

Will be supplied as "Glycerokinase, Bac. stearothermophilus". Unit of Measure is "MU".
For further processing only.

Enzyme that catalyzes the phosphorylation of glycerol to glycerol-3-phosphate.

Application
Use Glycerol Kinase for diagnostic tests for the determination of triglycerides together with Glycerol-3-phosphate Oxidase, Catalog No. 11 582 003 103 and 11 654 730 103, and Lipoprotein Lipase, Catalog No. 11 145 991 103.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 2.7.1.30

Properties
Nomenclature: ATP:glycerol 3-phosphotransferase
Molecular weight: 230 000 D (Sephadex G 200), 4 x 58 000 D (SDS-gel electrophoresis)

Michaelis constants (Glycine buffer, pH 9.8; +30°C):
Glycerol: 4.4 x 10^{-5} mol/l
Inhibitors: Unknown; Inhibitors of glycerokinase from *Candida mycoderma* do not inhibit the glycerokinase from *Bacillus stearothermophilus*.
pH optimum: 10.0-10.5 (see figure)
Temperature dependence: See figure
pH stability: 5.0-11.0 (see figure)
Thermal stability: Up to +60° C (see figure)

Specification

Appearance: Clear, colorless to slightly yellowish solution in Tris buffer; pH approx. 7.3; stabilized. Particles as result of recristallized salts.
pH value (c=10 mg/ml, in water): 7.1-7.5
Activity (+25°C, glycerol): ≥2200 U/ml
Specific activity: ≥85 U/mg protein
Protein (Biuret): No limit
Contaminants (expressed as percentage of Glycerol Kinase activity):
Hexokinase: ≤0.01
"NADH oxidase": ≤0.005
Stability: At +2 to +8°C within specification range for 12 months.

Glycerol-3-phosphate Dehydrogenase
from rabbit muscle, suspension

Cat. No.	Pack Size
10 151 351 103	custom fill

Will be supplied as "GDH from Rabbit Muscle". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of dihydroxyacetone phosphate to glycerol 3-phosphate.

Application

Use Glycerol-3-phosphate Dehydrogenase in diagnostic reagents for the determination of aldolase in combination with Triose-phosphate Isomerase, Catalog No. 10 153 338 103, and Fructose-1,6-diphosphate, Catalog No. 10 041 793 103.

Benefits

- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.8

Specification

Appearance: White suspension in ammonium sulfate, 3.2 mol/l, pH approximately 6
pH value: 5.5-6.5
Activity: ≥2000 U/ml solution
Specific activity (+25°C, glyceraldehyde-3-phosphate): ≥170 U/mg protein
Protein (Biuret): 10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Glycerol-3-phosphate Dehydrogenase activity):
Aldolase: ≤0.001
Glyceraldehyde-3-phosphate dehydrogenase: ≤0.001
Lactate dehydrogenase: ≤0.01
Triose-phosphate isomerase: ≤0.01
Stability: At +2 to +8°C within specification range for 18 months.

Glycerol-3-phosphate Oxidase
from *E.coli* overproducer, lyophilizate

Cat. No.	Pack Size
11 654 730 103	custom fill

Will be supplied as "L-a-Glycerol-phosphate Oxidase, rec., Lyo.".
Unit of Measure is "MU".
Additional formulation: Lyophilizate, Catalog No. 11 582 003 103

Recombinant oxidoreductase that catalyzes the interconversion of glycerol 3-phosphate to dihydroxyacetone phosphate.

Application
Use Glycerol-3-phosphate Oxidase in diagnostic tests for the determination of triglycerides together with Glycerol Kinase, Catalog No. 10 539 937 103 or 11 499 530 103 and Lipoprotein Lipase, Catalog No. 11 145 991 103.

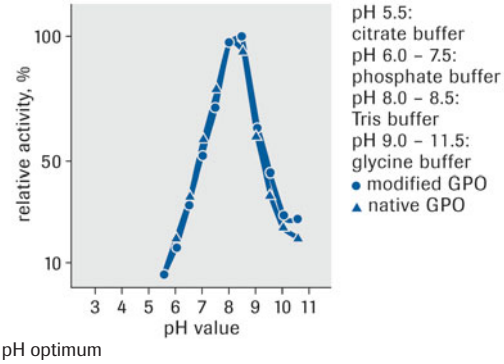
Benefits
Rely on the proven diagnostic quality of this product.

EC 1.1.3.21

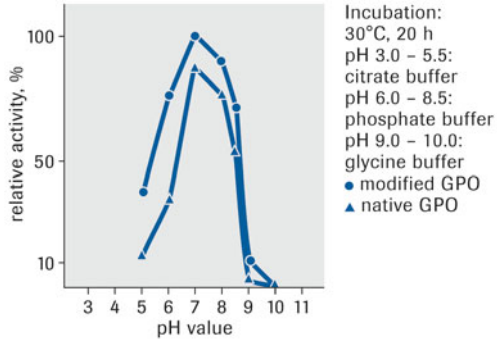
Properties
Nomenclature: Glycerol-3-phosphate : oxygen oxidoreductase
Molecular weight: 75 kD (SDS-PAGE); 74 kD (gel filtration, Sephadex G 150)
Isoelectric point: ~4.2 (230 000 D (Sephadex G 200), 4 x 58 000 D (SDS-gel electrophoresis))
Michaelis constants (L-glycerol phosphate):
K-phosphate buffer, 0.1 mol/l; pH 7.5: 1.36 x 10^{-2} mol/l (o-dianisidine assay)
Tris buffer, 0.1 mol/l; pH 7.6: 2.90 x 10^{-3} mol/l (o-dianisidine assay)
Tris buffer, 0.1 mol/l; pH 8.1: 1.40 x 10^{-3} mol/l (PAP assay)
Structure: Monomeric protein with FAD as cofactor
Inhibitors: Ag, Hg-salts and SDS
pH optimum: 8.0-8.5 (see figure)
Temperature dependence: See figure
pH stability: 6.5-8.5 (see figure)
Thermal stability: See figure
Specificity: Glycerol phosphate oxidase reacts highly specific with L-α-glycerol phosphate.

Specification
Appearance: Greenish yellow lyophilizate
Solubility: Clear yellow solution in Tris/HCl, 150 mmol/l, pH 7.6 (c=10 mg/ml)
Activity (+25°C, L-α-glycerol-3-phosphate): ≥50 U/mg lyophilizate
Activity (+37°C): ≥90 U/mg lyophilizate
Contaminants (expressed as percentage of Glycerol-3-phosphate Oxidase activity):
Cholesterol oxidase: ≤0.001
Lactate oxidase: ≤0.002
Uricase: ≤0.001
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

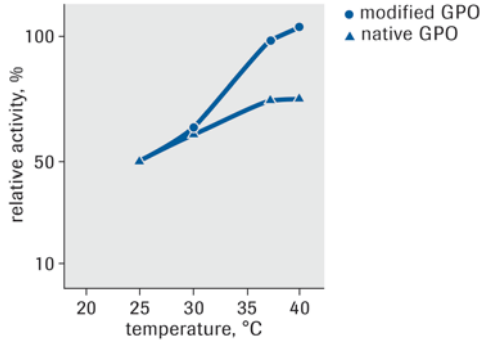
Literature
1) J. Siedel, M. Town, W. Hölzel, Long-term stable, liquid, ready-to-use monoreagent for the enzymatic assay of serum or plasma triglycerides (GPO-PAP method), Poster presented at the XV Int. Congress of Clin. Chem., Melbourne/ Australia, Nov. 1993



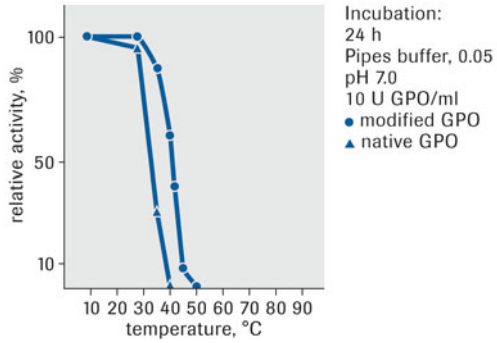
pH optimum



pH stability



Temperature dependence



Thermal stability

For further processing only.

Glycerol-3-phosphate Oxidase, chemically modified

from *E.coli* overproducer, lyophilizate

Recombinant oxidoreductase that catalyzes the interconversion of glycerol 3-phosphate to dihydroxyacetone phosphate.

Application

Use Glycerol-3-phosphate Oxidase in diagnostic tests for the determination of triglycerides together with Glycerol Kinase, Catalog No. 10 539 937 103 or 11 499 530 103 and Lipoprotein Lipase, Catalog No. 11 145 991 103.

Benefits

- Take advantage of the enhanced liquid stability of this enzyme.
- Rely on the proven diagnostic quality of this product.

EC 1.1.3.21

Properties

Nomenclature: Glycerol-3-phosphate : oxygen oxidoreductase
Molecular weight: 75 kD (SDS-PAGE); 74 kD (gel filtration, Sephadex G 150)
Isoelectric point: ~4.2 (230 000 D (Sephadex G 200), 4 x 58 000 D (SDS-gel electrophoresis))
Michaelis constants (L-glycerol phosphate):
K-phosphate buffer, 0.1 mol/l; pH 7.5: 1.36 x 10^{-2} mol/l (o-dianisidine assay)
Tris buffer, 0.1 mol/l; pH 7.6: 2.90 x 10^{-3} mol/l (o-dianisidine assay)
Tris buffer, 0.1 mol/l; pH 8.1: 1.40 x 10^{-3} mol/l (PAP assay)
Structure: Monomeric protein with FAD as cofactor
Inhibitors: Ag, Hg-salts and SDS
pH optimum: 8.0-8.5 (see figure)
Temperature dependence: See figure
pH stability: 6.5-8.5 (see figure)
Thermal stability: See figure
Specificity: Glycerol phosphate oxidase reacts highly specific with L-α-glycerol phosphate.

Specification

Appearance: Green yellow amorphous lyophilizate
Solubility: Clear yellow solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 6.8-7.8
Activity (+25°C, L-α-glycerol phosphate): ≥5 U/mg lyophilizate
Specific activity (+25°C): ≥40 U/mg protein
Activity (+37°C, L-α-glycerol phosphate): ≥10 U/mg lyophilizate
Protein (BCA): ≥0.1 mg/mg lyophilizate
Contaminants (expressed as percentage of Glycerol-3-phosphate Oxidase activity):
Cholesterol oxidase: ≤0.001
Lactate oxidase: ≤0.002
Uricase: ≤0.001
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Literature

1) J. Siedel, M. Town, W. Hölzel, Long-term stable, liquid, ready-to-use monore-agent for the enzymatic assay of serum or plasma triglycerides (GPO-PAP method), Poster presented at the XV Int. Congress of Clin. Chem., Melbourne/ Australia, Nov. 1993

Cat. No.	Pack Size
11 582 003 103	custom fill

Will be supplied as "L-Glycerol-3-phosphate Oxidase rec. mod.".
Unit of Measure is "MU".
Additional formulation: Lyophilizate, Catalog No. 11 654 730
For further processing only.

Hexokinase (HK)
from yeast overproducer, lyophilizate

Recombinant enzyme that converts hexose to hexose-6-phosphate.

Application
Use Hexokinase in diagnostic tests for blood glucose using the hexokinase method.

Benefits
Rely on the proven diagnostic quality of this product.

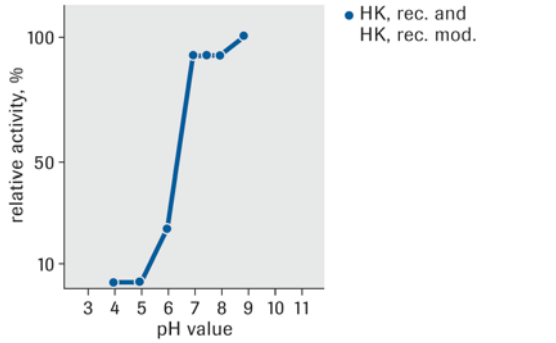
EC 2.7.1.1

Properties
Nomenclature: ATP:D-hexose 6-phosphotransferase
Molecular weight: 57 kD (SDS-PAGE)
Isoelectric point: 4.5-5.0
Michaelis constants (D-glucose)**:**
Phosphate buffer, 0.1 mol/l, pH 7.0; +25°C: 3.05 x 10^{-4} mol/l
Phosphate buffer, 0.1 mol/l, pH 7.4; +30°C: 1.90 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 2.30 x 10^{-4} mol/l
Michaelis constants (ATP):
Tris buffer, 0.1 mol/l, pH 7.6; +28°C: 1.60 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 1.90 x 10^{-4} mol/l
Inhibitors: EDTA, SH-blocking compounds, sorbose-1-phosphate, polyphosphates, 6-deoxy-6-fluoroglucose, 2-C-hydroxymethylglucose, lyxose.
Activators: Mg^{2+}, catecholamines
pH optimum: 7.0-10.0 (see figure)
Temperature dependence: See figure
pH stability: 5.0-9.0 (see figure)
Thermal stability: 100% for 20 minutes at +37°C, 50% for 20 minutes at +45°C, 75% for 5 hours at +37°C (see figures)
Specificity: Hexokinase phosphorylates D-glucose, D-fructose, D-mannose, D-glucosamin, 2-deoxyglucose. L-Arabinose, D-xylose, L-rhamnose, D-galactose, D-lactose, sucrose, maltose, trehalose, raffinose, N-acetyl glucosamine do not react. ATP can be partially replaced by other nucleotides.

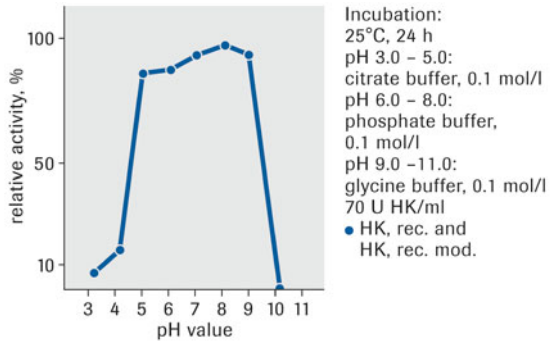
Specification
Appearance: Yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 6.5-7.5
Activity (+25°C, glucose): ≥70 U/mg lyophilizate
Activity (+30°C): ≥98 U/mg lyophilizate
Activity (+37°C): ≥115 U/mg
Protein (Biuret): 0.15±0.05 mg/mg lyophilizate
Contaminants (expressed as percentage of Hexokinase activity):
Alcohol dehydrogenase: ≤0.001
ATPase: ≤0.05
Creatine kinase: ≤0.001
G6P-DH: ≤0.005
Glutamate dehydrogenase: ≤0.05
Glutathione reductase: ≤0.005
Myokinase: ≤0.001
"NADH oxidase": ≤0.001
"NADPH oxidase": ≤0.001
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase: ≤0.002
Phosphoglucomutase: ≤0.02
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

Cat. No.	Pack Size
11 119 796 103	custom fill

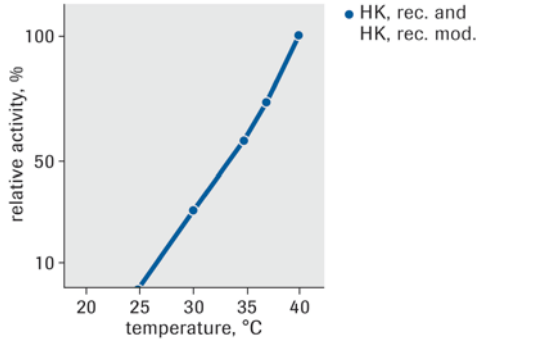
Will be supplied as "Hexokinase (HK) from Yeast Overproducer". Unit of Measure is "MU".



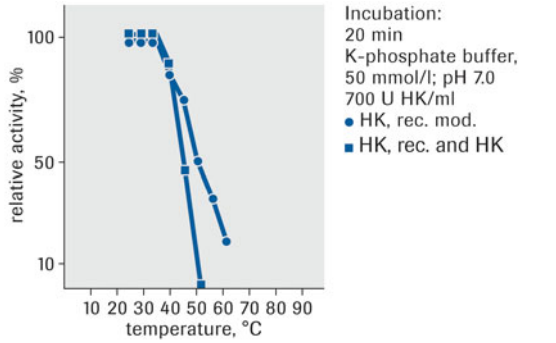
pH optimum



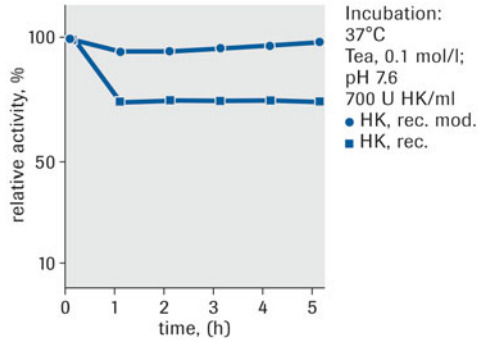
pH stability



Temperature dependence



Thermal stability



Thermal stability

For further processing only.

Hexokinase (HK), chemically modified
from yeast overproducer, lyophilizate

Cat. No.	Pack Size
11 370 600 103	custom fill

Will be supplied as "Hexokinase (HK) from Rec.Yeast, Modif.". Unit of Measure is "MU".
For further processing only.

Recombinant enzyme that converts hexose to hexose-6-phosphate.

Application
Use Hexokinase in diagnostic tests for blood glucose using the hexokinase method.

Benefits
- Take advantage of the improved stability in liquid reagents.
- Rely on the proven diagnostic quality of this product.

EC 2.7.1.1

Properties
Nomenclature: ATP:D-hexose 6-phosphotransferase
Molecular weight: 57 kD (SDS-PAGE)
Isoelectric point: 4.5-5.0
Michaelis constants (D-glucose)**:**
Phosphate buffer, 0.1 mol/l, pH 7.0; +25°C: 3.05 x 10^{-4} mol/l
Phosphate buffer, 0.1 mol/l, pH 7.4; +30°C: 1.90 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 2.30 x 10^{-4} mol/l
Michaelis constants (ATP):
Tris buffer, 0.1 mol/l, pH 7.6; +28°C: 1.60 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 1.90 x 10^{-4} mol/l
Inhibitors: EDTA, SH-blocking compounds, sorbose-1-phosphate, polyphosphates, 6-deoxy-6-fluoroglucose, 2-C-hydroxymethylglucose, lyxose.
Activators: Mg^{2+}, catecholamines
pH optimum: 7.0-10.0 (see figure)
Temperature dependence: See figure
pH stability: 5.0-9.0 (see figure)
Thermal stability: see figure p. 108.
Specificity: Hexokinase phosphorylates D-glucose, D-fructose, D-mannose, D-glucosamin, 2-deoxyglucose. L-Arabinose, D-xylose, L-rhamnose, D-galactose, D-lactose, sucrose, maltose, trehalose, raffinose, N-acetyl glucosamine do not react. ATP can be partially replaced by other nucleotides.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=40 mg/ml)
pH value (c=40 mg/ml in water): 6.5-7.5
Activity (+25°C, glucose): ≥40 U/mg lyophilizate
Contaminants (expressed as percentage of hexokinase activity):

Alcohol dehydrogenase: ≤0.001
ATPase: ≤0.05
Creatine kinase: ≤0.001
G6P-DH: ≤0.005
Glutamate dehydrogenase: ≤0.05
Glutathione reductase: ≤0.005
Myokinase: ≤0.001
"NADH oxidase": ≤0.001
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase: ≤0.002
Phosphoglucomutase: ≤0.02
Glucose: ≤0.3 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 18 months. Store dry.
Remark: This enzyme is especially suited for liquid stable applications with extended shelf life requirements.

Hexokinase (HK)
from yeast overproducer, solution

Recombinant enzyme that converts hexose to hexose-6-phosphate.

Application
Use Hexokinase in diagnostic tests for blood glucose using the hexokinase method.

Benefits
- Apply this ready-to-use recombinant enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 2.7.1.1

Properties
Nomenclature: ATP:D-hexose 6-phosphotransferase
Molecular weight: 57 kD (SDS-PAGE)
Isoelectric point: 4.5-5.0
Michaelis constants (D-glucose)**:**
Phosphate buffer, 0.1 mol/l, pH 7.0; +25°C: 3.05 x 10^{-4} mol/l
Phosphate buffer, 0.1 mol/l, pH 7.4; +30°C: 1.90 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 2.30 x 10^{-4} mol/l
Michaelis constants (ATP):
Tris buffer, 0.1 mol/l, pH 7.6; +28°C: 1.60 x 10^{-4} mol/l
Tea buffer, 0.1 mol/l, pH 7.6; +25°C: 1.90 x 10^{-4} mol/l
Inhibitors: EDTA, SH-blocking compounds, sorbose-1-phosphate, polyphosphates, 6-deoxy-6-fluoroglucose, 2-C-hydroxymethylglucose, lyxose.
Activators: Mg^{2+}, catecholamines
pH optimum: 7.0-10.0 (see figure)
Temperature dependence: See figure
pH stability: 5.0-9.0 (see figure)
Thermal stability: 100% for 20 minutes at +37°C, 50% for 20 minutes at +45°C, 75% for 5 hours at +37°C (see figures)
Specificity: Hexokinase phosphorylates D-glucose, D-fructose, D-mannose, D-glucosamin, 2-deoxyglucose. L-Arabinose, D-xylose, L-rhamnose, D-galactose, D-lactose, sucrose, maltose, trehalose, raffinose, N-acetyl glucosamine do not react. ATP can be partially replaced by other nucleotides.

Specification
Appearance: Clear, yellowish solution, in 50% glycerol (v/v)
pH value: 6.0-7.0

Cat. No.	Pack Size
11 149 130 103	custom fill

Will be supplied as "Hexokinase (HK) from Recombinant Yeast".
Unit of Measure is "MU".
For further processing only.

Activity (+25°C, glucose): ≥1,200 U/ml
Activity (+30°C): ≥1,680 U/ml
Protein (Biuret): ≥75 mg/ml
Contaminants (expressed as percentage of Hexokinase activity):
Alcohol dehydrogenase: ≤0.001
ATPase: ≤0.05
Creatine kinase: ≤0.001
G6P-DH: ≤0.005
Glutamate dehydrogenase: ≤0.01
Glutathione reductase: ≤0.005
Myokinase: ≤0.001
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase: ≤0.002
Phosphoglucomutase: ≤0.02
Glucose: ≤0.125 µg/mg lyophilizate
Glycerol (enzymatically): 45-55%
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

Hexokinase (HK)
from yeast, lyophilizate

Cat. No.	Pack Size
10 152 676 103	custom fill

Will be supplied as "Hexokinase (HK) from Yeast". Unit of Measure is "MU".
For further processing only.

Enzyme that converts hexose to hexose-6-phosphate.

Application
Use Hexokinase in diagnostic tests for blood glucose using the hexokinase method.

Benefits
Rely on the proven diagnostic quality of this product.

EC 2.7.1.1

Specification
Appearance: Yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml): 6.5-7.5
Activity (+25°C; Glucose): ≥40 U/mg lyophilizate
Protein (Biuret): 0.4±0.1 mg/mg lyophilizate
Contaminants (expressed as percentage of Hexokinase activity):
ATPase: ≤0.05
Alcohol dehydrogenase: ≤0.001
Creatine kinase: ≤0.001
G6P-DH: ≤0.005
Glutamate dehydrogenase: ≤0.05
Glutathione reductase: ≤0.005
Myokinase: ≤0.001
Phosphoglucomutase: ≤0.02
6-Phosphogluconate dehydrogenase: ≤0.001
Phophoglucose isomerase: ≤0.002
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

D-Lactate Dehydrogenase (D-LDH)
from microorganism, lyophilizate

Cat. No.	Pack Size
12 235 650 103	custom fill

Will be supplied as "LDH". Unit of Measure is "MU".
DRY ICE
For further processing only.

Recombinant dehydrogenase that catalyzes the interconversion of D(-)-lactate to pyruvate.

Application
Use D-Lactate Dehydrogenase in a variety of diagnostic tests, *e.g.,* in the determination of alanine aminotransferases, lactate or pyruvate. Used for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aspartate aminotransferases, glutamate dehydrogenase).

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.1.1.28

Specification
Appearance: White to slightly yellow powder or lyophilizate
Solubility: Soluble in water
Activity (+25°C, lyophilizate): ≥340 U/mg
Stability: At -15 to -25°C within specification range for 18 months. Store dry in tightly sealed containers.

D-Lactate Dehydrogenase (D-LDH), Grade I
from *Lactobacillus delbrückii*, lyophilizate

Cat. No.	Pack Size
11 291 416 103	custom fill

Will be supplied as "D(-)-LDH, Special Quality". Unit of Measure is "MU".

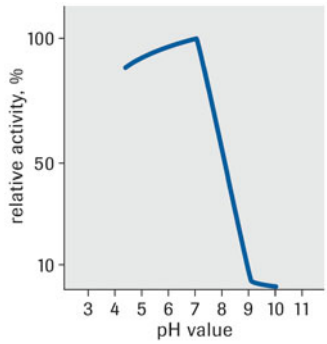
Dehydrogenase that catalyzes the interconversion of D(-)-lactate to pyruvate.

Application
Use D-Lactate Dehydrogenase (D-LDH), Grade I, in a variety of diagnostic tests, *e.g.,* in the determination of alanine aminotransferases, lactate or pyruvate. Used for the removal of pyruvate in determinations working with NADH (*i.e.*, triglycerides, lipase, aldolase, aspartate aminotransferases, glutamat dehydrogenase).

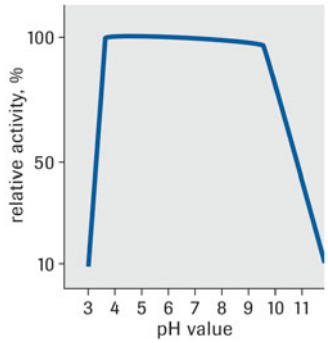
Benefits
- Rely on the proven diagnostic quality of this product.
- Benefit from the extended shelf life of this enzyme.

EC 1.1.1.28

Properties
Nomenclature: D-lactate:NAD^+ oxidoreductase
Michaelis constants (Tris maleate buffer, pH 8.0, +25°C):
D-lactate: 0.7 x 10^{-1} mol/l (NAD, 2 mmol/l)
Pyruvate: 1.2 x 10^{-3} mol/l (NADH, 0.1 mmol/l)
NADH: 7.1 x 10^{-5} mol/l (pyruvate, 20 mmol/l)
pH optimum: 7.0 (see figure)
Temperature dependence: See figure
pH stability: 4.0-10.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Lactate dehydrogenase is specific for D(-)-lactate, L(+)-lactate does not react.
Remark: Lactate dehydrogenase, Grade I is especially suited for liquid stable applications with extended shelf life requirements.



pH optimum

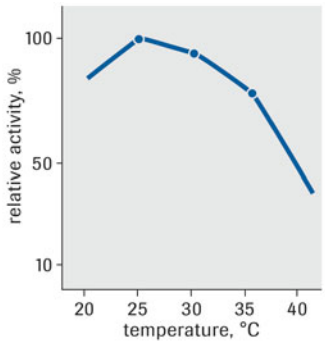


Incubation:
25°C, 60 min
pH 3.0 – 5.0:
citrate buffer, 0.2 mol/l
pH 6.0 – 8.0:
phosphate buffer,
0.2 mol/l
pH 9.0 –11.0:
glycine buffer, 0.2 mol/l
2400 U D-LDH/ml

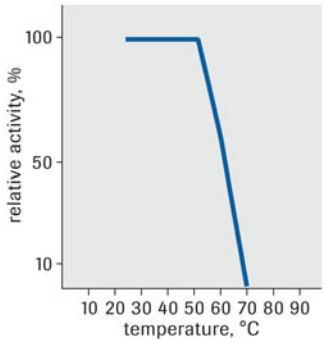
pH stability

Specification
Appearance: White to yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 6.0-7.0
Activity (+25°C, pyruvate): ≥180 U/mg lyophilizate
Specific activity: ≥450 U/mg protein
Protein (Biuret) : No limit, 0.3-0.8 mg/mg lyophilizate
Contaminants (expressed as percentage of D-Lactate Dehydrogenase

activity):
Alcohol dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.1
"NADH oxidase": ≤0.0005
Succinate dehydrogenase: ≤0.01
NH_4: ≤0.01 µmol/KU
Na (flame photometric): ≤0.5 µmol/KU
K (flame photometric): ≤0.007 µmol/KU
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



Temperature dependence



Thermal stability

Incubation:
10 min
water; pH 5.2
2400 U D-LDH/ml

For further processing only.

D-Lactate Dehydrogenase (D-LDH), Grade II

from *Lactobacillus delbrückii*, lyophilizate

Cat. No.	Pack Size
10 679 666 103	custom fill

Will be supplied as "D(-)-Lactate Dehydrogenase (D-LDH)". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of D(-)-lactate to pyruvate.

Application

Use D-Lactate Dehydrogenase (D-LDH), Grade II, in a variety of diagnostic tests, *e.g.,* in the determination of alanine aminotransferases, lactate or pyruvate. Used for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aspartate aminotransferases, glutamat dehydrogenase).

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.1.1.28

Properties

Nomenclature: D-lactate:NAD^+ oxidoreductase
Michaelis constants (Tris maleate buffer, pH 8.0, +25°C):
D-lactate: 0.7 x 10^{-1} mol/l (NAD, 2 mmol/l)
Pyruvate: 1.2 x 10^{-3} mol/l (NADH, 0.1 mmol/l)
NADH: 7.1 x 10^{-5} mol/l (pyruvate, 20 mmol/l)
pH optimum: 7.0 (see figure)
Temperature dependence: See figure
pH stability: 4.0-10.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Lactate dehydrogenase is specific for D(–)-lactate, L(+)-lactate does not react.

Specification
Appearance: White to yellowish lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 5.7-6.7
Activity (+25°C, pyruvate): ≥150 U/mg lyophilizate
Specific activity: ≥300 U/mg protein
Protein (Biuret): No limit, approximately 0.4-0.7 mg/mg lyophilizate
Contaminants (expressed as percentage of D-Lactate Dehydrogenase activity):
Alcohol dehydrogenase: ≤0.01
Glucose dehydrogenase: ≤0.01
Malate dehydrogenase: ≤0.1
Succinate dehydrogenase: ≤0.01
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

L-Lactate Dehydrogenase (L-LDH)
from pig muscle, for use of AST/GOT-Determination according to IFCC recommendations, lyophilizate

Dehydrogenase that catalyzes the interconversion of specific for L(+)-lactate to pyruvate.

Application
Use L-Lactate Dehydrogenase in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits
- Rely on the proven diagnostic quality of this product.
- Tested according to the recommendations of the International Federation of Clinical Chemistry (IFCC).

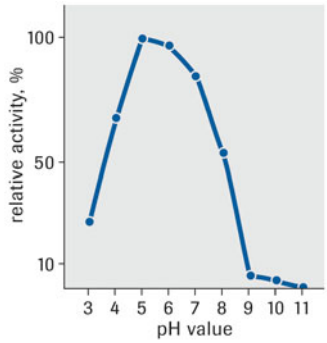
EC 1.1.1.27

Properties
Nomenclature: L-lactate:NAD^+ oxidoreductase
Molecular weight: 140 kD
Isoelectric point: 4.6
Michaelis constants (Phosphate buffer, pH 7.5; +25°C)**:**
Pyruvate: 1.5 x 10^{-4} mol/l (NADH: 0.18 mmol/l)
L-lactate: 3.3 x 10^{-3} mol/l (NAD: 0.5 mmol/l)
NADH: 1.1 x 10^{-5} mol/l (Pyruvate: 0.6 mmol/l)
NAD: 6.7 x 10^{-5} mol/l (L-lactate: 34 mmol/l)
Inhibitors: Oxamate, pyruvate (excess), oxalate, Ag^+, Hg^{2+}, Cu^{2+}
pH optimum: 3.0-7.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-8.5 (see figure)
Thermal stability: Up to +40°C (see figure)
Specificity: Lactate dehydrogenase is specific for L(+)-lactate, D(–)-lactate does not react. Glyoxylate is also a lactate dehydrogenase substrate. Apart from pyruvate some 2-oxoacids are reduced. NAD analogs (*e.g.,* APAD) react at similar rates.

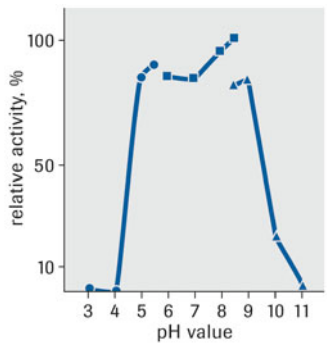
Specification
Appearance: White lyophilizate
Solubility: Clear colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 6.0-7.0
Activity (+30°C, pyruvate; according to IFCC recommendations):
for Aspartate aminotransferase (AST/GOT) determination: ≥50 U/mg

Cat. No.	Pack Size
10 254 754 103	custom fill

Will be supplied as "LDH IFCC-quality from Hog Muscle". Unit of Measure is "MU".
Additional formulation: Suspension in glycerol solution, Catalog No. 10 417 718

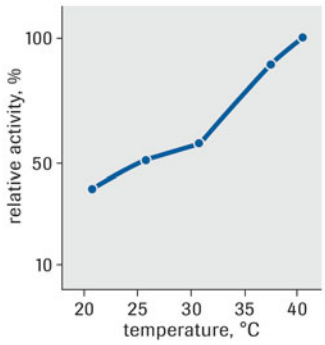


pH optimum

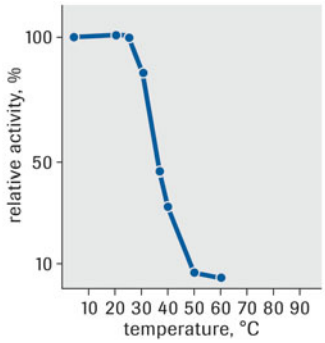


Incubation:
25°C, 6 h resp. 24 h
● pH 3.0 – 5.5:
citrate buffer, 0.1 mol/l
■ pH 5.5 – 8.5:
phosphate buffer,
0.1 mol/l
▲ pH 8.5 –11.0:
glycine buffer, 0.1 mol/l
10 U LDH/ml
pH stability

lyophilizate
for Alanine aminotransferase (ALT/GPT) determination: ≥50 U/mg lyophilizate
Activity (mean value of both determinations): ≥50 U/mg lyophilizate
Contaminants (expressed as percentage of Lactate Dehydrogenase activity, assayed according to the IFCC recommendations):
Aspartate aminotransferase (AST/GOT): ≤0.001
unspecificity of Lactate dehydrogenase: ≤0.005
Alanine aminotransferase (ALT/GPT): ≤0.001
unspecificity of Lacatae dehydrogenase: ≤0.005
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



Temperature dependence



Incubation:
10 min
Tris buffer, 0.1 mol/l;
pH approx. 7.0
834 U LDH/ml
Thermal stability

For further processing only.

L-Lactate Dehydrogenase (L-LDH)

from pig muscle, for use of AST/GOT-Determination according to IFCC recommendations, solution

Cat. No.	Pack Size
10 417 718 103	custom fill

Will be supplied as "LDH, IFCC-quality from Hog Muscle". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of specific for L(+)-lactate to pyruvate.

Application

Use L-Lactate Dehydrogenase in a in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits

- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.
- Tested according to the recommendations of the International Federation of Clinical Chemistry (IFCC).

EC 1.1.1.27

Properties

Nomenclature: L-lactate:NAD^+ oxidoreductase
Molecular weight: 140 kD
Isoelectric point: 4.6
Michaelis constants (Phosphate buffer, pH 7.5; +25°C)**:**
Pyruvate: 1.5 x 10^{-4} mol/l (NADH: 0.18 mmol/l)
L-lactate: 3.3 x 10^{-3} mol/l (NAD: 0.5 mmol/l)
NADH: 1.1 x 10^{-5} mol/l (Pyruvate: 0.6 mmol/l)
NAD: 6.7 x 10^{-5} mol/l (L-lactate: 34 mmol/l)
Inhibitors: Oxamate, pyruvate (excess), oxalate, Ag^+, Hg^{2+}, Cu^{2+}

pH optimum: 3.0-7.0 (see figure)
Temperature dependence: See figure
pH stability: 5.5-8.5 (see figure)
Thermal stability: Up to +40°C (see figure)
Specificity: Lactate dehydrogenase is specific for L(+)-lactate, D(–)-lactate does not react. Glyoxylate is also a lactate dehydrogenase substrate. Apart from pyruvate some 2-oxoacids are reduced. NAD analogs (*e.g.,* APAD) react at similar rates.

Specification

Appearance: Clear, colorless solution in glycerol, 50% (v/v), pH approximately 7
pH value: 6.5-7.5
Activity (+30°C, pyruvate, according to the IFCC recommendations): ≥9,600 U/ml solution
Specific activity: ≥480 U/mg protein
Protein (Biuret): ≥20 mg/ml solution
Glycerol: 45-55 % (v/v)
Contaminants (expressed as percentage of Lactate Dehydrogenase specific activity):
Glutamate dehydrogenase: ≤0.003
Aspartate aminotransferase (AST/GOT): ≤0.005
Alanine aminotransferase (ALT/GPT): ≤0.005
Reagent blank for determination of aspartate aminotransferase (AST/GOT): ≤0.9 mA/min
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

L-Lactate Dehydrogenase (L-LDH)
from pig muscle, suspension

Dehydrogenase that catalyzes the interconversion of specific for L(+)-lactate to pyruvate.

Application

Use L-Lactate Dehydrogenase in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.*, triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits

- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

Cat. No.	Pack Size
10 021 415 103	custom fill

Will be supplied as "Lactate Dehydrogenase (LDH), Hog Muscle".
Unit of Measure is "MU".
For further processing only.

EC 1.1.1.27

Specification

Appearance: White suspension in ammonium sulfate, 3.2 mol/l; Tris, 10 mmol/l, pH approximately 6.5
pH value: 6.0-7.0
Specific activity (+25°C, pyruvate): ≥550 U/mg protein
Protein (Biuret): ≥10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Lactate Dehydrogenase activity):
Aldolase: ≤0.001
Glutamate dehydrogenase: ≤0.01
Aspartate aminotransferase (AST/GOT): ≤0.005
Alanine aminotransferase (ALT/GPT): ≤0.005
Malate dehydrogenase: ≤0.01
Myokinase: ≤0.01
Pyruvate kinase: ≤0.001
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

L-Lactate Dehydrogenase (L-LDH), chemically modified
from pig heart, lyophilizate

Cat. No.	Pack Size
11 866 117 103	custom fill

Will be supplied as "Lactate Dehydrogenase (LDH)". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of L(+)-lactate to pyruvate.

Application
Use L-Lactate Dehydrogenase (L-LDH), chemically modified, in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits
- Take advantage of the enhanced liquid stability of this enzyme.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.27

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value: 7.1-8.1
Activity (+25°C, pyruvate): ≥25 U/mg lyophilizate
Specific activity: ≥150 U/mg protein
Protein (BCA): 0.15-0.25 mg/mg lyophilizate
Contaminants (expressed as percentage of Lactate Dehydrogenase activity):
Aspartate aminotransferase (AST/GOT): ≤0.005
Unspecificity of Lactate dehydrogenase: ≤0.05
Alanine aminotransferase (ALT/GPT): ≤0.01
Unspecificity of Lactate dehydrogenase: ≤0.05
"NADH-Oxidase": ≤0.001
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability in CAPSO (pH 9.4, at +60°C for 1 hour): ≥50%
Stability: At +2 to +8°C within specification range for 12 months.

L-Lactate Dehydrogenase (L-LDH)
from pig heart, suspension

Cat. No.	Pack Size
10 153 729 103	custom fill

Will be supplied as "Lactate Dehydrogenase (LDH), Pig Heart". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of L(+)-lactate to pyruvate.

Application
Use L-Lactate Dehydrogenase (L-LDH), in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.,* triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality.

EC 1.1.1.27

Specification
Appearance: White suspension in ammonium sulfate solution, 3.2 mol/l, pH approximately 6
pH value: 5.5-6.5
Specific activity (+25°C, pyruvate): ≥300 U / mg protein
Protein (Biuret): ≥10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l

Contaminants (expressed as percentage of Lactate Dehydrogenase activity):
ATPase: ≤0.001
Glutamate dehydrogenase: ≤0.02
Aspartate aminotransferase (AST/GOT): ≤0.005
Malate dehydrogenase: ≤0.01
Myokinase: ≤0.01
"NADH-Oxidase": ≤0.001
Pyruvate kinase: ≤0.01
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

L-Lactate Dehydrogenase (L-LDH)
from rabbit muscle, suspension

Dehydrogenase that catalyzes the interconversion of specific for L(+)-lactate to pyruvate.

Application
Use L-Lactate Dehydrogenase in a variety of diagnostic tests for the removal of pyruvate in determinations working with NADH (*i.e.*, triglycerides, lipase, aldolase, aminotransferases, glutamate dehydrogenase).

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.27

Specification
Appearance: White suspension in ammonium sulfate, 3.2 mol/l; Tris, 10 mmol/l; pH approximately 6.5
pH value: 6.0–7.0
Specific activity (+25°C, pyruvate): ≥550 U/mg protein
Protein (Biuret): ≥10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Lactate Dehydrogenase activity):
Aldolase: ≤0.001
Aspartate aminotransferase (AST/GOT): ≤0.01
Alanine aminotransferase (ALT/GPT): ≤0.01
Malate dehydrogenase: ≤0.01
Myokinase: ≤0.01
Pyruvate kinase: ≤0.00
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
10 003 557 103	custom fill

Will be supplied as "Lactate Dehydrogenase, Rabbit Muscle". Unit of Measure is "MU".
For further processing only.

Lactate 2-Monooxygenase (Lactate oxidase), Grade I

from *Aerococcus viridans*, expressed in *E. coli*, lyophilizate

Recombinant oxidoreductase that catalyzes the conversion of lactate to pyruvate.

Application

Use Lactate 2-Monooxygenase, Grade I in diagnostic tests for the determination of L-lactate.

Benefits

- Benefit from the high activity in this Grade I enzyme.
- Rely on the proven diagnostic quality of this product.

EC 1.13.12.4

Properties

Nomenclature: L-lactate:oxigen oxidoreductase
Michaelis constant: L-lactate: 5 x 10^{-4} mol/l
$V_{maximum}$: L-lactate: 0.2 mol/l
pH optimum: 6.5-7.5 (see figure)
Temperature dependence: See figure
pH stability: 6.0-9.0 (see figure)
Thermal stability: Up to +65°C (see figure)

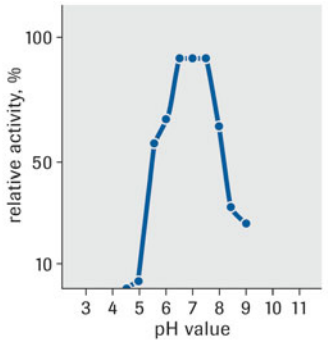
Specification

Appearance: Yellow lyophilizate
Activity: (+25°C, L-lactate): ≥40 U/mg lyophilizate
Specific activity: ≥55 U/mg protein
Contaminants (expressed as percentage of Lactate 2-Monooxygenase activity):
Catalase: ≤0.2
Glucose oxidase: ≤0.001
Pyruvate oxidase: ≤0.001
Uricase: ≤0.001
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
04 822 277 103	custom fill

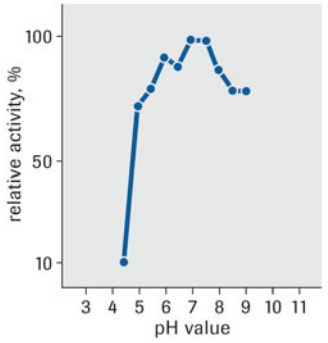
Will be supplied as "Lactat-OD, SQ, rec., lyo". Unit of Measure is "MU".

DRY ICE



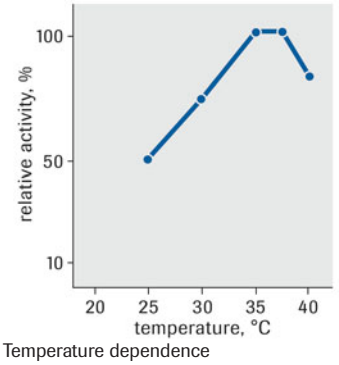
pH 4.0 – 5.5:
citrate, 0.1 mol/l
pH 5.5 – 7.5:
K-phosphate, 0.1 mol/l
pH 7.5 – 9.0:
Tris, 0.1 mol/l

pH optimum

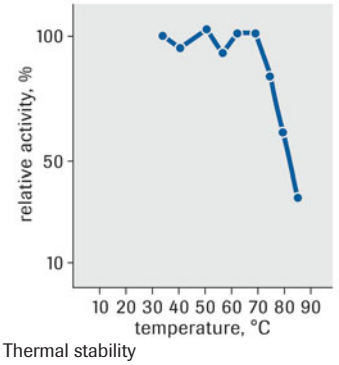


Incubation:
25°C, 3 h
pH 4.0 – 5.5:
citrate, 0.1 mol/l
pH 5.5 – 7.5:
K-phosphate, 0.1 mol/l
pH 7.5 – 9.0:
Tris, 0.1 mol/l

pH stability



Temperature dependence



Incubation:
15 min
K-phosphate buffer;
pH 7.0

Thermal stability

For further processing only.

Lactate 2-Monooxygenase (Lactate oxidase), Grade II

from *Aerococcus viridans*, expressed in *E. coli*, lyophilizate

Cat. No.	Pack Size
11 798 197 103	custom fill

Will be supplied as "Lactat-OD, rec., Lyo.". Unit of Measure is "MU".
For further processing only.

Recombinant oxidoreductase that catalyzes the conversion of lactate to pyruvate.

Application
Use Lactate 2-Monooxygenase, Grade II in diagnostic tests for the determination of L-lactate.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.13.12.4

Properties
Nomenclature: L-lactate:oxigen oxidoreductase
Michaelis constant: L-lactate: 5 x 10^{-4} mol/l
$V_{maximum}$: L-lactate: 0.2 mol/l
pH optimum: 6.5-7.5 (see figure)
Temperature dependence: See figure
pH stability: 6.0-9.0 (see figure)
Thermal stability: Up to +65°C (see figure)

Specification
Appearance: Yellow lyophilizate
Activity (+25°C, L-lactate): ≥20 U/mg lyophilizate
Specific activity: ≥55 U/mg protein
Protein (BCA): 0.3-0.7 mg/mg lyophilizate
Contaminants (expressed as percentage of Lactate 2-Monooxygenase activity):
Catalase: ≤0.2
Glucose oxidase: ≤0.001
Pyruvate oxidase: ≤0.001
Uricase: ≤0.001
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Lactate 2-Monooxygenase (Lactate oxidase)

from *Pediococcus* species, lyophilizate

Cat. No.	Pack Size
10 980 927 103	custom fill

Will be supplied as "Lactate Qxidase from Pediococcus species". Unit of Measure is "kU".
DRY ICE
For further processing only.

Oxidoreductase that catalyzes the conversion of lactate to pyruvate.

Application
Use Lactate 2-Monooxygenase in diagnostic tests for the determination of lactate.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.13.12.4

Specification
Appearance: Yellow lyophilizate
Activity (25°C, L-lactate): ≥20 U/mg lyophilizate
Specific activity: ≥55 U/mg protein
Protein (Lowry): 0.2-0.4 mg/mg lyophilizate
Stability: At -15 to -25°C within specification range for 18 months. Store dry.

Lipase
from porcine pancreas, lyophilizate

Cat. No.	Pack Size
10 410 551 103	custom fill

Will be supplied as "Lipase from Porcine Pancreas". Unit of Measure is "kU".
For further processing only.

Lipolytic enzyme that hydrolyzes triglycerides.

Application
Use Lipase in diagnostic tests for the determination of triglycerides in combination with Colipase, Catalog No. 10 204 307 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.1.1.3

Specification
Appearance: White lyophilizate, stabilized
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value: 7.0-8.0
Activity: ≥300 U/mg lyophilizate
Contaminants (expressed as percentage of Lipase activity):
Proteases: ≥85
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Lipoprotein Lipase
from *Pseudomonas* species, lyophilizate

Cat. No.	Pack Size
10 734 284 103	custom fill

Will be supplied as "Lipoprotein Lipase from Pseudomon.spec.". Unit of Measure is "MU".

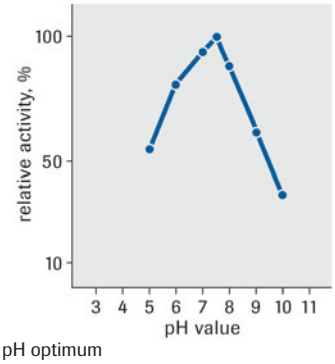
Enzyme that hydrolyzes triglycerides into three free fatty acids and glycerol.

Application
Use Lipoprotein Lipase in diagnostic tests for the determination of triglycerides together with Glycerol Kinase, Catalog No. 10 539 937 103 or 11 499 530 103 and Glycerol-3-phosphate Dehydrogenase, Catalog No. 11 654 730 103 or 11 582 003 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.1.1.34

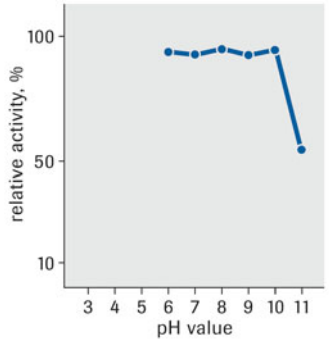
Properties
Nomenclature: Triacylglycero-protein acylhydrolase
Molecular weight: 47 kD
Effectors: Hg^{2+}, Ag^{+}, Cr^{2+}, Sn^{2+}, Cu^{2+} and ionic detergents inhibit. Mg^{2+}, sodium cholate and BSA stabilize the enzyme. 4-Chloromercuribenzoate (2 mmol/l), monoiodoacetate (2 mmol/l), NaF (20 mmol/l), NaN_3 (20 mmol/l), EDTA (5 mmol/l) and 2-phenanthroline (2 mmol/l) do not affect the enzyme activity while SDS (0.1% (w/v)) is inactivating.
pH optimum: 7.5 (see figure)
pH stability: 6.0-10.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Lipoprotein Lipase has both lipolytic and sterol ester hydrolytic activities. It hydrolyzes triacylglycerols in chylomicrons, lipoproteins and diacylglycerols. With human plasma as substrate triglycerides are hydrolyzed more rapidly than cholesterol esters. The effects of pH and ionic strength on the enzymatic activity are somewhat different between the hydrolysis of triglyceride



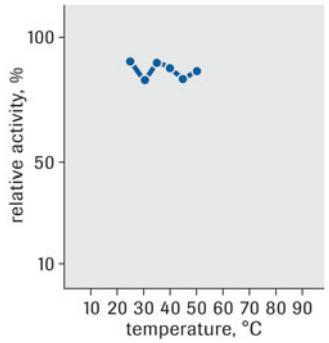
pH optimum

and of cholesterol ester depending on the different states of these substrates in the plasma or the transfer of the reaction products at the interface of substrates.
Lipolytic activity (Substrate, Number of C-atoms to number of double bonds, Relative rate):
olive oil: 94%
triolein (18:1): 100%
tripalmitin (16:0): 2%
trimyristin (14:0): 7%
trilaurin (12:0): 4%
tricaprin (10:0): 17%
tricaprylin (8:0): 64%
tricaproin (6:0): 2%
tributyrin (4:0): 2%
tripropionin (3:0): 2%
triacetin (2:0): 1%

Specification
Appearance: Brownish lyophilizate
Solubility: Clear, brown solution in water (c=50 mg/ml)
Activity (+25°C, cholesterol oleate): ≥100 U/mg lyophilizate
Contaminants (expressed as percentage of Lipoprotein Lipase activity):
ATPase: ≤0.005
Catalase: ≤1.0
Glycerokinase: ≤0.001
Glucose oxidase: ≤0.001
Hexokinase: ≤0.005
"NADH oxidase": ≤0.001
Uricase: ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



pH stability



Thermal stability

For further processing only.

Lipoprotein Lipase, chemically modified
from *Pseudomonas* species, lyophilizate

Cat. No.	Pack Size
11 145 991 103	custom fill

Will be supplied as "Lipoprotein Lipase Modified". Unit of Measure is "MU".

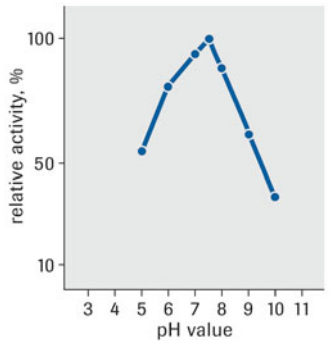
Enzyme that hydrolyzes triglycerides into three free fatty acids and glycerol.

Application
Use Lipoprotein lipase in diagnostic tests for the determination of triglycerides together with Glycerol Kinase, Catalog Nos. 10 539 937 103 or 11 499 530 103 and Glycerol-3-phosphate Dehydrogenase, Catalog Nos. 11 654 730 103 or 11 582 003 103.

Benefits
- Take advantage of the enhanced liquid stability of this enzyme.
- Rely on the proven diagnostic quality of this product.

EC 3.1.1.34

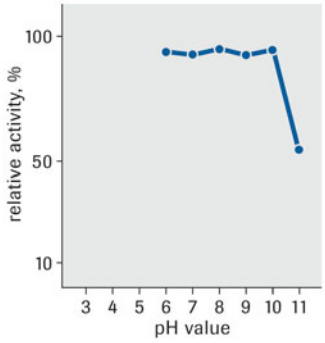
Properties
Nomenclature: Triacylglycero-protein acylhydrolase
Molecular weight: 47 kD
Effectors: Hg^{2+}, Ag^{+}, Cr^{2+}, Sn^{2+}, Cu^{2+} and ionic detergents inhibit. Mg^{2+}, sodium cholate and BSA stabilize the enzyme. 4-Chloromercuribenzoate (2 mmol/l), monoiodoacetate (2 mmol/l), NaF (20 mmol/l), NaN_3 (20 mmol/l), EDTA (5 mmol/l) and 2-phenanthroline (2 mmol/l) do not affect the enzyme activity while SDS (0.1% (w/v)) is inactivating.



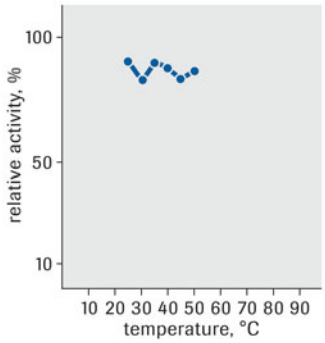
pH optimum

pH optimum: 7.5 (see figure)
pH stability: 6.0-10.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Lipoprotein Lipase has both lipolytic and sterol ester hydrolytic activities. It hydrolyzes triacylglycerols in chylomicrons, lipoproteins and diacylglycerols. With human plasma as substrate triglycerides are hydrolyzed more rapidly than cholesterol esters. The effects of pH and ionic strength on the enzymatic activity are somewhat different between the hydrolysis of triglyceride and of cholesterol ester depending on the different states of these substrates in the plasma or the transfer of the reaction products at the interface of substrates.
Lipolytic activity (Substrate, Number of C-atoms to number of double bonds, Relative rate):
olive oil: 94%
triolein (18:1): 100%
tripalmitin (16:0): 2%
trimyristin (14:0): 7%
trilaurin (12:0): 4%
tricaprin (10:0): 17%
tricaprylin (8:0): 64%
tricaproin (6:0): 2%
tributyrin (4:0): 2%
tripropionin (3:0): 2%
triacetin (2:0): 1%
Remark: Chemically modified Lipoprotein Lipase (LPL) is more hydrophilic than native LPL. Carryover effect is therefore reduced.

Specification
Appearance: Brownish lyophilizate
Solubility: Clear, brown solution in water (c=50 mg/ml)
Activity (+25°C, cholesterol oleate): ≥10 U/mg lyophilizate
Contaminants (expressed as percentage of Lipoprotein Lipase activity):
ATPase: ≤0.005
Catalase: ≤1.0
Glycerokinase: ≤0.001
Hexokinase: ≤0.005
"NADH oxidase": ≤0.001
Uricase: ≤0.005
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



Incubation:
25°C, 60 min
pH 6.0 – 8.0:
phosphate buffer,
0.7 mol/l
pH 9.0 –11.0:
glycine buffer, 2.1 mol/l
50 U LPL/ml
pH stability



Incubation:
30 min
Tris buffer, 0.1 mol/l;
pH 7.7
50 U LPL/ml
Thermal stability

For further processing only.

Lysozyme
from hen egg white, crystalline powder

Glucosidic bond hydrolyzing enzyme

Application
Use Lysozyme for bacteriolysis, preparation of protoplasts and sample preparation prior to isolation of nucleic acids. It can also be used in pharmalogical applications and food industry.

Benefits
Rely on the proven diagnostic quality of this product.

Product Description
Lysozyme from chicken egg. During purification and processing of this enzyme, steps included pH treatment at pH 3.5 or less for at minimum 30 minutes.

EC 3.2.1.17

Cat. No.	Pack Size
10 153 516 103	custom fill

Will be supplied as "Lysozyme (Muramidase) from Hen Egg White". Unit of Measure is "g".
For further processing only.

Specification
Appearance: White, crystalline powder
Activity (+25°C, with *Micrococcus luteus*): ≥12,200 U/mg substance
Activity (+25°C, with *M. luteus*, previous Roche-substrate; calculated): ≥50,000 U/mg substance
Proteases: ≤0.5 U/mg substance
Stability: At +2 to +8°C within specification range for 36 months. Store dry.

Malate Dehydrogenase
from pig heart, lyophilizate

Cat. No.	Pack Size
10 200 387 103	custom fill

Will be supplied as "Malate Dehydrogenase, Pig Heart (Mitochon.)". Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of malate to oxaloacetate.

Application
Use Malate Dehydrogenase in diagnostic tests for the determination of aspartate aminotransferase or in applications for citric and acetic acid testing.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.1.1.37

Specification
Appearance: White lyophilizate, stabilized
Solutbility: Clear, colorless solution in water (c=10 mg/ml)
pH value: 7.0-8.0
Activity (+25°C, oxaloacetate): ≥70 U/mg lyophilizate
Contaminants (expressed as percentage of Malate Dehydrogenase activity):
Fumarase: ≤0.01
Aspartate aminotransferase (AST/GOT): ≤0.002
Lactate dehydrogenase: ≤0.01
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Malate Dehydrogenase, chemically modified
from pig heart, lyophilizate

Cat. No.	Pack Size
11 866 109 103	custom fill

Will be supplied as "MDH, Lyo., mod.". Unit of Measure is "MU".
DRY ICE
For further processing only.

Dehydrogenase that catalyzes the interconversion of malate to oxaloacetate.

Application
Use Malate Dehydrogenase in diagnostic tests for the determination of aspartate aminotransferase or in applications for citric and acetic acid testing.

Benefits
- Take advantage of the enhanced liquid stability
- Rely on the proven diagnostic quality of this product.

EC 1.1.1.37

Specification
Appearance: White lyophilizate
pH value: 7.5-8.5
Activity (+25°C, oxaloacetate): ≥20 U/mg lyophilizate
Specific activity: ≥400 U/mg protein
Protein (BCA): ≥0.02 mg/mg lyophilizate
Contaminants (expressed as percentage of Malate Dehydrogenase activity):

Aspartate aminotransferase (AST/GOT): ≤0.01
"NADH-Oxidase": ≤0.005
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 18 months.

Malate Dehydrogenase, IFCC Quality
from pig heart, lyophilizate

Dehydrogenase that catalyzes the interconversion of malate to oxaloacetate.

Application
Use Malate Dehydrogenase in diagnostic tests for the determination of aspartate aminotransferase or in applications for citric and acetic acid testing.

Benefits
- Rely on the proven diagnostic quality of this product.
- Tested according to the recommendations of the International Federation of Clinical Chemistry (IFCC).

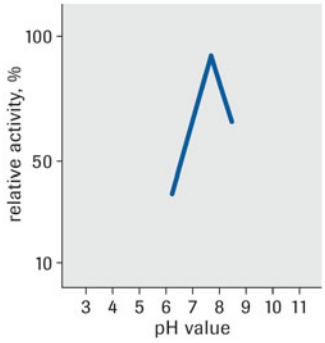
EC 1.1.1.37

Properties
Nomenclature: L-malate:NAD^+ oxidoreductase
Molecular weight: 70 kD
Isoelectric point: 6.1-6.4
Michaelis constants (Phosphate buffer, 95 mmol/l, pH 8.3, +25°C):
L-malate: 4.0 x 10^{-4} mol/l
L-tartrate: 9.0 x 10^{-3} mol/l
meso-tartrate: 1.2 x 10^{-3} mol/l
oxaloacetate: 3.3 x 10^{-5} mol/l
Inhibitors: Iodinated compounds such as iodine cyanide, thyroxine and molecular iodine, phenols, 1,10-phenanthroline, 8-hydroxyquinoline, sulfide, nicotinic acidamide, adenine, AMP, ATP; oxaloacetate (excess).
Activators: Phosphate, arsenate, Zn^{2+}
pH optimum: 7.5 (see figure)
Temperature dependence: See figure
pH stability: 7.0-9.0 (see figure)
Thermal stability: Up to +40°C (see figure)
Specificity: L-configuration of malate and tartrate. NAD can be replaced by its analogs, but not by NADP.

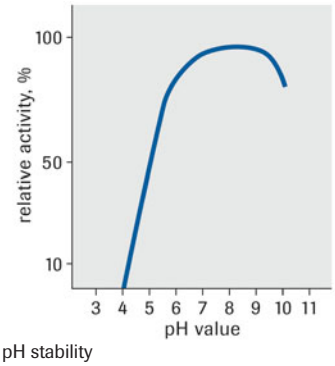
Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
Activity (+30°C, oxaloacetate; according to the IFCC recommendations): ≥70 U/mg lyophilizate
Contaminants (expressed as percentage of Malat Dehydrogenase activity; assayed according to the IFCC recommendations):
Aspartate aminotransferase (AST/GOT): ≤0.001
Alanine aminotransferase (ALT/GPT): ≤0.001
Glutamate dehydrogenase: ≤0.005
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 267 155 103	custom fill

Will be supplied as "MDH IFCC-quality, Pig Heart (Mitochon.)". Unit of Measure is "MU".

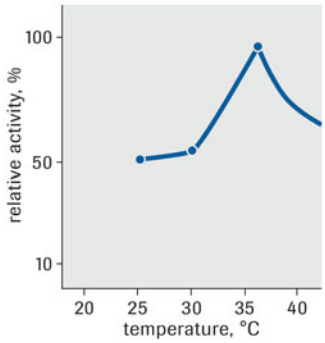


pH optimum

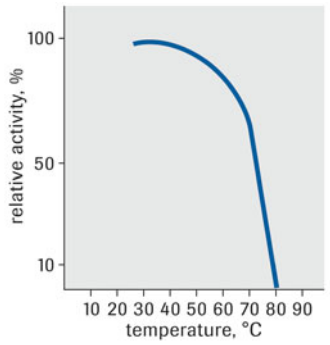


Incubation:
25°C, 180 min
pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
pH 6.0 – 8.0:
phosphate buffer,
0.1 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.1 mol/l
1200 U MDH/ml

pH stability



Temperature dependence



Thermal stability

For further processing only.

Malate Dehydrogenase, IFCC Quality
from pig heart, solution

Cat. No.	Pack Size
10 417 726 103	custom fill

Will be supplied as "MDH, IFCC-quality, Pig Heart (Mitochon.)".
Unit of Measure is "MU".
For further processing only.

Dehydrogenase that catalyzes the interconversion of malate to oxaloacetate.

Application
Use Malate Dehydrogenase in diagnostic tests for the determination of aspartate aminotransferase or in applications for citric and acetic acid testing.

Benefits
- Apply this ready-to-use enzyme directly in your diagnostic test.
- Rely on the proven diagnostic quality of this product.
- Tested according to the recommendations of the International Federation of Clinical Chemistry (IFCC)

EC 1.1.1.37

Properties
Nomenclature: L-malate:NAD^+ oxidoreductase
Molecular weight: 70 kD
Isoelectric point: 6.1-6.4
Michaelis constants (Phosphate buffer, 95 mmol/l, pH 8.3, +25°C):
L-malate: 4.0 x 10^{-4} mol/l
L-tartrate: 9.0 x 10^{-3} mol/l
meso-tartrate: 1.2 x 10^{-3} mol/l
oxaloacetate: 3.3 x 10^{-5} mol/l
Inhibitors: Iodinated compounds such as iodine cyanide, thyroxine and molecular iodine, phenols, 1,10-phenanthroline, 8-hydroxyquinoline, sulfide, nicotinic acidamide, adenine, AMP, ATP; oxaloacetate (excess).
Activators: Phosphate, arsenate, Zn^{2+}
pH optimum: 7.5 (see figure)
Temperature dependence: See figure
pH stability: 7.0-9.0 (see figure)
Thermal stability: Up to +40°C (see figure)
Specificity: L-configuration of malate and tartrate. NAD can be replaced by its analogs, but not by NADP.

Specification
Appearance: Clear, colorless solution in glycerol (50% (v/v))
pH value: 6.5-7.5
Specific activity (+30°C, oxaloacetate): ≥900 U/mg protein
Protein (Biuret): ≥10 mg/ml
Contaminants (expressed as percentage of Malate Dehydrogenase activity):
Aspartate aminotransferase (AST/GOT): ≤0.005

Alanine aminotransferase (ALT/GPT): ≤0.005
Glutamate dehydrogenase: ≤0.003
Reagent blank for determination of aspartate aminotransferase (AST/GOT): ≥0.009 (δA_{334}/10 minutes)
SVD free: Corresponds to specification
pH 5.5 treatment (for at minimum 30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

N-Methylhydantoinase (ATP-hydrolyzing)

from *Arthrobacter* species, expressed in *E. coli*, lyophilizate

Cat. No.	Pack Size
11 288 555 103	custom fill

Will be supplied as "N-Methylhydantoin Hydrolase". Unit of Measure is "kU".

DRY ICE

For further processing only.

Hydrolase for creatinine determination that uses ATP to catalyze the conversion of N-methylhydantoin to N-carbomoylsarcosine.

Application

Use N-Methylhydantoinase (ATP-hydrolyzing) in diagnostic tests for the determination of creatinine in combination with Creatinine Deaminase Catalog No. 11 330 764 103, N-Carbamoylsarcosine Amidase, Catalog No. 11 248 847 103 and Sarcosine Oxidase, Catalog No. 11 378 856 103.

Benefits

Rely on the proven diagnostic quality of this product.

EC 3.5.2.14

Specification

Appearance: White lyophilizate
Solubility. Clear, colorless solution in water (c=10 mg/ml, +25 °C)
pH value (c=100 mg/ml in water): 7.8-8.8
Activity (+25°C, N-methylhydantoin): 0.6-1.0 U/ mg lyophilizate
Protein (Biuret): 20-43 mg/100 mg lyophilizate
Contaminants (expressed as percentage of N-Methylhydantoinase activity):
Creatinase: ≤0.013
Creatininase: ≤0.01
Catalase: ≤100
Uricase: ≤0.01
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Protect from light.

NAD(P)H Dehydrogenase (quinone) (Diaphorase)

from pig heart, suspension

Cat. No.	Pack Size
10 153 427 103	custom fill

Will be supplied as "Diaphorase, Grade I from Pig Heart". Unit of Measure is "g".
For further processing only.

Dehydrogenase that catalyzes the oxidation of dihydrolipoyl groups and has diaphorase activity.

Application

Use the diaphorase activity of NAD(P)H Dehydrogenase (quinone) for the determination of NAD(P)H and many dehydrogenases when coupled with various dyes which act as hydrogen acceptors from NAD(P)H, *e.g.* tetrazolium salts.

Benefits

Rely on the proven diagnostic quality of this product.

EC 1.6.5.2

Specification
Appearance: Yellow suspension in ammonium sulfate, 3.2 mol/l
pH value: 5.5-6.5
Specific activity (+25°C, lipoate): ≥25 U/mg protein
Protein (Biuret): 10±1 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
SVD free: Corresponds to specification
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At +2 to +8°C within specification range for 12 months.

Nitrate Reductase
from *Aspergillus* species, lyophilizate

Oxidoreductase that catalyzes the reduction of nitrate to nitrite.

Application
Use Nitrate Reductase in diagnostic tests for the determination of nitrate.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.6.6.2

Specification
Appearance: Yellow lyophilizate
Activity (+25°C, nitrate): ≥0.4 U/mg lyophilizate
Specific activity: ≥10 U/mg protein
Protein (Biuret): No limit
Contaminants (expressed as percentage of Nitrate Reductase activity):
Alcohol dehydrogenase (NADPH dependent): ≤0.8
"NADPH oxidase": ≤0.5
Nitrite reductase: ≤0.15
Stability: At -15 to-25°C within specification range for 12 months. Store dry. Protect from light.

Cat. No.	Pack Size
10 918 202 103	custom fill

Will be supplied as "Nitrate Reductase (Aspergillus species)". Unit of Measure is "kU".

DRY ICE

For further processing only.

Oxalate Oxidase
from barley seedings, lyophilizate

Cat. No.	Pack Size
10 570 524 103	custom fill

Will be supplied as "Oxalate Oxidase from Barley Seedlings". Unit of Measure is "U".

DRY ICE

For further processing only.

Oxidoreductase that catalyzes the interconversion of oxalate to carbon dioxide and hydrogen peroxide.

Application
Use Oxalate Oxidase in diagnostic tests for the determination of oxalate in combination with Formate Dehydrogenase, Catalog No. 10 204 226 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 1.2.3.4

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=40 mg/ml)
Activity (+37°C, oxalate): ≥0.25 U/mg lyophilizate
Specific activity: ≥5 U/mg protein
Protein (Biuret): No limit
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Peroxidase (POD), Grade II
from horse radish, lyophilizate

Cat. No.	Pack Size
11 378 783 103	custom fill

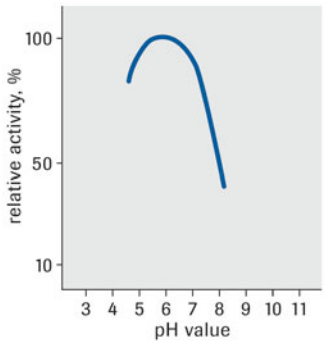
Will be supplied as "Peroxidase (POD), Grade II, Horse-radish". Unit of Measure is "MU".

Application
Use Peroxidase (POD), Grade II, for the oxidation of reduced dyes in the indicator reaction of many diagnostic tests, *e.g.,* for the determination of blood glucose, triglycerides or lactate. It may also be used as a marker enzyme for enzyme immunoassays (EIA).

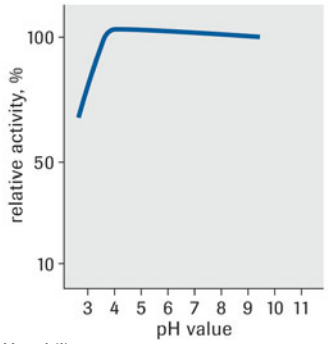
Benefits
Rely on the proven diagnostic quality of this enzyme.

EC 1.11.1.7

Properties
Nomenclature: Donor:hydrogen-peroxide oxidoreductase
Molecular weight: 40 kD
Structure: Glycoprotein with one mole of protoheme IX
Isoelectric point: 7.2
Rate constants:
a) Hydrogen acceptors:
H_2O_2 9 x 10^8 [l x mol^{-1} x s^{-1}]
methyl peroxide 1.5 x 10^6 [l x mol^{-1} x s^{-1}]
ethyl peroxide 3.6 x 10^6 [l x mol^{-1} x s^{-1}]
b) Hydrogen donors: Many
Inhibitors: Cyanide, sulfide, fluoride, azide, hydroxylamine, hydroxyl ions
Activators: Peroxidation of o-dianisidine is accelerated by ammonia, pyridine, imidazole at pH values >7.0
pH optimum: 6.0-6.5 (see figure)
Temperature dependence: See figure
pH stability: 4.0-10.0 (see figure)
Thermal stability: Up to +40°C (see figure)
Specificity: Peroxidase is specific for the hydrogen acceptor; only H_2O_2, methyl- and ethylperoxides are active. In contrast the enzyme is not specific for the hydrogen donor. A large number of phenols, aminophenols, diamines, indophenols, leucocyte dyes, ascorbate and several amino acids react.



pH optimum

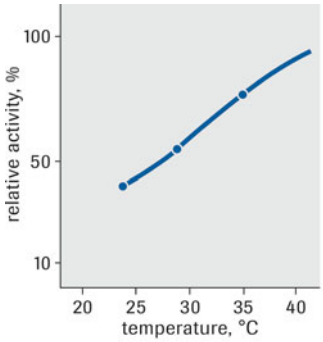


pH stability

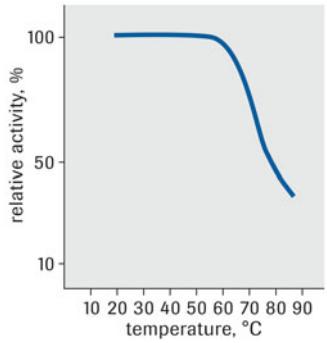
Incubation:
25°C, 180 min
pH 3.0 – 5.0:
citrate buffer, 0.1 mol/l
pH 6.0 – 8.0:
phosphate buffer,
0.1 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.1 mol/l
200 U POD/ml

Specification

Appearance: Red-brown lyophilizate
Solubility: Clear, red-brown solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 6.6-7.6
Activity (+25°C, guaiacol, H_2O_2): ≥200 U/mg lyophilizate
Purity number (A_{403}/A_{275}): 2.0-3.5
A_{500} (100 U/ml): ≤0.120
Contaminants (expressed as percentage of Peroxidase activity):
ATPase: ≤0.001
Catalase: ≤0.7
Contaminating oxidases: ≤0.00005
Phosphatase, acidic: ≤0.001
Glucose: ≤0.25 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Keep tightly sealed.



Temperature dependence



Incubation:
10 min
phosphate buffer,
0.1 mol/l; pH 7.0
2 000 U POD/ml

Thermal stability

For further processing only.

Phosphogluconate Dehydrogenase (decarboxylating)

from yeast, lyophilizate

Cat. No.	Pack Size
11 126 482 103	custom fill

Will be supplied as "6-PGDH from Yeast, Lyophilizate". Unit of Measure is "kU".

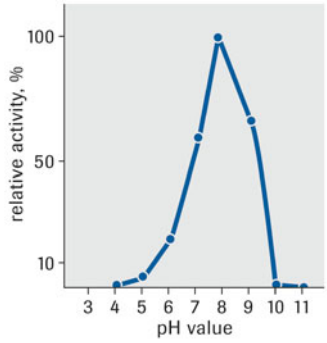
Dehydrogenase that catalyzes the formation of ribulose 5-phosphate from 6-phosphogluconate.

Application

Use Phosphogluconate Dehydrogenase in diagnostic tests for the determination of creatine kinase or glucose in the combination with Hexokinase, Catalog Nos. 11 119 796 103 or 10152 676 103, Glucose-6-phosphate Dehydrogenase, Catalog Nos. 10 186 783 103,11 389 343 103, 11 293 206 103 or 10 190 454, and 6-Phosphogluconolactonase, Catalog No. 11 373 129 103.

Benefits

Rely on the proven diagnostic quality of this product.



pH optimum

EC 1.1.1.44

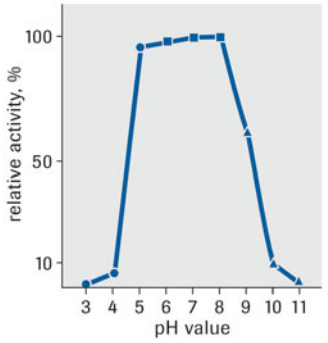
Properties

Nomenclature: 6-phospho D-gluconate:$NADP^+$ 2-oxidoreductase (decarboxylating)
Molecular weight: 150 kD (native), 47 kD (SDS-PAGE)
Michaelis constants (TEA, 0.1 mol/l, pH 7.6, +25°C):
6-Phosphogluconate: 7.1 x 10^{-5} mol/l
NADP: 1.3 x 10^{-4} mol/l
Inhibitor constant (Phosphate buffer, pH 7.5):
Pyridoxal-5-P: 4.3 x 10^{-5} mol/l competitive
Inhibitors: Pyridoxal-5-P, iodoacetate and 4-hydroxymercuribenzoate
Activators: Chelators (EDTA, cysteine) plus metal ions (Mg^{2+}); NaCl (0.2

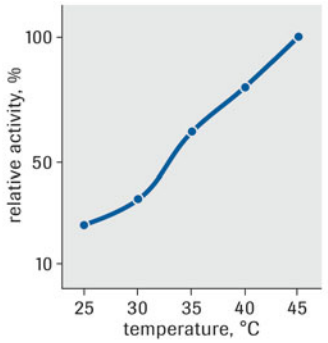
mol/l), KCl (0.2 mol/l).
pH optimum: 7.8 (see figure)
Temperature dependence: See figure
pH stability: 5.0-8.0 (see figure)
Thermal stability: Up to +45°C (see figure)
Specificity: Phosphogluconate dehydrogenase is specific for NADP; NAD does not react.

Specification

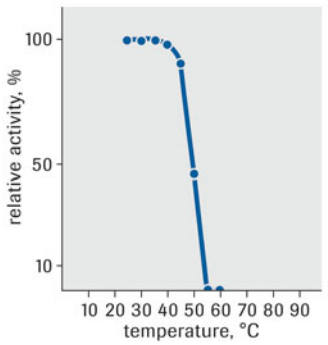
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=10 mg/ml)
pH value (c=10 mg/mlin water): 7.0-8.0
Protein (Biuret): 0.08-0.16 mg/mg lyophilizate
Activity (+25°C, gluconate-6-P): ≥2 U/mg lyophilizate
Specific activity: ≥12 U/mg protein
Contaminants (expressed as percentage of 6-Phosphogluconate Dehydrogenase activity):
Creatine kinase: ≤0.006
G6P-DH: ≤0.01
Glutathione reductase: ≤0.01
Hexokinase: ≤0.01
Phophoglucose isomerase: ≤0.03
Stability: At +2 to +8°C within specification range for 12 months. Store dry.



pH stability



Temperature dependence



Thermal stability

For further processing only.

6-Phosphogluconolactonase
from *Leuconostoc mesenteroides*, lyophilizate

Hydrolase that catalyzes the conversion of 6-phosphogluconolactone to 6-phosphogluconate.

Application

Use 6-Phosphogluconolactonase in diagnostic tests for the determination of creatine kinase or glucose in the combination with Hexokinase, Catalog Nos. 11 119 796 103 or 10152 676 103, Glucose-6-phosphate Dehydrogenase, Catalog Nos. 10 186 783 103, 11 389 343 103, 11 293 206 103 or 10 190 454 103, and Phosphogluconate Dehydrogenase, Catalog No. 11 126 482 103.

Cat. No.	Pack Size
11 373 129 103	custom fill

Will be supplied as "6-Phosphogluconolactonase". Unit of Measure is "kU".

DRY ICE

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.1.1.31

Properties

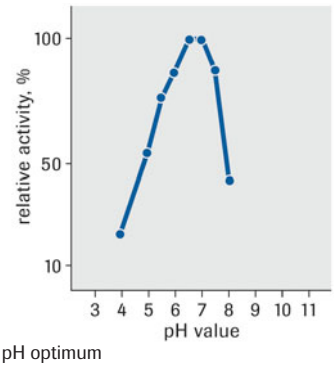
Nomenclature: 6-phosphogluconolactonase
Molecular weight: 38 kD (SDS)
Isoelectric point: 6.0
Michaelis constants (Mes buffer, pH 6.5; +25°C):
6-Phosphogluconalactone: $<1 \times 10^{-7}$ mol/l
Inhibitors: $(NH_4)_2SO_4$ (> 20 mmol/l), Mg^{2+} (>10 mmol/l), NaCl (>10 mmol/l). The enzyme is not inhibited by Cu^{2+}, Zn^{2+}, EDTA, 5.5'-dithiobis-2-nitrobenzoic acid, octanol (0.01%), Triton X-100 (1%) and Thesit (1%).
pH optimum: 6.0-7.5 (see figure)
Temperature dependence: See figure
pH stability: 7.0-9.0 (at +4°C, see figure)
Thermal stability: Up to +50°C (see figure)
Stability at different ionic strength: See figure
Specificity: 6-Phosphogluconolactone 100%, gluconolactone 0.5%

Specification

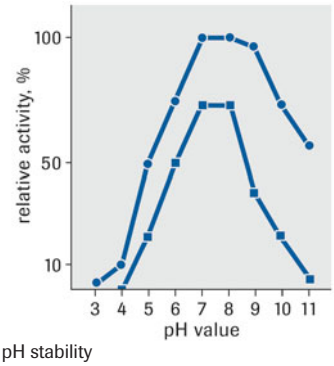
Appearance: White lyophilizate
Activity (+25°C, 6-phosphogluconolactone): ≥50 U/mg lyophilizate
Contaminants (expressed as percentage of 6-Phosphogluconolactonase activity):
Creatine kinase: ≤0.001
G6P-DH: ≤0.02
Myokinase: ≤0.001
"NADPH oxidase": ≤0.001
6- Phosphogluconate dehydrogenase: ≤0.01
Function testing (with G6P-DH, reaction time up to 5 minutes): ≥98%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Literature

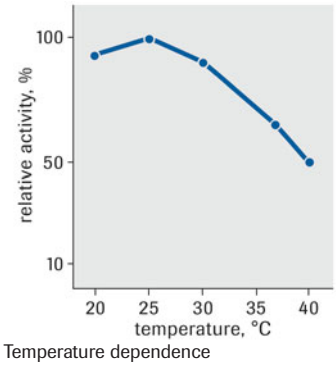
1) H.P. Bauer, T. Shihari, J.C: Jochim, H.W. Hofer, Europ. J. Biochem. ***133***, 163–168 (1983)2) R.K. Scopes, FEBS Lett. ***193/2***, 185–188 (1985)
3) R. Khanna, A.R. Data, J.L. Rosner, Plasmid ***17***, 76–82 (1987)
4) R.D. Moir, G.B. Stokes, Biochem. J. ***256***, 69–73 (1988)
5) R. Vormbrock, R. Helger, Enzyme ***38/1***, 20–21 (1987)



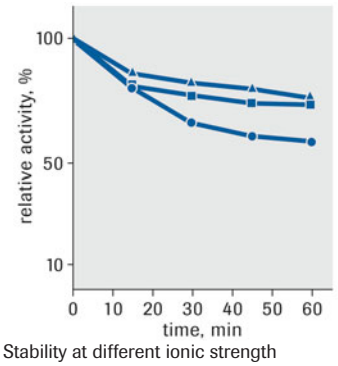
pH optimum



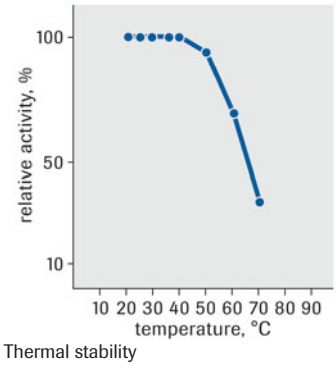
Incubation:
● 4°C, 24 h
■ 25°C, 24 h
pH 3.0 – 5.0:
citrate buffer, 0.05 mol/l
pH 6.0 – 8.0:
phosphate buffer, 0.05 mol/l
pH 9.0 – 11.0:
glycine buffer, 0.05mol/l
1 U 6-PGL/ml
pH stability



Temperature dependence



Incubation:
47°C
K-phosphate buffer,
● 0.02 mol/l
■ 0.1 mol/l
▲ 0.5 mol/l
pH 7.5
50 U 6-PGL/ml
Stability at different ionic strength



Incubation:
10 min
K-phosphate buffer,
50 mmol/l; pH 7.5
1 U 6-PGL/ml
Thermal stability

For further processing only.

Pyruvate Kinase

from *Bacillus stearothermophilus*, lyophilizate

Application

Use Pyruvate Kinase to catalyze the transfer of a phosphate group from phosphoenolpyruvate (PEP) to ADP, *e.g.,* for the enzymatic determination of potassium or triglycerides.

Benefits

Rely on the proven diagnostic quality of this product.

EC 2.7.1.40

Specification

Appearance: White lyophilizate
Solubilty: Clear, colorless solution in water (c=10 mg/ml)
pH value (+25°C, c=10 mg/ml): 7.6-8.7
Activity (+37°C, PEP): ≥120 U/mg lyophilized material
Specific activity: ≥150 U/mg protein
Protein (Biuret): 0.55-0.95 mg/mg lyophilizate
Contaminants (expressed as percentage of Pyruvate Kinase activity):
"NADH oxidase" (dA_{365}, 48 hours): ≤0.060
Na (flame photometric): ≤0.60 mmol/KU
K (flame photometric): ≤30 mmol/KU
NH_4 (enzymatically): ≤0.13 mg/KU
Mg (AAS): ≤50 mmol/KU
Mn (AAS): ≤2.4 mmol/KU
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
11 462 652 103	custom fill

Will be supplied as "PK, Bacillus stearothermoph., Lyo.". Unit of Measure is "MU".

Contents

100 mg lyophilized material contains 60 mg protein and 40 mg Tris

For further processing only.

Pyruvate Kinase
from rabbit muscle, suspension

Application
Use Pyruvate Kinase to catalyze the transfer of a phosphate group from phosphoenolpyruvate (PEP) to ADP, *e.g.*, for the enzymatic determination of potassium or triglycerides.

Benefits
Rely on the proven diagnostic quality of this product.

EC 2.7.1.40

Specification
Appearance: White suspension in ammonium sulfate, 3.2 mol/l, pH approximately 6
pH value: 5.5 to 6.5
Activity (+25°C, PEP): ≥2000 U/ml solution
Specific activity: ≥200 U/mg protein
Protein (Biuret): ≥10 mg/ml
Ammonium sulphate: 3.2±0.2 mol/l
Contaminants (expressed as percentage of Pyruvate Kinase activity):
ATPase: ≤0.002
Enolase: ≤0.01
Glycerokinase: ≤0.001
Hexokinase: ≤0.002
Lactate dehydrogenase: ≤0.01
Myokinase: ≤0.01
"NADH oxidase": ≤0.002
Glycerol (enzymatically): ≤10 µg/10 mg
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
10 005 533 103	custom fill

Will be supplied as "Pyruvate Kinase (PK) from Rabbit Muscle".
Unit of Measure is "MU".
For further processing only.

Pyruvate Oxidase

from *E.coli* overproducer, lyophilizate

Recombinant oxidoreductase that catalyzes the interconversion of pyruvate to acetyl phosphate.

Application

Use Pyruvate Oxidase in a variety of diagnostic tests, such as for the determination of pyruvate, lactate or aminotransferases.

Benefits

Rely in the proven diagnostic quality of this product.

EC 1.2.3.3

Specification

Appearance: Yellow lyophilizate
Solubility: Clear, yellowish solution in potassium phosphate buffer, 0.1 M, pH 6.5 (c=10 mg/ml)
Activity (+25°C, pyruvate, O_2, P_i): ≥1.5 U/mg lyophilizate
Specific activity: ≥3 U/mg protein
Protein (Biuret):≥0.4 mg/mg lyophilizate
Contaminants (expressed as percentage of Pyruvate Oxidase activity):
ATPase: No limit
Glucose oxidase: ≤0.001
Aspartate aminotransferase (AST/GOT): ≤0.01
Alanine aminotransferase (ALT/GPT): ≤0.01
apo-Alanine aminotransferase (apo-ALT/apo-GPT) : ≤0.005
Impurities, total: ≤0.02
Lactate oxidase: ≤0.002
α-Ketoglutarate oxidase: ≤0.02
"NADH oxidase": ≤0.02
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
11 418 912 103	custom fill

Will be supplied as "Pyruvate Oxidase Recombinant (E. coli)". Unit of Measure is "kU".

DRY ICE

For further processing only.

Sarcosine Oxidase

from *E.coli* overproducer, lyophilizate

Cat. No.	Pack Size
11 378 856 103	custom fill

Will be supplied as "Sarcosine Oxidase, Recombinant (E. coli)".
Unit of Measure is "kU".

Oxidoreductase that catalyzes the demethylation of sarcosine to glycine.

Application

Use Sarcosine Oxidase in diagnostic tests for the determination of creatinine. This can be done using one of two methods:
(1) In combination with Creatinase, Catalog No. 11 799 142 103 and Creatininase, Catalog No. 11 865 471 103.
(2) In combination with Creatinine Deaminase, Catalog No. 11 330 764 103, N-Carbamoylsarcosine Amidase, Catalog No. 11 248 847 103 and N-Methylhydantoinase (ATP-hydrolysing), Catalog No. 11 288 555 103.

Benefits

Use Sarcosine Oxidase in your preferred creatinine reagent mix and rely on the proven diagnostic quality of this product.

EC 1.5.3.1

Properties

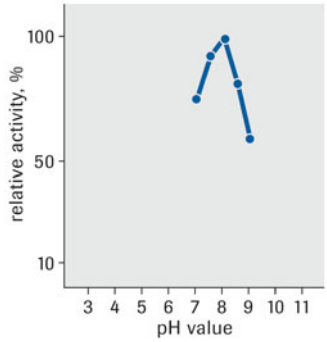
Nomenclature: Sarcosine:oxygen oxidoreductase (demethylating)
Molecular weight: 40 kD (PAGE, native Phast®-System)
Isoelectric point: 5.3 (Phast®-System)
Michaelis constants (Tris buffer, 0.1 mol/l, pH 8.0; Sarcosine):
at +25°C: 3.7 x 10^{-3} mol/l
at +37°C: 6.3 x 10^{-3} mol/l
Inhibitors: Completely inhibited by $ZnCl_2$ (7 mmol/l), $CdCl_2$ (7 mol/l), heavy metals and NaN_3. Chloroacetic amine (0.2%) does not inhibit.
pH optimum: 8.0 (see figure)
Temperature dependence: See figure
pH stability: 7.0-10.0 (see figure)
Thermal stability: Up to +50°C (see figure)
Specificity: Sarcosine Oxidase reacts with sarcosine (100%), N-ethylglycine, 2 mmol/l (4%), L(-)-proline (0.28%), carbamoylsarcosine (0%), and glycine (0%).

Specification

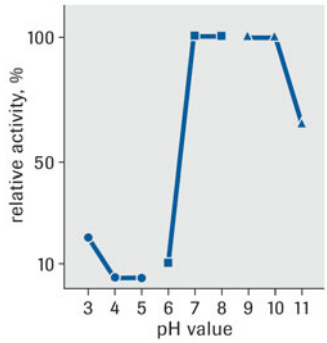
Appearance: Yellow lyophilizate
Solubility: Clear, yellow solution in water (c=10 mg/ml)
pH value (c=10 mg/ml in water): 7.5-8.5
Protein (Biuret): 0.4-0.6 mg/mg lyophilizate
Activity (+25°C, sarcosine): 22-40 U/mg lyophilizate
Specific activity: ≥45 U/mg protein
Contaminants (expressed as percentage of Sarcosine Oxidase activity):
ATPase: ≤0.01
Catalase: ≤10.0
Contaminating oxidases (FOX): ≤0.005
Creatinase: ≤0.001
Creatininase: ≤0.01
Creatinine deaminase: ≤0.001
N-Carbamoylsarcosine amidohydrolase: ≤0.001
N-Methylhydantoinase: ≤0.001
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Protect from light.

Literature

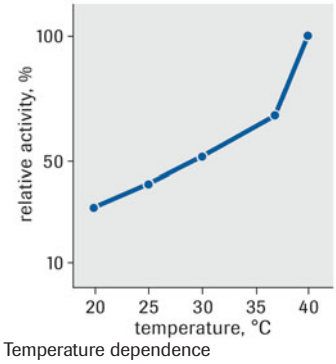
1) N. Mori, M. Sano, Y. Tani, H. Yamada, Agr. Biol. Chem. ***44*** (6), 1391 (1980)
2) M. Suzuki, J. Biochem. ***89***, 599 (1981)
3) S. Hayashi, M. Suzuki, S. Nakamura, Biochem. Int. ***4***, 617 (1982)
4) S. Hayashi, S. Nakamura, M. Suzuki, Biochem. Biophys. Res. Com. ***96***, 924 (1980)



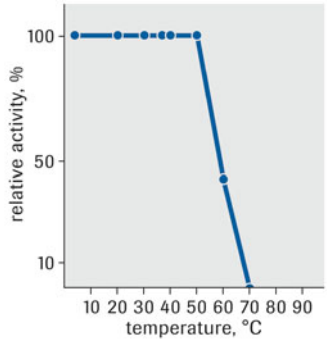
pH optimum



Incubation:
25°C, 360 min
● pH 3.0 – 5.0: citrate buffer, 50 mmol/l
■ pH 6.0 – 8.0: phosphate buffer, 50 mmol/l
▲ pH 9.0 –11.0: glycine buffer, 50 mmol/l
10 U sarcosine OD/ml
pH stability



Temperature dependence



Incubation:
10 min
phosphate buffer, 0.1 mol/l; pH 8.0
10 U sarcosine OD/ml
Thermal stability

For further processing only.

Triose-phosphate Isomerase
from rabbit muscle, suspension

Cat. No.	Pack Size
10 153 338 103	custom fill

Will be supplied as "Triosephosphate Isomerase, Rabbit Muscle". Unit of Measure is "MU".
For further processing only.

Isomerase that interconverts dihydroxyacetone phosphate and D-glyceraldehyde 3-phosphate.

Application
Use Triose-phosphate Isomerase in diagnostic reagents for the determination of aldolase in combination with Glycerol-3-phosphate Dehydrogenase, Catalog No. 10 151 351 103, and Fructose-1,6-diphosphate, Catalog. No. 10 041 793 103.

Benefits
Rely on the proven diagnostic quality of this product.

EC 5.3.1.1

Specification
Appearance: White suspension in ammonium sulfate
pH value: 5.5-6.5
Specific activity (+25°C, glyceraldehyde-3-phosphate): ≥5,000 U/mg protein
Protein (Biuret): 10±1 mg/ml
Contaminants (expressed as percentage of Triose-phosphate Isomerase activity):
Aldolase: ≤0.01
Glyceraldehyde-3-phosphate dehydrogenase: ≤0.001
Glycerol-phosphate dehydrogenase: ≤0.01
Stability: At +2 to +8°C within specification range for 24 months.

Thrombin
from human plasma, lyophilizate

Cat. No.	Pack Size
10 582 514 103	custom fill

Will be supplied as "Thrombin (Coagulation Factor II a)". Unit of Measure is "U".
For further processing only.

Plasma derived coagulation factor II a that selectively cleaves the Arg--Gly bonds of fibrinogen to form fibrin.

Application
Use Thrombin to generate reference antigens for anti D-dimer antibodies.

Benefits
Rely on the proven diagnostic quality of this product.

EC 3.4.21.5

Specification
Appearance: White lyophilizate
Specific activity (+25°C, Chromozym TH): ≥120 U/mg protein
Protein (Lowry): Approximately 0.004 mg/mg lyophilizate
Factor Xa: ≤3 %
Anti HIV: Negative
HBsAg: Negative
Stability: At +2 to +8°C within specification range for 24 months.

Urease
from jack bean, lyophilizate

Cat. No.	Pack Size
11 759 132 103	custom fill

Will be supplied as "Urease, Lyo., SQ". Unit of Measure is "MU".

Hydrolase that catalyzes the breakdown of urea in carbon dioxide and ammonia.

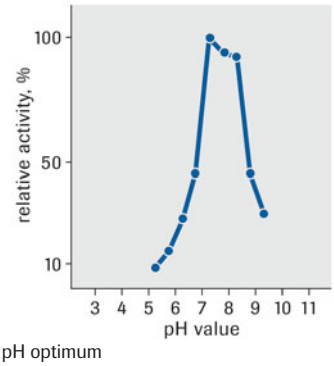
Application
Use Urease in diagnostic tests for the determination of urea in combination with Glutamate Dehydrogenase, Catalog Nos. 10 190 462 103 or 11 434 993 103.

Benefits
Rely on the proven diagnostic quality of this product.

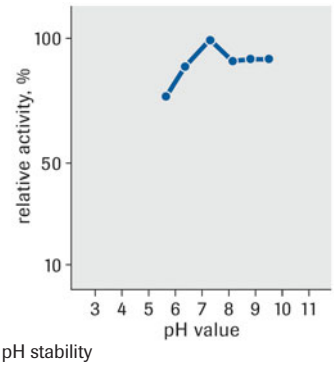
EC 3.5.1.5

Properties
Nomenclature: Urea amidohydrolase
Molecular weight: 480 kD
Isoelectric point: 5.0-5.1
Michaelis constant (Phosphate buffer, pH 7.0; +25°C):
Urea: 1.05 x 10^{-2} mol/l
Inhibitors: Na^+, K^+, NH_4^+; suramin and thiourea are competitive inhibitors.
Activators: P_i
pH optimum: 7.5 (see figure)
Temperature dependence: See figure
pH stability: 6.0-9.5 (see figure)
Thermal stability: Up to +70° C (see figure)
Specificity: Urease is specific for urea.

Specification
Appearance: Almost white lyophilizate
Solubility: Clear, colorless solution in water (c=20 mg/ml)
pH value (c=20 mg/ml in water): 6.0-7.0
Activity (+25° C, urea): ≥45 U/mg lyophilizate
Specific activity: ≥600 U/mg protein
Protein (Biuret): ≤0.15 mg/mg lyophilizate
Contaminants (expressed as percentage of Urease activity):
L-Arginase: ≤0.002
NH_4: ≤1.5 µg/KU
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

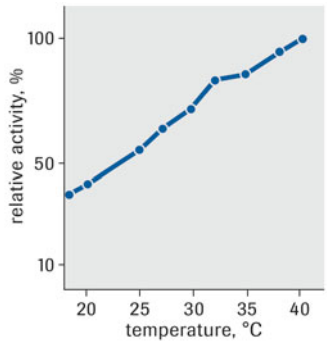


pH optimum

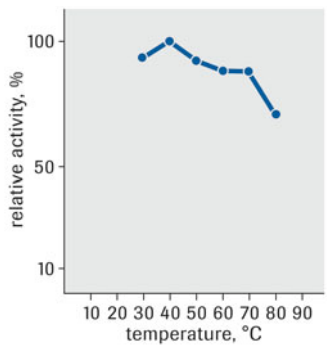


Incubation:
25°C, 24 h
K-phosphate buffer,
0.1 mol/l
urease,
approx. 45 U/ml

pH stability



Temperature dependence



Incubation:
15 min
K-phosphate buffer,
0.1 mol/l; pH 7.0
urease,
approx. 45 U/ml

Thermal stability

For further processing only.

Uricase

from *Arthrobacter protophormiae*, lyophilizate

Oxidase that catalyzes the oxidation of uric acid to 5-hydroxyisourate which decomposes to allantoin under *in vitro* conditions.

Application

Use Uricase in diagnostic tests for the determination of uric acid and for the elimination of uric acid interferences.

Benefits

- Eliminate uric acid interferences.
- Rely on the proven diagnostic quality.

EC 1.7.3.3

Properties

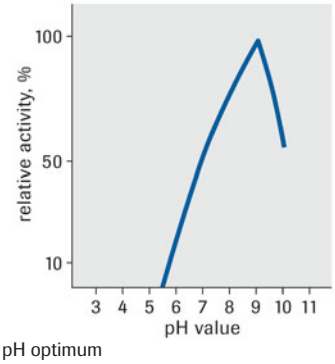
Nomenclature: Urate:oxygen oxidoreductase
Molecular weight: ~170 kD, with four subunits of ~40 kD
Michaelis constant (Phosphate buffer, 0.1 mol/l, pH 8.0; +25°C):
Urate: 6.6 x 10^{-5} mol/l
Stabilizer/activators: EDTA is good for stabilization. DTT or DTE may show a stabilizing effect depending on reagent composition. Triton X-100 (1-2 ml/l) may show an activating effect.
Inhibitors: Zn^{2+}, Cl^- (Tris-HCl buffer is not suitable) and borate inhibit strongly. NaN_3, 0.1% does not inhibit.
pH optimum: 9.0 (see figure). Roche uric acid reagent contains phosphate buffer, pH 7.8. For these conditions, high activity and higher stability of the Uricase are achieved.
Temperature dependence: See figure, above +50°C there is a decrease in activity due to lower O_2 concentration.
pH stability: 6.5-10.0 (see figure)
Thermal stability: +20°C to +60°C (see figure)
Specificity: Uricase is specific for urea.

Specification

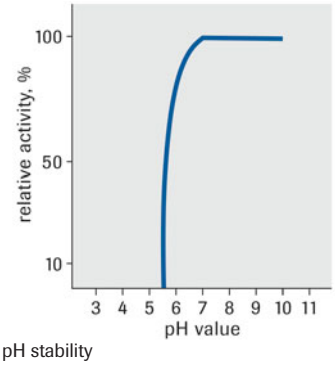
Appearance: White lyophilizate
pH value (c=10 mg/ml in water): 6.7-7.5
Protein (Biuret): No limit
Activity (+25°C, urate, saturated with O_2, pH 8.5): ≥20 U/mg lyophilizate
Specific activity: ≥50 U/mg protein
Contaminant (expressed as percentage of Uricase activity):
Catalase: ≤0.5
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 828 475 103	custom fill

Will be supplied as "Uricase from Arthrobact. protophormiae". Unit of Measure is "MU".

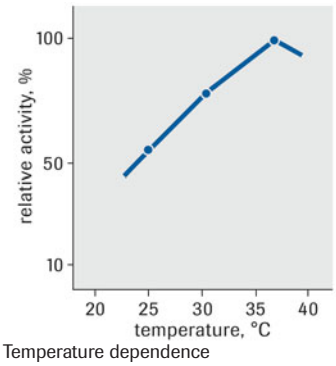


pH optimum

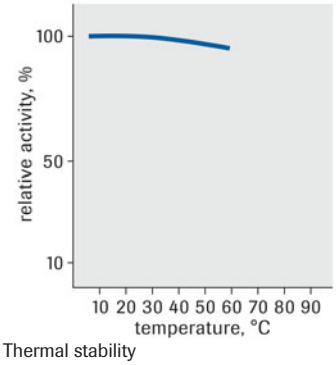


Incubation:
25°C, 24 h
pH 5.5 – 10.0:
potassium phosphate buffer, 0.1 mol/l
40 U uricase/ml

pH stability



Temperature dependence



Incubation:
15 min
phosphate buffer, 0.1 mol/l;
pH 8.0
40 U uricase/ml

Thermal stability

For further processing only.

3,5-Dichlorophenolsulfonic Acid
disodium salt

Cat. No.	Pack Size
10 667 536 103	custom fill

Will be supplied as "3,5-Dichlorophenol Sulfonic Acid, Di-Na". Unit of Measure is "g".
For further processing only.

Color reagent for diagnostic tests

Application
Use 3,5-Dichlorophenolsulfonic Acid instead of phenol as a component in the trinder reaction.

Benefits
- Take advantage of the higher molar absorptivity compared to phenol.

CAS: 95041-38-6

Properties
Nomenclature: 3.5-Dichloro-2-hydroxy-benzolsulphonic acid disodium salt
Formula: $C_6H_2O_4C_{12}SNa_2$
Molecular weight: 287.0 D

Specification
Appearance: White powder
Solubility: Clear, colorless solution in water (c=20 mg/ml)
Dichlorophenolsulphonic acid-Na (from C): ≥98.0%
C (elementary analysis): 24.6-25.6%
H (elementary analysis): 0.69-0.80%
Thin layer chromatography (TLC): Chromatographically homogeneous; corresponds to reference
Stability: At +15 to +25°C within specification range for 36 months.

4-Aminoantipyrine (4-APP)
crystalline powder

Cat. No.	Pack Size
10 073 474 001	custom fill

Will be supplied as "4-Aminoantipyrine". Unit of Measure is "kg".
For further processing only.

Substrate for peroxidase

Application
Use 4-Aminoantipyrine in a variety of diagnostic tests that use the Trinder reaction for the colorimetric determination of analytes, such as for the determination of cholesterol, glucose, creatinine or uric acid.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 83-07-8

Properties
Formula: $C_{11}H_{13}N_3O$
Molecular weight: 203.25 D

Specification
Appearance: Yellow to redish brown, crystalline powder
Solubility: Clear, colorless solution in water (c=0.1%, w/v)
Melting range: +106 to +109°C
A 370 (c=0.1%, w/v): ≤0.04
UV-spectrum (c=0.002%, w/v): Corresponds to reference
Maximum: 242-246 nm
Minimum: 217-219 nm
Shoulder: 274 nm
Heavy metals (as Pb): ≤5 ppm ≙ 0.0005%
IR-spectrum: Corresponds to reference
4-Aminoantipyrine ($HClO_4$-titration, based on undried substance): ≥98.0%

Purity (HPLC): ≥99.0 area%
Stability: At +15 to +40°C within specification range for 36 months. Store dry in tightly closed containers.

4-Nitrophenyl-α-D-maltohexaoside
powder

Cat. No.	Pack Size
10 691 682 103	custom fill

Will be supplied as "4-Nitrophenyl-a-D-malto- hexaoside". Unit of Measure is "g".
For further processing only.

Nitrophenyl substrate

Application
Use 4-Nitrophenyl-α-D-maltohexaoside in diagnostic tests for the determination of α-amylase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 74173-30-1

Properties
Formula: $C_{42}H_{65}NO_{33}$
Molecular weight: 1112.1 D

Specification
Appearance: White to slightly yellowish, amorphous powder
Solubility: Clear, slightly yellowish solution in water (c=70 mg/ml)
4-Nitrophenyl-maltohexaoside (enzymatically): ≥90%
4-Nitrophenyl-maltohexaoside (HPLC): ≥96.0 area%
Water (K. Fischer): ≤3.0%
4-Nitrophenyl-maltopentaoside (HPLC): ≤1.0 area%
4-Nitrophenyl-maltoheptaoside (HPLC): ≤2.0 area%
4-Nitrophenol, free: ≤0.05%
2-Propanol (GC): ≤6%
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

4-Nitrophenyl-α-D-maltopentaoside
powder

Cat. No.	Pack Size
10 691 747 103	custom fill

Will be supplied as "4-Nitrophenyl-a-D-malto- pentaoside". Unit of Measure is "g".
For further processing only.

Nitrophenyl substrate

Application
Use 4-Nitrophenyl-α-D-maltopentaoside in diagnostic tests for the determination of α-amylase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 66068-38-0

Properties
Formula: $C_{36}H_{55}NO_{28}$
Molecular weight: 949.9 D

Specification
Appearance: White or slightly yellowish, amorphous powder
Solubility: Clear, slightly yellowish solution in water (c=70 mg/ml)
4-Nitrophenyl-maltopentaoside (enzymatically): ≥90%
4-Nitrophenyl-maltopentaoside (HPLC): ≥98.0 area%
Water (K. Fischer): ≤2.0%
4-Nitrophenyl-maltotetraoside (HPLC): ≤0.4 area%

4-Nitrophenyl-maltohexaoside (HPLC): ≤0.6 area%
4-Nitrophenol, free: ≤0.05%
2-Propanol (GC): ≤6%
Stability: At +2 to +8°C within specification range for 18 months. Store dry.

4-Nitrophenyl Phosphate (4-NPP)
di-Tris salt

Cat. No.	Pack Size
10 270 857 103	custom fill

Will be supplied as "4-Nitrophenyl Phosphate, Di-Tris Salt". Unit of Measure is "kg".
For further processing only.

Substrate for alkaline phosphatase

Application
Use 4-Nitrophenyl Phosphate in diagnostic test for the determination of alkaline phosphatase according to the recommendations of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 68189-42-4

Properties
Formula: $C_6H_4NO_6P(C_4H_{12}NO_3)_2$
Molecular weight: 461.3 D (4-NPP: 219.1 D)

Specification
Appearance: White to slightly yellow, crystalline powder
Solubility: Clear, colorless to slightly yellow solution in water
4-NPP, di-Tris (from content found enzymatically): ≥88%
4-NPP (enzymatically): ≥42%
Tris (titrimetric): ≥46%
Water (K. Fischer): ≤6%
4-NP free: ≤0.07%
Reaction rates (alkaline phosphatase): 100±5%
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Protect from light.

ABTS
2,2'-Azino-di-[3-ethylbenzthiazoline sulfonate (6)] diammonium salt

Cat. No.	Pack Size
10 122 661 103	custom fill

Will be supplied as "ABTS, Diammonium Salt". Unit of Measure is "kg".
For further processing only.

Substrate for peroxidase

Application
Use ABTS for activity measurements of peroxidase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 30931-67-0

Properties
Formula: $C_{18}H_{16}N_4O_6S_4(NH_4)_2$
Molecular weight: 548.5 D (ABTS: 514.6 D)
POD changes absorbance with ABTS from colorless to green at 405 nm.

Specification
Appearance: Green crystals
Solubility: Clear, slightly green solution in water (c=20 mg/ml)
ABTS-$(NH_4)_2$ (A_{340}, ε=40.28 [l x $mmol^{-1}$ x cm^{-1}]): ≥97.5%

Thin layer chromatography: Chromatographically homogeneous
Stability: At +2 to +8°C within specification range for 24 months. Keep under nitrogen or argon. Protect from light.

Benzylidene-4-NP-G7

4,6-Benzylidene-4-nitrophenyl-α-D-maltoheptaoside, lyophilizate

Cat. No.	Pack Size
11 378 872 103	custom fill

Will be supplied as "Benzylidene-4-NP-G7". Unit of Measure is "kg".

DRY ICE

For further processing only.

Nitrophenyl substrate

Application
Use Benzylidene-4-NP-G7 in diagniostic tests for the determination of α-amylase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 109055-07-4

Properties
Formula: $C_{55}H_{79}NO_{38}$
Molecular weight: 1362.1 D

Specification
Appearance: White to slightly yellowish lyophilizate
Benzylidene-4-NP-G7 (enzymatically): ≥90%
Water (K. Fischer): ≤3%
4-NP-maltoheptaoside (HPLC): ≤1.0 area%
4-Nitrophenol, free: ≤0.01%
Reaction rates (α-amylase):
In Precinorm (R) U: 100±5%
In Precipath (R) U: 100±5%
Stability: At -15 to -25°C within specification range for 18 months. Store dry.

Chromogenic Substrate for Lipase

Cat. No.	Pack Size
11 034 618 103	custom fill

Will be supplied as "Chromogenic Substrate for Lipase". Unit of Measure is "g".
For further processing only.

Substrate for lipase

Application
Use Chromogenic Substrate for Lipase in diagnostic tests for the determination of lipase activity.

Benefits
- Design the best possible diagnostic test for lipase activity.
- Rely on the proven diagnostic quality of this product.

CAS: 195833-46-6

Properties
Nomenclature: 1,2-O-Dilauryl-rac-glycero-3-glutaric acid-(6'-methylresorufin)ester
Formula: $C_{45}H_{69}NO_{8}$
Molecular weight: 752.05 D
$\lambda_{max.substrate}$: 470 nm (Tris-HCl, pH 8.4)
ε_{470}: 57.94 [l x mmol^{-1} x cm^{-1}]
$\lambda_{max.methylresorufin}$: 581 nm (Tris-HCl, pH 8.4)
Melting range: +29 to +31°C
pH optimum: 7.0-9.5

Solubility: Soluble in polar organic solvents, *e.g.,* n-propanol, ethyl acetate, dioxane,
methanol, dimethyl sulfoxide. The limit of solubility in n-propanol is 42.9 mg/ml.

Specification

Appearance: Red, smear substance
Chromogenic Lipase Substrate (from C): ≥95%
Chromogenic Lipase Substrate (HPLC): ≥95 area%
C (elementary analysis): 68.2-72.5%
H (elementary analysis): 8.7-9.7%
N (elementary analysis): 1.4-2.4%
Methylresorufin, free (HPLC): ≤0.5 area%
Isomer (HPLC): ≤2 area%
Stability: At +2 to +8°C within specification range for 36 months.

Background Information

Reagent proposal for lipase test
The sensitivity of this lipase test is especially influenced by the extinction of the substrate solution, the concentration of taurodesoxycholate, the pH value, and the molarity of the Tris buffer.

Final test concentration of the substrate solution:
chrom. Lipase Substrate: 0.24 mmol/l (=180 mg/l)
colipase: 0.98 mg/l
taurodesoxycholate *(see buffer solution)
$CaCl_2$:0.1 mol/l
tartrate buffer, pH 4.0: 1.6 mmol/l
stabilizers
The lipase substrate has to be dissolved in a small quantity of an organic solvent (*e.g.* n-propanol) first. Under vigorous stirring this organic solution should be injected into the tartare buffered aqueous solution with a thin beam. (The lipase substrate starts to hydrolyze at alkaline pH values.) The lipase substrate containing solution should be a micro-emulsion with
an extinction of about 0.5 E. (Lower extinction of the reagent results in measurement of nonspecific serum esterases.) Stabilizers like mannitol, polywax 4000 and co-emulsifiers like lecithin, phosphoryl choline or dilauryl-glycerol-sulfate improve the stability of the micro-emulsion.

Final test concentration of the buffer solution:
Tris-HCl, pH 8.4: 41 mmol/l
taurodesoxycholate: *7.2 mmol/l (total)
desoxycholate: 1.77 mmol/l
Wavelength: 578 nm or 580 nm
Temperature: +25°C, +30°C or +37°C, respective
Buffer solution: 1 ml
Substrate solution: 0.2 ml
Sample volume: 0.02 ml
Assay time: 2 to 10 minutes
Start of reaction: with substrate

Literature

1) Neumann U, Junius M, Maier B. A sensitive colorimetric assay for the kinetic Lipase determination in serum (Boehringer Mannheim/now Roche Diagnostics). Abstract 13th Int. Congress for Clin Chem (ICCC), Den Haag, Netherlands, 28.6-3.7; 1987
2) Panteghini M, Bonora R, Pagani F. Measurement of pancreatic lipase activity in serum by a kinetic colorimetric assay using a new chromogenic substrate, Ann. Clin. Biochem. (2001) Jul ;***38*** (Pt 4), 365-70.

Ethylidene-4-NP-G7

Ethyliden-4-nitrophenyl-α-D-maltoheptaosid (EPS), powder

Nitrophenyl substrate

Application

Use Ethylidene-4-NP-G7 in diagniostics tests for the determination of α-amylase and pancreatic α-amylase according to the recommendations of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

Benefits

- Minimize the value of your blank for the liquid α-amylase reagent.
- Rely on the proven purity and the very low content of free maltoheptaoside.

CAS: 96597-16-9

Properties

Formula: $C_{50}H_{77}NO_{38}$
Molecular weight: 1300.1 D

Specification

Appearance: White to slightly yellowish, amorphous powder
Solubility: Clear, slightly yellowish solution in water (c=70 mg/ml)
EPS (enzymatically): ≥90%
Water (K. Fischer): ≤3%
pNP-G7 (enzymatically): ≤0.1%
pNP, free: ≤0.01%
Reaction rates (α-amylase):
In Precinorm U: 95-105%
In Precipath U: 95-105%
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Literature

E. Rauscher *et al*., Fresenius Z. Analyt. Chem. ***324***, 304 (1986)

Cat. No.	Pack Size
10 880 078 103	custom fill

Will be supplied as "Ethylidene-4-NP-G7". Unit of Measure is "kg". Additional products: OEM reagents for the determination of α-amylase and pancreatic amylase, as well as specific inhibitory antibodies. Catalog Nos. 11 543 598 103 and 11 543 601 103 for the detection of pancreatic amylase.

For further processing only.

Glupa-carboxylate

monoammonium salt

Substrate for γ-glutamyltransferase

Application

Use Glupa-carboxylate in diagnostic tests for the determination of γ-glutamyltransferase, according to the recommendations of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

Benefits

Rely on the proven diagnostic quality of this product.

CAS: 63699-78-5

Properties

Formula: $C_{12}H_{12}N_3O_7NH_4$
Molecular weight: 328.3 D

Specification

Appearance: White to yellowish crystalline powder
Solubility: Clear, yellow solution in water (c=100 mg/ml), tested for insolubles
pH value: 4.0-6.0
Molar rotation: [α] 25/D +32.0±2.0°

Cat. No.	Pack Size
10 413 151 103	custom fill

Will be supplied as "Glupa-carboxylate, Monoammonium Salt". Unit of Measure is "kg".
For further processing only.

Melting range (Kofler): Approximately +170 to +180°C
Glupa-carboxylate, free acid (enzymatically): ≥87%
Glupa-carboxylate (HPLC): ≥99 area%
Water (K. Fischer): ≤6.2%
NH_4 (Neßler's reagent): 5.2±1%
5-Amino-2-nitrobenzoate (HPLC): ≤0.1 area%
α-Glupa-carboxylate (HPLC): ≤0.4 area%
Thin layer chromatography (silica gel F; n-butanol/glacial acetic acid/H_2O = 50/15/25; UV, with Nihydrin): Chromatographically homogeneous
A_{405} (Glupa-carboxylate, 6 mmol/l): 0.65-0.80
Stability: At +2 to +8°C within specification range for 24 months. Protect from light.
Additional formulations (tablets) are available on request.

Literature

Schumann G, Bonora R, Ceriotti F, Férard G, Ferrero CA, et al. IFCC primary reference procedures for the measurement of catalytic activity concentrations of enzymes at 37 degrees C. International Federation of Clinical Chemistry and Laboratory Medicine. Part 6. Reference procedure for the measurement of catalytic concentration of gamma-glutamyltransferase. Clin Chem Lab Med. 2002 Jul, ***40*** (7): 734-8.

TOOS

(N-Ethyl-N-(2-hydroxy-3-sulfopropyl)-m-toluidine, monosodium salt, dihydrate

Substrate for peroxidase

Cat. No.	Pack Size
11 650 670 103	custom fill

Will be supplied as "TOOS". Unit of Measure is "kg".
For further processing only.

Application

Use TOOS together with 4-Aminoantipyrine in an indicator reaction using peroxidase to form a quinoneimine dye.

Benefits

Rely on the proven diagnostic quality of this product.

CAS: 679787-10-1

Properties

Nomenclature: Dihydrate (N-Ethyl-N-(2-hydroxy-3-sulfopropyl)-m-toluidine
Formula: $C_{12}H_{18}NO_4SNa \times 2\ H_2O$
Molecular weight: 331.37 D

Specification

Appearance: White to slightly bluish crystallizate
TOOS, mono-Na x 2 H_2O (from C): ≥98.0%
C (elementary analysis): 42.6-46.5%
H (elementary analysis): 6.3-6.8%
N (elementary analysis): 3.8-4.7%
Water (K. Fischer): 7.0-12.0%
Heavy metals (as Pb): ≤20 ppm
Stability: At +15 to +25°C within specification range for 24 months.

Tribromo-hydroxybenzoic acid
crystallizate

Color reagent for diagnostic tests

Application
Use Tribromo-hydroxybenzoic acid instead of phenol as a component in the trinder reaction.

Benefits
- Take advantage of the higher molar absorptivity compared to phenol.

CAS: 14348-40-4

Properties
Formula: $C_7H_3O_3Br_3$
Molecular weight: 374.8 D

Specification
Appearance: White crystallizate
Solubility: Clear, colorless solution in NaOH, 0.1 mol/l (c=2.09%, w/v)
Dissolving time (c=2.09%, w/v): 10-20 minutes in NaOH, 0.1 mol/l
A_{405} (c=2.09%, w/v, in NaOH, 0.1 mol/l): ≤0.020
Melting range: +143 to +148°C
Thin-layer chromatography (TLC): Corresponds to reference
2,4,6-Tribomo-hydroxybenzoic acid (alkalimetrically): ≥98.0%
Stability: At +15 to +40°C within specification range for 24 months. Store dry in tightly sealed containers. Protect from light.

Cat. No.	Pack Size
10 755 745 103	custom fill

Will be supplied as "Tribrom-Hydroxybenzoic acid". Unit of Measure is "g".
For further processing only.

L(+)-Alanine
crystalline powder

Cat. No.	Pack Size
10 136 921 103	custom fill

Will be supplied as "L(+)-Alanin". Unit of Measure is "kg".
For further processing only.

Substrate for alanine aminotransferase

Application
Use L(+)-Alanine in diagnostic tests for the determination of alanine aminotransferase (ALT).

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 56-41-7

Properties
Formula: $C_3H_7NO_2$
Molecular weight: 89.09 D
Solubility: Easily soluble in water and mineral acids, insoluble in organic solvents.

Specification
Appearance: White, crystalline powder or crystals
Solubility: Clear, colorless solution in phosphate buffer (c=0.9%, w/v, pH 7.4)
Microbiological test: Corresponds
Heavy metals (as Pb): ≤20 ppm ≙ 0.002%
Sulfate ash: <00.1%
Thin layer chromatography: Corresponds to reference
Water (K.Fischer): ≤1.0%
L-alanine ($HClO_4$ titration, based on anhydrous substance): 98.5-100.5%
L-alanine (enzymatically, based on anhydrous substance): 97.0-105.0%
Stability: At +15 to +40°C within specification range for 36 months. Store dry in tightly closed containers.

α-Ketoglutarate (2-Oxoglutarate)
free acid

Cat. No.	Pack Size
10 156 736 103	custom fill

Will be supplied as "a-Ketoglutaric Acid, Free Acid". Unit of Measure is "kg".
For further processing only.

Substrate for transaminases and glutamate dehydrogenase

Application
Use α-Ketoglutarate in a variety of diagnostic tests, such as for the determination of alanine aminotransferase, aspartate aminotransferase, ammonia, urea and glutamate dehydrogenase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 328-50-7

Properties
Formula: $C_5H_6O_5$
Molecular weight: 146.1 D

Specification
Appearance: White crystallizate
Solubility: Clear, colorless solution in water (c=50 mg/ml)
A_{405} (c=50 mg/ml in water, against water): ≤0.020
Melting range: +113 to +117°C
α-Ketoglutaric acid (enzymatically): ≥98%
Water (K. Fischer): ≤1%
NH_4 (enzymatically): ≤0.1%

Heavy metals (as Pb): ≤10 ppm
Bioburden: ≤100 CFU/g
Reaction rates (Glutamate pyruvate transaminase (ALT)): ≥95%
Reaction rates (Glutamate oxalacetate transaminase(AST)): ≥95%
Stability: At +15 to +25°C within specification range for 36 months.

α-Ketoglutarate (2-Oxoglutarate)
disodium salt, dihydrate

Cat. No.	Pack Size
10 040 584 103	custom fill

Will be supplied as "a-Ketoglutarate (a-Oxoglutarate), Di-Na". Unit of Measure is "kg".
Additional formulation: Crystallized free acid, Catalog No. 10 156 736
For further processing only.

Substrate in enzymatic reactions with glutamate dehydrogenase or transaminases

Application
Use α-Ketoglutarate in a variety of diagnostic tests, such as for the determination of glutamate dehydrogenase, ammonia, alanine- and aspartate aminotransferases and urea. The dihydrate formulation is well suited for dry chemistry tests.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 305-72-6

Properties
Formula: $C_5H_8O_7Na_2$
Molecular weight: 226.1 D (α-KG: 146.1 D)

Specification
Appearance: White, crystalline powder
Solubility: Clear, colorless solution in water, pH 7.3 (c=200 mg/ml)
A_{405} (c=10 mg/ml, water; against water): ≤0.020
α-Ketoglutarate, salt (based on value found enzymatically): ≥97%
α-Ketoglutarate, free acid (enzymatically): ≥63%
Na (flame photometric): 20.5±1%
Water (K. Fischer): 15±2%
Stability: At +15 to +25°C within specification range for 24 months. Store dry.

α-Ketoglutarate (2-Oxoglutarate)
disodium salt

Cat. No.	Pack Size
10 266 400 103	custom fill

Will be supplied as "a-Ketoglutarate, Di-Na, (M 190.1 g/mol)". Unit of Measure is "kg".
For further processing only.

Substrate in enzymatic reactions with glutamate dehydrogenase or transaminases

Application
Use α-Ketoglutarate in a variety of diagnostic tests, such as for the determination of glutamate dehydrogenase, ammonia, alanine- and aspartate aminotransferases and urea. The dissodium formulation is well suited for liquid tests.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 305-72-6

Properties
Formula: $C_5H_4O_5Na_2$
Molecular weight: 190.1 D (α-KG: 146.1 D)

Specification

Appearance: White, crystalline powder
Solubility: Clear, colorless solution in water, pH 7.3 (c=200 mg/ml)
A_{405} (c=10 mg/ml in water, against water): ≤0.020
α-Ketoglutarate, salt (based on value found enzymatically): ≥97.5%
α-Ketoglutarate, free acid (enzymatically): ≥74%
Na (flame photometric): 24±2%
Water (K. Fischer): ≤2%
Heavy metals (as Pb): ≤0.002%
Stability: At +15 to +25°C within specification range for 24 months. Store dry.
Additional formulation crystallized free acid, Catalog No. 10 156 736

α-Ketoglutarate (2-Oxoglutarate) for potassium test

free acid

Substrate for transaminases and glutamate dehydrogenase

Cat. No.	Pack Size
11 332 775 103	custom fill

Will be supplied as "a-Ketoglutaric Acid for Potassium Test". Unit of Measure is "kg".
For further processing only.

Application

Use α-Ketoglutarate for enzymatic potassium tests especially to remove ammonia from the reaction.

Benefits

- Rely on the proven diagnostic quality of this product.
- Rely on the strongly reduced concentration of potassium.

CAS: 328-50-7

Properties

Formula: $C_5H_6O_5$
Molecular weight: 146.1 D

Specification

Appearance: White crystallizate
Solubility: Clear, colorless solution in water (c=50 mg/ml)
A_{405} (c=50 mg/ml in water, against water): ≤0.020
Melting range: +113 to +117°C
α-Ketoglutaric acid (enzymatically): ≥98%
Water (K. Fischer): ≤1%
NH_4 (enzymatically): ≤0.1%
Na (AES): ≤500 ppm
K (AES): ≤10 ppm
Heavy metals (as Pb): ≤10 ppm
Bioburden: ≤100 CFU/g
Reaction rates (Glutamate pyruvate transaminase (ALT)): ≥95%
Reaction rates (Glutamate oxalacetate transaminase (AST)): ≥95%
Stability: At +15 to +25°C within specification range for 36 months.

Creatine Phosphate
disodium salt

Substrate for creatine kinase (reverse reaction)

Application
Use Creatine Phosphate in diagnostic tests for the determination of creatine kinase, according to the recommendations of the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 922-32-7

Properties
Molecular weight: 327.2 D (CP: 211.1 D)

Specification
Appearance: White crystals
Solubility: Clear, colorless solution in water (c=150 mg/ml), free from fuzz
pH value (c=10 mg/ml in water): 7.7-8.7
Creatine-P-Na_2 x 4 H_2O (based on value found enzymatically): ≥97%
Creatine-P (enzymatically): ≥63%
Creatine-P (from $P_{organic}$): ≥63%
Na (flame photometric): 14±1%
Water (K. Fischer): 22±2%
$P_{organic}$ (P_{total} - P_i): ≥9.25%
P_{total}: ≥9.25%
P_i (acid labile): ≤0.5%
P_i (Fiske and Subbarow): ≤1.5%
PP_i (enzymatically): ≤0.02%
ATP (enzymatically with hexokinase/G6P-DH): ≤0.002%
Sulfate (qualitative): Negative
Creatine, free: ≤0.5%
Glucose-6-P (enzymatically): ≤0.006%
PEP (enzymatically): ≤0.05%
Pyruvate (enzymatically): ≤0.02%
Kinetic of creatine kinase reaction: Corresponds to standard
Reaction rates (creatine kinase): 95-105%
A_{334} (c=9 ml/ml water): ≤0.005
A_{334} (against reaction mixture CK NAC active): ≤0.040
A_{340} (hydrous solution): ≤0.120
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 003 506 103	custom fill

Will be supplied as "Creatine Phosphate, Disodium Salt". Unit of Measure is "kg".
For further processing only.

D(-)-Lactate
monolithium salt

Cat. No.	Pack Size
10 151 874 103	custom fill

Will be supplied as "D(-)-Lactate, Monolithium Salt". Unit of Measure is "g".
For further processing only.

Substrate for D-lactate dehydrogenase

Application
Use D(-)-Lactate as a standard in tests for lactic acid.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 27848-80-2

Properties
Formula: $C_3H_5O_3Li$
Molecular weight: 96.0 D (Lactate: 89.1 D, Lactic acid: 90.1 D)

Specification
Appearance: White, crystalline powder
D(-)-Lactate (enzymatically, as anion): ≥91%
Li (flame photometric): 7.0±1.0%
L(+)-Lactate (enzymatically, as anion): ≤0.2%
Stability: At +15 to +25°C within specification range for 36 months.

Di(adenosine-5'-)penta-phosphate
trilithium salt

Cat. No.	Pack Size
10 161 624 103	custom fill

Will be supplied as "Di(adenosine-5'-)penta-phosphate, Tri-Li". Unit of Measure is "g".
For further processing only.

Inhibitor of adenylate kinase

Application
Use Di(adenosine-5'-)penta-phosphate in diagnostic reagents for the determination of creatine kinase to inhibit adenylate kinase in the reaction.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 75522-97-3

Properties
Formula: $C_{20}H_{26}N_{10}O_{22}P_5Li_3$
Molecular weight: 934.2 D (Ap5A: 916.4 D)

Specification
Appearance: White to slightly yellowish, amorphous powder
Solubility: Clear, colorless to slightly yellowish solution in water (c=10 mg/ml)
Ap5A-Li$_3$ (from $P_{organic}$): ≥91%
Ap5A (A_{260}, ε=26.4 [l x mmol^{-1} x cm^{-1}]): ≥90%
Ap5A (from $P_{organic}$): ≥90%
Ap5A (HPLC): ≥95 area%
Li (flame photometric): 2.1±0.3%
Water (K. Fischer): ≤5%
P_{total} (ammonium vanadate): ≥15.2%
P_i (ammonium vanadate): ≤1.5%
Thin layer chromatography (PEI-cellulose, KH_2PO_4, 0.75 mol/l): Chromatographically homogeneous
A_{250}/A_{260}: 0.79±0.04
A_{280}/A_{260}: 0.21±0.03
A_{290}/A_{260}: 0.02±0.02
Stability: At +2 to +8°C within specification range for 24 months.

Fructose-1,6-diphosphate
trisodium salt

Cat. No.	Pack Size
10 041 793 103	custom fill

Will be supplied as "Fructose-1,6-diphosphate, Trisodium Salt".
Unit of Measure is "kg".
For further processing only.

Substrate for aldolase and phosphatases

Application
Use Fructose-1,6-diphosphate for the determination of aldolase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 23558-08-9

Properties
Formula: $C_6H_{11}O_{12}P_2Na_3$ x 8 H_2O
Molecular weight: 550.2 D (Fructose-1,6-P_2: 340.1 D)

Specification
Appearance: White to slightly yellowish crystallizate
Solubility: Clear, colorless to slightly yellow solution in water (c=50 mg/ml)
Fructose-1,6-P_2-Na_3 x 8 H_2O (from content enzymatically): ≥97%
Fructose-1,6-P_2 (enzymatically): ≥60%
Na (flame photometric): 11-15%
Water (K. Fischer): 23-29%
P_i: ≤0.6%
Heavy metals (as Pb): ≤10 ppm
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Glucose-1,6-diphosphate
tetra(cyclohexylammonium) salt

Cat. No.	Pack Size
10 150 827 103	custom fill

Will be supplied as "Glucose-1,6-diphosphate, Tetra-CHA Salt".
Unit of Measure is "g".
For further processing only.

Substrate in diagnostic tests

Application
Use Glucose-1,6-diphosphate in diagnostic tests for the determination of inorganic phosphate and sucrose.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 10139-18-1

Properties
Formula: $C_6H_{14}O_{12}P_2$ x $(C_6H_{14}N)_4$ x 4 H_2O
Molecular weight: 808.9 D (Glucose-1,6-P_2: 340.1 D)

Specification
Appearance: Yellowish crystallizate
Glucose-1,6-P_2(CHA)$_4$ x 4 H_2O: 93.0-105.0%
Glucose-1,6-P_2 (from $P_{organic}$): 39.0-44.0%
CHA (titrimetric): 46.-50.0%
Water (K. Fischer): 6.0-10.0%
$P_{organic}$ (P_{total} - P_i): 7.10-8.00%
P_i: ≤0.30%
Stability: At +15 to +25°C within specification range for 36 months

Glucose-6-phosphate
disodium salt

Cat. No.	Pack Size
10 153 079 103	custom fill

Will be supplied as "Glucose-6-phosphate, Disodium Salt". Unit of Measure is "g".
For further processing only.

Substrate for glucose-6-phosphate dehydrogenase

Application
Use Glucose-6-phosphate in diagnostic tests for the determination of glucose-6-phosphate dehydrogenase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 3671-99-6

Properties
Formula: $C_6H_{11}O_9PNa_2$
Molecular weight: 304.2 D (Glucose-6-P: 260.2 D)

Specification
Appearance: White lyophilizate
Solubility: Clear solution in water (c=50 mg/ml)
Glucose-6-P (enzymatically): ≥77%
Glucose-6-P (from $P_{organic}$): ≥77%
Na (flame photometric): 12.5±1%
Water (K. Fischer): 8±2%
$P_{organic}$ (P_{total} - P_i – $P_{fructose-6-P}$): ≥8.9%
P_i: ≤0.6%
Fructose-6-P (enzymatically): ≤2%
Glucose (enzymatically): ≤0.2%
Stability: At +15 to +25°C within specification range for 24 months. Store dry.

N-Acetyl-L-Cysteine
crystallizate

Cat. No.	Pack Size
10 068 365 103	custom fill

Will be supplied as "N-Acetyl-L-Cystein". Unit of Measure is "kg".
For further processing only.

Activator of creatine kinase

Application
Use N-Acetyl-L-Cysteine in diagnostic tests for the determination of creatine kinase, where it is used to reactivate creatine kinase as recommended by the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 616-91-1

Properties
Formula: $C_5H_9NO_3S$
Molecular weight: 163.19 D

Specification
Appearance: White crystals
Solubility: Clear, colorless solution in water (c=5%, w/v)
Melting range: +107 to +113°C
Specific rotation (c=2%, w/v, based on undried substance): [α] 25/D: +3.0° to +5.0°
Heavy metals (as Pb): ≤5 ppm ≙ 0.0005%
Screening analysis:
Particle size ≥250 µm: ≤15%
Particle size ≥100 µm: ≤50%

Fe (AAS): ≤2.0 ppm ≙ 0.0002%
Cu (AAS): ≤1.0 ppm ≙ 0,0001%
Mn (AAS): ≤1.0 ppm ≙ 0,0001%
Microbiological test: Corresponds to specification
IR-spectrum: Corresponds to reference
Purity (HPLC): ≥99.0 area%
N-Acetyl-L-Cysteine (Ellmann's reagent, based on undried substance): ≥99.0%
N-Acetyl-L-Cysteine (alkalimetric, based on undried substance): ≥99.0%
Content of nitrogen (elementary analysis, based on undried substance): ≥8.5%
Content from nitrogen (elementary analysis, based on undried substance): ≥99.0%
Stability: At +15 to +40°C within specification range for 24 months. Store dry in tightly closed containers.

Phosphoenolpyruvate (PEP), for potassium test

tri(cyclohexylammonium) salt

Cat. No.	Pack Size
11 333 968 103	custom fill

Will be supplied as "PEP, tri-CHA for Potassium Test". Unit of Measure is "kg".
Additional formulation: Crystallized monosodium salt, Catalog No. 10 152 960 103
For further processing only.

Substrate for phosphoenolpyruvate carboxylase

Application

Use Phosphoenolpyruvate as a substrate for pyruvate kinase, stimulated by potassium, for the enyzymatic determination of potassium.

Benefits

- Rely on the proven diagnostic quality of this product.
- Take advantage of the strongly reduced concentration of potassium.

CAS: 138-08-9

Properties

Formula: $C_3H_2O_6P\ (C_6H_{14}N)_3 \times H_2O$
Molecular weight: 483.3 D (PEP: 168.0 D)

Specification

Appearance: Colorless crystallizate
PEP-(CHA)$_3$ (from content found enzymatically): ≥96%
PEP (enzymatically): ≥34.5%
CHA (titrimetric): 57-67%
Water (K. Fischer): ≤4.5%
P_i: ≤0.6%
Pyruvate (enzymatically): ≤0.1%
Na (AES) : ≤100 ppm
K: ≤10 ppm
Stability: At +2 to +8°C within specification range for 24 months.

Phosphoenolpyruvate (PEP)

tri(cyclohexylammonium) salt

Cat. No.	Pack Size
10 005 185 103	custom fill

Will be supplied as "Phosphoenolpyruvate (PEP), CHA-Salt". Unit of Measure is "kg".
For further processing only.

Substrate for phosphoenolpyruvate carboxylase

Application

Use Phosphoenolpyruvate in diagnostic tests for the determination of carbon dioxide, creatine or pyruvate kinase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 138-08-9

Properties
Formula: $C_3H_2O_6P$ $(C_6H_{14}N)_3$ x H_2O
Molecular weight: 483.3 D (PEP: 168.0 D)

Specification
Appearance: Colorless, crystalline powder
PEP salt (based on value found enzymatically): ≥96%
PEP (enzymatically): ≥34.5%
CHA (titrimetric with perchloric acid): 57-67%
Water (K. Fischer): ≤4.5%
P_i (Fiske and Subbarow): ≤0.6%
Pyruvate (enzymatically): ≤0.1%
Stability: At +2 to +8°C within specification range for 24 months.
Additional formulation crystallized monosodium salt, Catalog No. 10 152 960

Phosphoenolpyruvate (PEP)
monosodium salt

Substrate for phosphoenolpyruvate carboxylase

Application
Use Phosphoenolpyruvate in diagnostic tests for the determination of carbon dioxide, creatine or pyruvate kinase.

Cat. No.	Pack Size
10 152 960 103	custom fill

Will be supplied as "Phosphoenolpyruvate (PEP), Mono-Na Salt". Unit of Measure is "g".
For further processing only.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 138-08-9

Properties
Formula: $C_3H_4O_6PNa$ x H_2O
Molecular weight: 208.0 D (PEP: 168.0 D)

Specification
Appearance: White, crystalline powder
PEP-Na x H_2O (based on value found enzymatically): ≥94%
PEP (enzymatically): ≥76.0%
Na (flame photometric): 9-13%
Water (K. Fischer): 8-10%
P_i: ≤0.6%
Pyruvate (enzymatically): ≤0.1%
Stability: At +2 to +8°C within specification range for 24 months.

Pyruvate
monosodium salt

Substrate for many enzymes, such as lactate dehydrogenase and pyruvate kinase.

Application
Use Pyruvate in diagnostic tests for the determination of lactate dehydrogenase.

Cat. No.	Pack Size
10 005 525 103	custom fill

Will be supplied as "Pyruvate Monosodium Salt". Unit of Measure is "g".
For further processing only.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 57-60-3

Properties
Formula: $C_3H_3O_3Na$
Molecular weight: 110.0 D

Specification
Appearance: White, crystalline powder
Pyruvate-Na (from content found enzymatically): 96-103%
Pyruvate (enzymatically, based on anion): 77-81%
Na (flame photometric): 20.5-21.5%
Bioburden: ≤100 CFU/g
Heavy metals (as Pb): ≤10 ppm
Stability: At +15 to +25°C within specification range for 18 months.

S-Butyrylthiocholine Iodide
crystallizate

Cat. No.	Pack Size
10 034 614 103	custom fill

Will be supplied as "S-Butyrylthiocholine Iodide". Unit of Measure is "kg".
For further processing only.

Substrate for cholinesterase

Application
Use S-Butyrylthiocholine Iodide in diagnostic tests for the determination of cholinesterase.

Benefits
Rely on the proven diagnostic quality of this product.

CAS: 1866-16-6

Properties
Formula: $C_9H_{20}NOSJ$
Molecular weight: 317.2 D

Specification
Appearance: Colorless crystallizate
Solubility: Clear, colorless solution in water (c=70 mg/ml)
Melting range: +172 to +174°C
Butyrylthiocholine iodide (titrimetric) : ≥98.0%
Thiocholine iodide, free: ≤0.15%
Test for inhibitors of choline esterase; reaction rates: 100±5%
Stability: At +2 to +8°C within specification range for 24 months.


BIOPROZESSANL. 1
WAGNER TOBIAS
Roche

2 Immunology

MAB<CK-MB>M-7.4.5 IgG
lyophilizate

Cat. No.	Pack Size
11 719 815 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<CK-MB>M-7.4.5 IGG". Unit of Measure is "mg".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<CK-MB>M-7.4.5 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<CK-MB>M-6.12.47 IgG.

Product Description
Antibody class: IgG 1, kappa

Properties
MAB<CK-MB>M-7.4.5 IgG is a monoclonal antibody directed to creatine kinase MB. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<CK-MM>Mix
frozen solution

Cat. No.	Pack Size
04 688 457 103	1, 10, 50, 100, 1000 ml

Will be supplied as "Mab<CK-MM>Mix". Unit of Measure is "l".
DRY ICE
For further processing only.

For measurement of human creatine kinase isoenzyme (CK-MB), which is a well established tool in confirming the diagnosis of acute myocardial infarction.

Application
MAB<CK-MM>Mix is a main ingredient of the CK-MB assay.

Benefits
- Inhibit the CK-M subunit with more than 99% efficiency.

Product Description
Immunogen: Human creatinine kinase isoenzyme MM (h-CK-MM)
Inhibitor capacity (for information only): Determined by Roche test CK liquid (+37°C):
25 µg (=2.1 µl) antibody solution/ml Hitachi reagent inhibits
4500 U/l CK-MM: ≥99.6%
300 U/l CK-BB: ± 5%

Properties
The MAB<CK-MM>Mix consists of four highly specific monoclonal mouse antibodies directed to Human creatinin kinase isoenzyme MM (h-CK-MM). The frozen solution contains protein, potassium phosphate buffer and sodium chloride. No preservative are added.

Specification
Appearance: Slightly opalescent colorless solution
Protein (BCA): 10.8-13.2

pH value (+25°C): 7.4–7.6
Purity (TSK 3000): ≥ 90 area%
HPLC (Mono Q basic material): ≥80%
Aggregates (HPLC / TSK3000): ≤10%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 36 months. Avoid repeated freezing and thawing.

Background Information
Human creatine kinase isoenzyme CK-MB consist of two subunits: CK-M and CK-B. By inhibiting the CK-M subunit, the creatine kinase reaction is triggered exclusively by the β subunit of creatine kinase, which accounts for one-half of the activity of CK-MB.

Literature
Roche Applied Science, MABMix, May 2006

MAB<AFP>M-LJ738 IgG
lyophilizate

Cat. No.	Pack Size
11 492 101 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<AFP>M-LJ738-IGG(DE)". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<AFP>M-LJ738 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<AFP>M-TU11 IgG.

Product Description
Antibody class: IgG 1, kappa

Properties
MAB<AFP>M-LJ738 IgG is a monoclonal antibody directed to alpha fetoprotein. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<AFP>M-TU11 IgG
lyophilizate

Cat. No.	Pack Size
11 492 080 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<AFP>M-TU11-IGG(DE)". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<AFP>M-TU11 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<AFP>M-LJ738 IgG.

Product Description
Antibody class: IgG 2a, kappa

Properties
MAB<AFP>M-TU11 IgG is a monoclonal antibody directed to alpha fetoprotein. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Ccorresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<CEA>M-TU2 IgG
lyophilizate

Cat. No.	Pack Size
11 353 713 103	5, 10, 100 mg

Will be supplied as "MAK<CEA>M-TU2-IGG *SQ". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<CEA>M-TU2 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<CEA>M-TU3 IgG.

Product Description
Immunogen: Carcinoembryonic antigen (CEA)
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa

Properties
MAB<CEA>M-TU2 IgG is a monoclonal antibody directed to carcinoembryonic antigen. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride; pH 7.5. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear, to slightly opalescent solution in NaCl, 0.9% (c=5mg/ml)
Purity (HPLC / Mono Q): ≥90 area% of total protein
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<CEA>M-TU3 IgG
lyophilizate

Cat. No.	Pack Size
10 777 498 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<CEA>M-TU3-IGG(DE)". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<CEA>M-TU3 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<CEA>M-TU2 IgG.

Product Description
Antibody class: IgG 1, kappa

Properties
MAB<CEA>M-TU3 IgG is a monoclonal antibody directed to carcinoembryonic antigen. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear, to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area% of total protein
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<CK-MB>M-6.12.47 IgG
lyophilizate

Cat. No.	Pack Size
11 719 823 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<CK-MB>M-6.12.47 IGG". Unit of Measure is "mg".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<CK-MB>M-6.12.47 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<CK-MB>M-7.4.5 IgG.

Product Description
Antibody class: IgG 1, kappa

Properties
MAB<CK-MB>M-6.12.47 IgG is a monoclonal antibody directed to creatine kinase MB. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<DD>M-1.2.57 IgG
lyophilizate

Cat. No.	Pack Size
12 156 903 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<DD>M-1.2.57-IgG(SP/Q)". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core Modular Platform.

Application
MAB<DD>M-1.2.57 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<DD>M-2.1.16 IgG.

Product Description
Immunogen: Human fibrinogen cleavage product D-Dimer
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa

Properties
MAB<DD>M-1.2.57 IgG is a monoclonal antibody directed to human fibrinogen cleavage product D-Dimer. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret) : ≥0.6 mg/mg lyophilizate
Aggregated IgG (HPLC / TSK3000): ≤10 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<DD>M-2.1.16 IgG
lyophilizate

Cat. No.	Pack Size
12 045 206 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<DD>M-2.1.16-IgG(SP/Q)". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core Modular Platform.

Application
MAB<DD>M-2.1.16 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<DD>M-1.2.57 IgG.

Product Description
Immunogen: Human fibrinogen cleavage product D-Dimer
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa

Properties
MAB<DD>M-2.1.16 IgG is a monoclonal antibody directed to human fibrinogen cleavage product D-Dimer. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Aggregated IgG (HPLC / TSK3000): ≤10 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<Ferr>M-3.170 IgG
lyophilizate

Cat. No.	Pack Size
11 547 089 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<Ferr>M-3.170-IgG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<Ferr>M-3.170 IgG is highly qualified for heterogeenous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<Ferr>M-4.184 IgG.

Product Description
Immunogen: Human liver ferritin
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Spleen ferritin 74%; heart ferritin 11%

Properties
MAB<Ferr>M-3.170 IgG is a monoclonal antibody directed to human liver ferritin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<Ferr>M-4.184 IgG
lyophilizate

Cat. No.	Pack Size
11 547 119 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<Ferr>M-4.184-IgG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<Ferr>M-3.170 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<Ferr>M-3.170 IgG.

Product Description
Immunogen: Human liver ferritin
Spleen donor: Mouse balb/c
Antibody class: IgG 2a, kappa
Cross reactivity to: Spleen ferritin 60%; heart ferritin 11%

Properties
MAB<Ferr>M-4.184 IgG is a monoclonal antibody directed to human liver ferritin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<FSH>M-1.303 IgG
lyophilizate

Cat. No.	Pack Size
11 493 540 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<FSH>M-1.303-IGG". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<FSH>M-1.303 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<FSH>M-W3 IgG.

Product Description
Immunogen: Human follicle stimulating hormone (FSH)
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Human chorionic gonadotropin (HCG) <0.1%; Luteinizing hormone (LH) <1.5%; Thyroid stimulating hormone (TSH) <2.5%

Properties
MAB<FSH>M-1.303-IgG is a monoclonal antibody directed to human follicle stimulating hormone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<FSH>M-W3g IgG
lyophilizate

Cat. No.	Pack Size
11 493 531 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<FSH>M-W3-IGG". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<FSH>M-W3 IgG highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<FSH>M-1.303 IgG.

Product Description
Immunogen: Human follicle stimulating hormone (FSH)
Spleen donor: Mouse Balb/c
Antibody class: IgG 2a, kappa
Cross reactivity to: Human chorionic gonadotropin (HCG) not detectable; Luteinizing hormone (LH) <1.0%; Thyroid stimulating homone (TSH) <3.5%

Properties
MAB<FSH>M-W3 IgG is a monoclonal antibody directed to human follicle stimulating hormone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<HCG>M-INN2 IgG
lyophilizate

Cat. No.	Pack Size
03 116 263 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<HCG>M-INN2-IgG". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<HCG>M-INN2 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<HCG>M-INN22.

Product Description
Immunogen: Human chorionic gonadotropin b-chain (HCG)
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Luteinizing hormone (LH) <0,3%; Follicle stimulating hormone (FSH) <0.1%; Thyroid stimulating homone (TSH) <0.1%

Properties
MAB<HCG>M-INN2 IgG is a monoclonal antibody directed to human chorionic gonadotropin β-chain. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear, to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<HCG>M-INN22 IgG
lyophilizate

Cat. No.	Pack Size
11 812 564 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<HCG>M-INN22-IgG". Unit of Measure is "mg active ingredient".
DRY ICE
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<HCG>M-INN22 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAK<HCG>M-INN2.

Product Description
Immunogen: Human chorionic gonadotropin β-chain (HCG)
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Luteinizing hormone (LH) <5.0%; Follicle stimulating hormone (FSH) <0.2%; Thyroid stimulating hormone (TSH) <0.5%

Properties
MAB<HCG>M-INN22 IgG is a monoclonal antibody directed to human chorionic gonadotropin β-chain. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear, to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<H-S-Amy>M-Tu66C7 IgG
lyophilizate

Cat. No.	Pack Size
11 543 601 103	custom fill

Will be supplied as "MAK<H-S-Amy>M-Tu66C7-IgG(BR)SQ". Unit of Measure is "g active ingredient".
For further processing only.

For measurement of acute pancreatitis (pancreatic α-amylase) in human serum and urine selective blocking of salivary α-amylase isoenzyme is achieved in the presence of the pancreatic h-α-amylase.

Application
The combination of MAB<H-S-Amy>Tu88E8 and MAB<H-S-Amy>Tu66C7 inhibits the human salivary α-amylase ≥97% while maintaining the activity of the pancreatic h-α-amylase.

Benefits
Profit from the highly selective blocking of salivary α-amylase isoenzyme.

Product Description
Immunogen: Human salivary amylase
Spleen donor: Mouse balb/c
Antibody class: IgG 1, kappa
Clone: Tu66C7

Properties
MAB<H-S-Amy>M-Tu66C7 IgG fraction is purified by chromatography and lyophilized from a solution containing protein (≥20 mg/ml), potassium-phosphate buffer and NaCl. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Reconstitute with 0.9% saline solution (c=10 mg/ml)
Protein (Biuret): ≥0.7 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area% IgG
Cross reactivity to h-pancreas α-amylase: ≤1 U/gW
Function testing (synergetic effects at +37°C):
h salivary amylase + MAB <S-AMY>: ≤3% amylase activity
h pancreas amylase + MAB <S-AMY>: ≥98% amylase activity
Stability: At -15 to -25°C within specification range for 36 months. Avoid repeated freezing and thawing.

MAB<H-S-Amy>M-Tu88E8 IgG
lyophilizate

Cat. No.	Pack Size
11 543 598 103	custom fill

Will be supplied as "MAK<H-S-Amy>M-Tu88E8-IgG(BR)SQ". Unit of Measure is "g active ingredient".
For further processing only.

For measurement of acute pancreatitis (pancreatic α-amylase) in human serum and urine selective blocking of salivary α-amylase isoenzyme is achieved in the presence of the pancreatic h-α-amylase.

Application
The combination of MAB<H-S-Amy>Tu88E8 and MAB<H-S-Amy>Tu66C7 inhibits the human salivary α-amylase ≥97% while maintaining the activity of the pancreatic h-α-amylase.

Benefits
Profit from the highly selective blocking of salivary α-amylase isoenzyme.

Product Description
Immunogen: Human salivary amylase
Spleen donor: Mouse balb/c
Antibody class: IgG 2a, kappa
Clone: Tu88E8

Properties
MAB<H-S-Amy>M-Tu88E8 IgG fraction is purified by chromatography and lyophilized from a solution containing protein (≥20 mg/ml), potassium-phosphate buffer and NaCl. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear solution in NaCl, 0.9% (c=10 mg/ml)
Protein (Biuret): ≥0.7 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area% IgG
Cross reactivity to h-pancreas α-amylase: ≤1 U/gW
Function testing (synergetic effects at +37°C):
h salivary amylase + MAB : ≤3% amylase activity
h pancreas amylase + MAB : ≥98% amylase activity
Stability: At -15 to -25°C within specification range for 36 months. Avoid repeated freezing and thawing.

Literature
1) M. Gerber, K. Naujoks, H. Lenz, W. Gerhard, K. Wulff, Clin. Chem. ***31***, 1331 (1985)
2) M. Gerber, K. Naujoks, H. Lenz, K. Wulff, Clin. Chem. ***33***, 1158 (1987)

MAB<IGE>M-323 IgG
lyophilizate

Cat. No.	Pack Size
11 543 393 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<IGE>M-323-IgG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<IGE>M-323 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<IGE>M-7H8.

Product Description
Immunogen: Human IgE
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, light chain kappa
Cross reactivity to: Human IgM, IgG and IgA: Not detectable

Properties
MAB<IGE>M-323 IgG is a monoclonal antibody directed to human IgE. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilize
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<IGE>M-7H8 IgG
lyophilizate

Cat. No.	Pack Size
11 988 204 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<IGE>M-7H8-IGG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<IGE>M-7H8 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<IGE>M-323.

Product Description
Immunogen: Human IgE
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Human IgM, IgG and IgA not detectable

Properties
MAB<IGE>M-7H8 IgG is a monoclonal antibody directed to human IgE. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilize
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<INSULIN>M-BM1 IgG
lyophilizate

Cat. No.	Pack Size
12 208 725 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<INSULIN>M-BM1-IgG". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<INSULIN>M-BM1 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<INSULIN>M-ST3.

Product Description
Antibody class: IgG 1, kappa

Properties
MAB<INSULIN>M-BM1 IgG is a monoclonal antibody to insulin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<INSULIN>M-ST3 IgG
lyophilizate

Cat. No.	Pack Size
12 208 750 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<INSULIN>M-ST3-IgG". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<INSULIN>M-ST3 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<INSULIN>M-BM1.

Product Description
Antibody class: IgG 1, kappa
Cross reactivity to: Human pro insulin 1.2%; porcine insulin (strong recognition, determined by radio immuno assay(RIA)); bovine insulin (weak recognition, determined by RIA)

Properties
MAB<INSULIN>M-ST3 IgG is a monoclonal antibody directed to insulin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<LH>M-11412 IgG
lyophilizate

Cat. No.	Pack Size
11 547 925 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<LH>M-11412-IgG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<LH>M-11412 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<LH>M-2.406-IgG.

Product Description
Immunogen: Luteinizing hormone (LH)
Antibody class: IgG 1, kappa
Cross reactivity to: Human chorionic gonadotropin <0.1%

Properties
MAB<LH>M-11412 IgG is a monoclonal antibody directed to luteinizing hormone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<LH>M-2.406 IgG
lyophilizate

Cat. No.	Pack Size
11 547 038 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<LH>M-2.406-IgG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<LH>M-2.406 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<LH>M-11412 IgG.

Product Description
Immunogen: Luteinizing hormone (LH)
Antibody class: IgG 1, kappa
Cross reactivity to: Human chorionic gonadotropin (HCG) not detectable; Follicle stimulating hormone (FSH) <0.3%; Thyroid stimulating hormone (TSH) <0.3%

Properties
MAB<LH>M-2.406-IgG is a monoclonal antibody directed to luteinizing hormone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<PRL>M-C4E4 IgG
lyophilizate

Cat. No.	Pack Size
11 458 701 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<PRL>M-C4E4-IGG". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<PRL>M-C4E4 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<PRL>M-H12G10.

Product Description
Antibody class: IgG 1, kappa
Cross reactivity to: Human chorionic gonadotropin (HCG) not detectable; Luteinizing hormone (LH) not detectable; Thyroid stimulating homone (TSH) not detectable.

Properties
MAB<PRL>M-C4E4 IgG is a monoclonal antibody directed to prolactin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

MAB<PRL>M-H12G10 IgG
lyophilizate

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<PRL>M-H12G10 IgG is highly qualified for heterogeneous Immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<PRL>M-C4E4 IgG.

Product Description
Antibody class: IgG 2a, kappa
Cross reactivity to: Human chorionic gonadotropin (HCG) not detectable; Luteinizing hormone (LH) not detectable; Thyroid stimulating hormone (TSH) not detectable.

Properties
MAB<PRL>M-H12G10 IgG is a monoclonal antibody directed to prolactin. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 60 months. Avoid repeated freezing and thawing.

Cat. No.	Pack Size
11 027 689 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<PRL>M-H12G10-IGG". Unit of Measure is "mg active ingredient".
For further processing only.

MAB<TSH>M-A8 IgG
lyophilizate

Cat. No.	Pack Size
11 367 978 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<TSH>M-A8-IGG(BR)". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<TSH>M-A8 IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<TSH>M-Tu1.20.

Product Description
Immunogen: Human thyroid stimulating hormone
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Luteinizing hormone (LH) <0.1%; Follicle stimulating hormone (FSH) <0.1%

Properties
MAB<TSH>M-A8 IgG is a monoclonal antibody directed to thyroid stimulating homone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate
Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

MAB<TSH>M-TU1.20 IgG
lyophilizate

Cat. No.	Pack Size
10 767 778 103	5 mg (samples), ≥50 mg (custom fill)

Will be supplied as "MAK<TSH>M-TU1.20-IGG(DE),LYO.". Unit of Measure is "mg active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
MAB<TSH>M-Tu1.20 IgG is highly qualified for heterogenous immunoassays.

Benefits
Rely on optimal results obtained with sandwich partner MAB<TSH>M-A8.

Product Description
Immunogen: Human thyroid stimulating hormone
Spleen donor: Mouse Balb/c
Antibody class: IgG 1, kappa
Cross reactivity to: Luteinizing hormone (LH) <0.2%; Follicle stimulating hormone (FSH) <3.0%.

Properties
MAB<TSH>M-Tu1.20 IgG is a monoclonal antibody directed to thyroid stimulating hormone. It is lyophilized from a solution containing protein, potassium phosphate buffer and sodium chloride. No preservatives are added.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c=10mg/ml)
Protein (Biuret): ≥0.6 mg/mg lyophilizate

Purity (HPLC / Mono Q): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

PAB<CRP>S IgG
frozen solution

Cat. No.	Pack Size
11 888 714 103	custom fill

Will be supplied as "PAK<CRP>S-IgG *SQ". Unit of Measure is "l".
DRY ICE
For further processing only.

For measurement of c-reactive protein (CRP).

Application
Use PAB<CRP>S IgG for turbidimetric / nephelometric assays. It can be coupled to latex surfaces and used in the respective assays.

Benefits
Detect aggregates of PAB<CRP>S IgG with CRP by turbidimetric measurements (λ 340/700 nm).

Product Description
Immunogen: Human C-reactive protein

Properties
The polyclonal antibody IgG directed to c-reactive protein is produced in sheep. It is prepared as solution containing protein (≥40 g/l); Tris buffer with NaN_3, 0.09% (w/v).
Recommended working concentration: 15 mg/ml
Remark: When stored over longer periods at +4°C, a slight turbidity may occur which can easily be removed by centrifugation. No alteration of antibody properties occurs thereby.

Specification
Appearance: Clear to slightly opalescent yellowish solution
pH value (+25°C): 7.8-8.2
Protein (Biuret): 50-60 mg/ml
Purity (HPLC): ≥ 90 area%
Bioburden: ≤ 1000 CFU/ml
Function: Calibration curve characterization defined by turbidimetric measurement A_{340}/A_{700}
δA (Standard 1mg/dl): ≥0.025
δA (Standard 10mg/dl): ≥0.230
δA (Standard 25mg/dl): ≥0.480
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Background Information
C-reactive protein (CRP) is part of the β-globulin family found in human plasma. Increased levels of CRP are involved in a variety of inflammatory diseases. Furthermore elevated CRP serum levels indicate tissue injury, transplant rejection, carcinogenesis and acute myocardial infarction.

PAB<T3>S IgG
lyophilizate

Cat. No.	Pack Size
10 907 332 103	10 mg (samples), ≥50 mg (custom fill)

Will be supplied as "PAK<T3>S-IGG(DE),(ES 3G)". Unit of Measure is "g active ingredient".
For further processing only.

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
PAB<T3>S IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on the optimal design for competitive assay formats.

Product Description
PAB<T3>S IgG is a polyclonal antibody directed to trijodothyronine produced in sheep.

Immunogen: Trijodothyronine derivative.

Specification
Appearance: White lyophilizate
Protein (A_{280}): ≥0.7 mg/mg lyophilizate
HPLC (HPLC / TSK 3000): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

PAB<T4>S IgG
lyophilizate

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application
PAB<T4>S IgG is highly qualified for heterogeneous immunoassays.

Benefits
Rely on the optimal design for competitive assay formats.

Product Description
PAB<T4>S IgG is a polyclonal antibody directed to trijodothyronine produced in sheep.
Immunogen: Trijodothyronine derivative.

Specification
Appearance: White lyophilizate
Protein (A_{280}): ≥0.7 mg/mg lyophilizate
HPLC (HPLC /TSK 3000): ≥90 area%
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
10 767 794 103	10 mg (samples), ≥50 mg (custom fill)

Will be supplied as "PAK<T4>S-IGG(DE),(ES)". Unit of Measure is "mg active ingredient".
For further processing only.

Streptavidin, recombinant

from *Streptomyces avidinii*, expressed in *E. coli*, lyophilizate

Biotin/Streptavidin Portfolio

Application

Use Streptavidin, recombinant as a tool for solid phase technology and universal detection systems in immunology and molecular diagnostics.

Benefits

- Rely on a complete solution using highly qualified reagents in combination with activated Biotin Esters.

Specification

Appearance: White lyophilizate
Protein (A_{282}; factor 3.1): 0.6–0.8 mg/mg lyophilizate
Specific activity/Biotin binding capacity: ≥17 U/mg protein
Proteasen (incubation with Azocoll for up to 24 hours at +25°C): ≤0.001 U/mg
Absorption (A_{405}, against repurified water): ≤0.01
Water (K. Fischer): ≤12%
IEF (pH 6-9): Two main bands between 6.8 and 7.5
SDS-PAGE: Chromatographically homogeneous
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Background Information

Streptavidin consists of four subunits with a molecular weight of 13 kD, each containing a single biotinbinding site. Each subunit has six thyrosine residues. The protein is carbohydrate free.
Streptavidin + 4 biotin -> streptavidin · $(biotin)_4$
The formation of the complex is measured at 233 nm.

Cat. No.	Pack Size
11 520 679 103	custom fill

Will be supplied as "Streptavidin Special Quality". Unit of Measure is "g active ingedient".
For further processing only.

D-Biotin-N-hydroxysuccinimide ester
crystalline powder

Biotin/Streptavidin Portfolio

Application
Use D-Biotin-N-hydroxysuccinimide ester as biotinylating reagent for proteins and aminolabeled oligonucleotides.

Benefits
- Rely on a complete solution using highly qualified reagents in combination with Streptavidin.

CAS: 35013-72-0

Properties
Nomenclature: D-Biotinyl-N-hydroxy-succinimide ester
Formula: $C_{14}H_{19}N_3O_5S$
Molecular weight: 341.4 D
Remark: Under mild conditions the activated ester reacts with amino groups. The aminocaproic acid spacer is useful if biotinylated macromolecules are coupled because steric hindrance is minimized.

Specification
Appearance: White crystallizate
Biotin ester (from N): 98-103%
N (elementary analysis): 12.0-12.73%
Purity (TLC: silica gel, 1-butanol/glacial acetic acid/H_2O= 2/1/1; a) in UV; b) with $KMnO_4$): Chromatographically homogeneous
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
10 734 250 103	custom fill

Will be supplied as "D-Biotin-N-hydroxy- succinimide Ester". Unit of Measure is "g".
For further processing only.

D-Biotinoyl-ε-aminocaproic acid-N-hydroxysuccinimide ester
powder

Biotin/Streptavidin Portfolio

Application
Use D-Biotinoyl-ε-aminocaproic acid-N-hydroxysuccinimide ester as biotinylating reagent for proteins and aminolabeled oligonucleotides.

Benefits
- Rely on a complete solution using highly qualified reagents in combination with Streptavidin.

CAS: 72040-63-2

Properties
Nomenclature: D-Biotinyl-ε-amido caproic acid N-hydroxysuccinimid ester
Formula: $C_{20}H_{30}N_4O_6S$
Molecular weight: 454.5 D
Remark: Under mild conditions the activated ester reacts with amino groups. The aminocaproic acid spacer is useful if biotinylated macromolecules are coupled because steric hindrance is minimized.

Specification
Appearance: White to beige powder
Biotin ester (from N): ≥97%
N (elementary analysis): 11.9-12.8%
C (elementary analysis): 51.0-54.7%
H (elementary analysis): 6.4 to 6.9%
Purity (TLC: silica gel, 1-butanol/glacial acetic acid/H_2O= 50/15/25, iodide stream/UV): Chromatographically homogeneous
Hydrolysis product (NMR): ≤20%
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
11 003 933 103	custom fill

Will be supplied as "D-Biotinyl-e-aminocap. AcidN-Hydroxy Succ.". Unit of Measure is "g".
For further processing only.

Streptavidin R-Phycoerythrin LumiGrade Reagent

Ready to use solution

Standard for highly sensitive fluorescent detection.

Application

Conjugated reporter dyes such as Streptavidin R-Phycoerythrin (SA-PE) are well established for Luminex's xMAP Assay Kits or array-based applications due to their excellent spectral characteristics. Their dedicated and reproducible design ensure high performance multiplex assays using antibodies, receptors, peptides and oligonucleotides.

Benefits

- Improve detection and quantification due to high signal-to-noise combined with very low background .
- Rely on premium production quality that results in:
  - excellent lot-to-lot consistency
  - high purity
  - ready to-use solution
  - reagent stability up to 24 months at +2 to +8°C

Product Description

The Streptavidin R-Phycoerythrin LumiGrade conjugate contains Phycoerythrin from red algae (RPE) and Streptavidin (SA), recombinant.

Properties

High molecular weight conjugate size distribution (700-1200 kD).

Specification

Appearance: Reddish solution in potassium phosphate, 50 mmol/l, pH 6.8, sodium azide, 0.05% (c=1 mg/ml)
Streptavidin (A_{280}): 16-21 weight%
Absorption ratio $A_{566/280}$: >3.3
Protein: 1.00 ± 0.10 mg/ml
Content of color relating to SA: 0.95-1.40 (molar ratio RPE : SA)
Purity (HPLC/ TSK 3000 XL): free SA <1%
Fluorescence emission: Maximum/intensity
488 nm excitation: 576 nm ± 5 / ≥200
545 nm excitation : 576 nm ± 5 / ≥250
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
05 065 925 103	1, 5, 100 ml, custom fill

Will be supplied as "Streptavidin R-Phycoerythrin Lumi Grade Reagent". Unit of Measure is "mg active ingredient".
For further processing only.

Streptavidin R-Phycoerythrin LumiGrade Ultrasensitive Reagent

Ready to use solution

Standard for ultrasensitive fluorescent detection.

Application

Conjugated reporter dyes such as Streptavidin R-Phycoerythrin (SA-PE) are well established for Luminex's xMAP® Assay Kits and array-based applications due to their excellent spectral characteristics. Their dedicated and reproducible design ensure high performance multiplex assays using antibodies, receptors, peptides and oligonucleotides.

Benefits

- Improve detection and quantification due to high signal-to-noise combined with very low background .
- Rely on the superior production quality that results in:
  - excellent lot-to-lot consistency
  - high purity
  - ready to-use solution
  - reagent stability 12 months at +2 to +8°C

Product Description

The Streptavidin R-Phycoerythrin LumiGrade conjugate contains Phycoerythrin (PE) from red algae and Streptavidin (SA), recombinant.

Properties

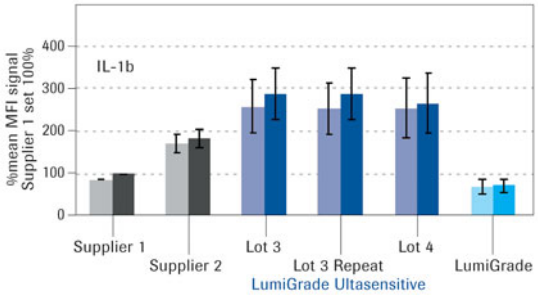
High molecular weight conjugate size distribution (1,500-50,000 kD).

Specification

Appearance: Reddish solution in potassium phosphate, 50 mmol/l, pH 6.8, sodium azide, 0.05% (c=1 mg/ml)
A_{566}: 0.73-0.81
SA-R-PE from R-Phycoerythrin (A_{566}/7.7): 0.95-1.05 mg/ml
Purity (HPLC / TSK 6000): ≥ 99.7 area%
Contamination (HPLC / TSK 6000): ≤ 0.3 area%
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
05 351 693 103	1, 100 ml, custom fill

Will be supplied as "Streptavidin R-Phycoerythrin Lumi Grade ultrasensitive". Unit of Measure is "mg active ingredient".



Excellent lot-to-lot consistency: Streptavidin R-Phycoerythrin LumiGrade Ultrasensitive conjugates of lot 3 and 4 show very consistent readouts with high signal-to-noise in the Interleukin 1b xMAP® Assay. Streptavidin R-PE of Supplier 1 serves as reference, normalized to 100% for each concentration. Mean values of ± Standard Deviation excluding blank values are shown.

For further processing only.

Multi Analyte Stripe
universal device

Cat. No.	Pack Size
05 354 358 103	50 stripes in 1 box

Will be supplied as "Multi Analyte Stripe". Unit of Measure is "piece".
Minimum order size: 85 000 single strips.
For further processing only.

Universal test stripe

Application
Use the Multi Analyte Stripes for a range of applications, such as classical sandwich immunoassays to NA/Oligo-detection.

Benefits
- Receive qualitative results in less than 10 minutes.

Product Description
Test stripes are delivered in boxes, each containing 50 stripes.

Specification
Components of the test stripe (4.6 nm):
MAB<Dig>IgG on gold conjugate: 0.2 µg per test stripe
Poly-Streptavidin (result line): 0.8 µg per test stripe
PAB<MouseFc>IgG (control line): 0.1 µg per test stripe
Sensitivity (analytical):
A biotin/-digoxigenin-peptide in 700µl buffer solution at a concentration of 50 pg/ml is visually detected as positive on the basis of the result line in the read out zone after chromatography.
Specificity (analytical):
The test stripes don't show a visible result line after chromatography of 700 µl buffer without adding biotin/-digoxigenin-peptide (negative control).
Stability: At +2 to +8°C from date of manufacturing for 18 months.
Remark: The Multi Analyte Stripe is an immunoassay test stripe employing anti-biotin/anti-digoxigenin.

Streptavidin Magnetic Particles
suspension

Cat. No.	Pack Size
11 636 502 103	custom fill

Will be supplied as "Streptavidin Magnetic-Particles". Unit of Measure is "g active ingedient".
For further processing only.

Streptavidin-coated magnetic particles

Application
Use Streptavidin Magnetbeads for the fast and simple separation of a variety of biotin-labeled molecules in solution. This includes single mRNA, oligo-nucleotides, DNA, DNA fragments, glycoconjugates and protein isolation. Streptavidin Magnetbeads can also be used as a solid phase within liquid ELISA systems.

Benefits
- Use the highly suitable streptavidin-coated magnetic particles for sensitive isolation and detection systems.

Properties
The beads show very high lot-to-lot consistency and are already included in standard applications. They are offered in a protease- and DNase/RNase-free format.

Specification
Appearance: Brown suspension
Content: 9-11 mg/ml (solid binding)
Performance test in mRNA-HS-kit: Funtion corresponds
Specific activity/Biotin binding capacity: ≥1800 pmol/mg
Proteases (incubation for up to 30 minutes at +37°C, casein-resorufin-marked): Not detectable

RNases (incubation for up to 4 hours at +37°C): Not detectable
DNases (incubation for up to 4 hours at +37°C): Not detectable
Unspecific binding of protein: Not detectable
Stability: At +2 to +8°C within specification range for 24 months.

StreptaWell, 384 plate
transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
11 974 998 103	custom package

Will be supplied as "TRSA-SA MTP 384-well, clear". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C1 (standard bind)
SA-coated area: ≥90 µl/well
Blocked volume:>90 µl/well
Coating variance (CV): ≤8%
Total biotin binding capacity (competition assays): ≥1.5 ng/well
Homogeneity [VK] of series:≤15%
Bleeding: <5 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, 384 plate
white, coated with recombinant streptavidin

Cat. No.	Pack Size
11 974 980 103	custom package

Will be supplied as "TRSA-SA MTP 384-well, white". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C1 (standard bind)
SA-coated area: ≥90 µl/well
Blocked volume:>90 µl/well

Coating variance (CV): ≤8%
Total biotin binding capacity (competition assays): ≥1.5 ng/well
Homogeneity [VK] of series:≤15%
Bleeding: <5 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, C1, breakapart

transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
03 246 507 103	custom package

Will be supplied as "SA-MTP (N-breakap. transp./C1)". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application

Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits

- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification

Type of coating: C1 (standard bind)
SA-coated area: ≥250 µl/well
Blocked volume:>250 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥5 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: >5 ngSA/well
Stability: At +2 to +8°C within specification range for 48 months.

StreptaWell, C8 module, high binding capacity

white, coated with recombinant streptavidin

Cat. No.	Pack Size
11 975 021 103	custom package

Will be supplied as "TRSA-Bi/SACP) C8 plate, white". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application

Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits

- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification

Type of coating: C2 (high bind)

SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥25 ng/well
Homogeneity [VK] of series:≤10%
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, C8, breakapart, high binding capacity

transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
11 986 694 103	custom package

Will be supplied as "SA-MTP (N-breakap.C8/C2 plus)". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application

Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8–10 weeks.

Benefits

- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification

Type of coating: C2 (high bind)
SA-coated area: ≥250 µl/well
Blocked volume:>250 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥20 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: >5 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, C8, lockwell

transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
04 869 532 103	custom package

Will be supplied as "SA-MTP (NUNC LOCKWELL C8 TRANSP/C1)". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application

Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits

- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C1 (standard bind)
SA-coated area: ≥250 µl/well
Blocked volume:>250 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥5 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: >2 ngSA/well
Stability: At +2 to +8°C or at +15 to +25°C within specification range for 36 months.

StreptaWell, C96 plate
white, coated with recombinant streptavidin

Streptavidin-coated microwell plates

Cat. No.	Pack Size
11 975 005 103	custom package

Will be supplied as "TRSA-SA MTP C96 Plate, white". Unit of Measure is "piece".
For further processing only.

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C1 (standard bind)
SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥5 ng/well
Homogeneity [VK] of series:≤10%
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, C96 plate, high binding capacity
transparent, coated with recombinant streptavidin

Streptavidin-coated microwell plates

Cat. No.	Pack Size
11 975 030 103	custom package

Will be supplied as "TRSA-Bi/SACP) C96 plate, clear". Unit of Measure is "piece".
For further processing only.

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification

Type of coating: C2 (high bind)
SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥25 ng/well
Homogeneity [VK] of series:≤10%
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, C96 plate, high binding capacity

white, coated with recombinant streptavidin

Streptavidin-coated microwell plates

Cat. No.	Pack Size
11 975 013 103	custom package

Will be supplied as "TRSA-Bi/SACP) C96 Plate, white". Unit of Measure is "piece".
For further processing only.

Application

Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits

- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification

Type of coating: C2 (high bind)
SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥25 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: >5 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, F8 module
transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
11 940 279 103	custom package

Will be supplied as "SA coated MTP Nunc F8". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8 –10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C1 (standard bind)
SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): <5%
Total biotin binding capacity (competition assays): ≥5 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: >2 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

StreptaWell, F8 module, high binding capacity
transparent, coated with recombinant streptavidin

Cat. No.	Pack Size
11 965 875 103	custom package

Will be supplied as "SA-MTP (Nunc F8 transp./C2+)". Unit of Measure is "piece".
For further processing only.

Streptavidin-coated microwell plates

Application
Use Streptavidin-coated microplates in all kinds of immunoassays as well as in assay systems for detecting protein-nucleic acid interactions and nucleic assay amplification and hybridization. Various types of transparent and white streptavidin-coated plates (96- and 384-well) are available for colorimetric, chemiluminescent and fluorescent applications. The minimum order size is 500 plates/order with a delivery time of 8–10 weeks.

Benefits
- Rely on Roche StreptaWell plates combining excellent signal to noise ratio with increased sensitivity and extremely low bleeding properties.
- Use Roche StreptaWell plates to achieve superb intra- and inter-assay precision.

Specification
Type of coating: C2 (high bind)
SA-coated area: ≥300 µl/well
Blocked volume:>300 µl/well
Coating variance (CV): >5%
Total biotin binding capacity (competition assays): ≥25 ng/well
Homogeneity [VK] of series:≤10%
Bleeding: <5 ngSA/well
Stability: At +2 to +8°C within specification range for 36 months.

Colloidal Gold 20 nm
suspension

Cat. No.	Pack Size
05 418 291 103	1, 5, 25 l

Will be supplied as "Colloidal Gold 20 nm". Unit of Measure is "l". For further processing only.

Colloidal Gold is well known as an established labeling tool for a broad range of blotting and diagnostic applications and for electron- /light microscopy.

Application
Use Colloidal Gold, 20 nm as conjugation partner for all kind of antibodies, proteins and macromolecules. It is recommended for low to medium sensitive assays.

Benefits
- Rely on the highly lot-to-lot consistent quality: Colloidal Gold 20 nm is manufactured in unique production lots of up to 250 l.

Product Description
The 20 nm Goldsol quality is red and spherical. The ready to use "gold suspension" is pH adjusted.

Properties
"Citrate Gold" obtained from reduction of Tetrachloro-auric acid ($HAuCl_4$) with citric acid.

Specification
Appearance: Clear, light red liquid
Particle size: 19-23 nm
Particle concentration (A_{520} unit): 0.85-1.00
λ_{max}: 516.0-518.5 nm
Stability: At +2 to +8°C within specification range for 12 months.

Background Information
Due to it's intense red color Colloidal Gold is one of the basic components for test strip development and manufacturing.

Colloidal Gold 40 nm
suspension

Cat. No.	Pack Size
05 416 744 103	1, 5, 25 l

Will be supplied as "Colloidal Gold 40 nm". Unit of Measure is "l". For further processing only.

Colloidal Gold is well known as an established labeling tool for a broad range of blotting and diagnostic applications and for electron- /light microscopy.

Application
Use Colloidal Gold, 40 nm as conjugation partner for all kind of antibodies, proteins and macromolecules. It is recommended for high sensitive assays due to its unique shape and color.

Benefits
- Rely on the highly lot-to-lot consistent quality: Colloidal Gold 40 nm is manufactured in unique production lots of up to 250 l.

Product Description
The 40 nm Goldsol quality is red/violet ("potato shape"). The ready to use "gold suspension" is pH adjusted.

Properties
"Citrate Gold" obtained from reduction of Tetrachloro-auric acid ($HAuCl_4$) with citric acid.

Specification
Appearance: Turbid, slightly opalescent raspberry red liquid
Particle size: 38.0-43.0 nm
Particle concentration (A_{520} unit): 1±0.2

λ_{max}: 531±1 nm
Stability: At +2 to +8°C within specification range for 12 months.

Background Information

Due to it's intense red/violet color Colloidal Gold is one of the basic components for test strip development and manufacturing.

Interference Eliminating Proteins

Interference elimination is an important differentiation factor and challenging task for state-of the art immunoassay development and kit manufacturing. Test applications with increased sensitivity, better precision, improved test accuracy and optimized handling convenience demand powerful tools for efficient interference elimination.

Roche's product line of interference eliminating proteins (non-specific and specific for antibody interferences) can be combined to meet the specific test requirements.

Framework IEP
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
Use the monoclonal MAB33 Framework-IEP to eliminate monomeric (immuno-response) and highly specific interferences directed against the framework regions of antibodies. Its interference eliminating strength is based on identical immunoreactive amino acid sequences in the framework regions of the test antibody.

Benefits
- Eliminate exclusively interference to produce improved assay performance.
- Increase the assay sensitivity and accuracy.
- Profit from higher precision, greater accuracy and optimized handling convenience.

Product Description
Immunogen: PTH
Spleen donor: Mouse Balb/c
Antibody class: IgG1, kappa
Preparation: MAB33 Framework IEP is lyophilized from a solution containing protein, potassium phosphate and NaCl. No further preservatives are added.

Properties
Molecular structure: IgG1, monomer
Remark: Cannot be used in test systems for determination of PTH.
Serum concentrations of CK-MM: ≤3 U/ml have shown neither influence on interference elimination properties nor on recovery of analyte.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in NaCl, 0.9% (c=10 mg/ml)
Purity (HPLC): ≥90% IgG of total protein
Functional activity (relative titer based on masterlot determined by MTP assay): ≥80%
Recommended working concentration: 20-5,000 µg/ml incubation buffer
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Literature
See ***MAB33-IgG1***.

Cat. No.	Pack Size
03 369 846 103	5, 50, 250 mg

Will be supplied as "Framework IEP *SQ". Unit of Measure is "mg active ingredient".
For further processing only.

HAMA Serum, Type 1
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
HAMA Serum Type 1 is primarily intended for polyvalent and spontaneous HAMA interference occurring in healthy donors.

Benefits
- Rely on a reproducible source for positive HAMA interference samples in immunoassays.
- Use HAMA Serum Type I as positive control for test development and quality control purposes.

Product Description
HAMA Serum Type 1 is a lyophilized human serum with serum ingredients within normal range. No preservative are added. The product must be handled just as carefully as patient specimens.

Properties
pH value (+25°C): 7-8
Protein (Biuret): ≥65 mg/vial
Analyte concentrations determined by Roche Elecsys® -Tests:
Alpha fetoprotein (AFP): 2.0 IU/ml
Carcinoembryonic antigen (CEA): 1.3 ng/ml
Follicle stimulating hormone (FSH): 10.0 mIU/ml
Human chorionic gonadotropin (HCG): 2.8 mIU/ml
Luteinizing hormone (LH): 8.1 mIU/ml
Prolactin: 160.7 µIU/ml
Prostate specific antigen (PSA): 0.3 ng/ml
PSA free: 0.06 ng/ml
Thyroid stimulating homone (TSH): 2.5 µIU/ml
Troponin T (TN-T): Not detectable

Specification
Appearance: Yellowish lyophilizate
Interference effect: Corresponds to specification
Infectious parameters (determined by FDA approved methods):
HbsAg: negative
Anti HIV 1+2: Negative
Anti HCV: Negative
HIV 1 Ag: Negative
Stability: At -15 to - 25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Background Information
HAMA serum interferences in immunoassays can vary within a broad range depending on the person's immune system.

Literature
Roche Applied Science, Interference-Eliminating Proteins for the Diagnostics Industry, 7 ed., July 2009

Cat. No.	Pack Size
11 767 275 103	custom fill

Will be supplied as "Hama-Serum 1- Qual. Standard *SQ". Unit of Measure is "piece".
For further processing only.

HAMA Serum, Type 2
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
HAMA Serum Type 2 primarily represents mono-/bivalent and specific HAMA interference occurring after treatment with monoclonal antibodies.

Benefits
- Rely on a reproducible source for HAMA interference material in immunoassays.
- Use HAMA Serum Type 2 as positive control development and quality control purposes.

Product Description
HAMA Serum Type 2 is a lyophilized human serum with serum ingredients within normal range. No preservative are added. The product must be handled just as carefully as patient specimens.

Properties
pH value (+25°C): 7-8
Protein (Biuret): ≥65 mg/vial
Analyte concentrations determined by Roche Elecsys® -Tests:
Alpha fetoprotein (AFP): 3.5 IU/ml
Carcinoembryonic antigen (CEA): 1.2 ng/ml
Follicle stimulating hormone (FSH): 7.0 mIU/ml
Human chorionic gonadotropin (HCG): 3.0 mIU/ml
Luteinizing hormone (LH): 6.7 mIU/ml
Prolactin: 114 µIU/ml
Prostate specific antigen (PSA): 0.3 ng/ml
PSA free: 0.05 ng/ml
Thyroid stimulating homone (TSH): 1.6 µIU/ml
Troponin T (TN-T): 0.01 ng/ml

Specification
Appearance: Yellowish lyophilizate
Interference effect: Corresponds to specification
Infectious parameters:
HbsAg: Negative
Anti HIV 1+2: Negative
Anti HCV: Negative
HIV 1 Ag: Negative
Stability: At -15 to -25°C within specification range for 24 months.

Background Information
HAMA serum interferences in immunoassays can vary within a broad range depending on the person's immune system.

Literature
Roche Applied Science, Interference-Eliminating Proteins for the Diagnostics Industry, 7 ed., July 2009

Cat. No.	Pack Size
05 167 060 103	custom fill

Will be supplied as "HAMA Serum 2L *SQ". Unit of Measure is "piece".
For further processing only.

MAB IgG2b/Fab2a Poly
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
Use the polymer MAB IgG2b/Fab2a Poly to reduce polymeric interference against IgG2a and/or IgG2b antibodies. It also covers Fab neo-epitopes.

Benefits
- Eliminate exclusively interference to produce improved assay performance.
- Increase the assay sensitivity and accuracy.
- Profit from higher precision, greater accuracy and optimized handling convenience.

Product Description
Immunogen: DPH (2b), human S-AMY (2a)
Spleen donor: Mouse Balb/c
Antibody class: IgG2b, kappa/IgG2a, kappa
Preparation: Lyophilized from a solution containing potassium phosphate and NaCl and 6% sucrose . No further preservatives are added.

Properties
Molecular structure: IgG2a-Fab, polymerized with IgG2b; defined molecular range distribution
Remarks: Cannot be used in test systems for determination of DPH, human S-AMY.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in NaCl, 0.9% (c=5 mg/ml)
Functional activity (relative titer based on master lot determined by MTP assay): ≥80%
Recommended working concentration: 0.5-500 µg/ml incubation buffer
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Literature
1) E. Mössner, H. Lenz, G. Bienhaus, Poster: AACC/IFCC (1990)
2) E. Mössner, H. Lenz, G. Bienhaus, Clin. Chem. ***36***, 1093 (1990)
3) R. Valdes, J. Clin. Imm. ***15/2***, 87 (1992)
4) H. Vaidya, Clin. Chem. ***38/9***, 1737 (1992)
5) St. Avrameas, Mol. Imm. ***30/12***, 1133 (1993)
6) E. Wilkinson, Clin. Chem. ***39/10***, 2166 (1993)
7) L.J. Kricka, Clin. Chem of Acta **215**, 153 (1993)
8) H.J. Hansen, J. Clin. Imm. ***16/4***, 294 (1993)
9) M. Kuroki, J. Imm. Meth. ***180***, 81 (1995)
10) R. Sapin, Clin. Chem. ***41/1***, 117 (1995)
11) H. Schlebusch et al., Hybridoma ***14***, 167, 74 (1995)
12) P. Mikrosch, Eur. J. Chem. Biochem. ***35/11***, 881 (1997)
13) U. Hasholzner, Anticancer Research, ***17***, 3055 (1997)
14) St. Levison, J. Clin. Ligand Assay ***20/2***, 180 (1997)
15) L.J. Kricka, Clin. Chem. ***45/7***, 942 (1999)
16) Roche Applied Science, Interference-Eliminating Proteins for the Diagnostics Industry, 7 ed., July 2009

Cat. No.	Pack Size
11 355 830 103	5, 50, 250 mg

Will be supplied as "MAB-IgG(2b)/Fab(2a) Polymer, PolyMAB2b/2a". Unit of Measure is "mg active ingredient". For further processing only.

MAB33 IgG1
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
Use MAB33 IgG1 for test formulations employing intact IgG1.MAB33 IgG1 is especially suitable for the elimination of monomeric and specific interference.

Benefits
- Eliminate exclusively interference to produce improved assay performance.
- Increase the assay sensitivity and accuracy.
- Profit from higher precision, greater accuracy and optimized handling convenience.

Product Description
Immunogen: h CK-MM
Spleen donor: Mouse Balb/c
Antibody class: IgG1, kappa
Preparation: Lyophilized from a solution containing potassium phosphate and NaCl. No further preservatives are added.

Properties
Molecular structure: IgG1, monomer
Remarks: Cannot be used in test systems for determination of CK-MM and CK-MB.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in NaCl, 0.9% (c=10 mg/ml)
Protein (Biuret): 0.7 mg protein/mg lyophilizate
Purity (HPLC / Mono Q): ≥95 area% IgG of total protein
Functional activity (relative titer based on master lot determined by MTP assay): ≥80%
Recommended working concentration: 50-5000 µg/ml incubation buffer
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Background Information
MAB33 IgG1 is a monoclonal antibody with defined specificity.

Literature
1) E. Mössner, H. Lenz, G. Bienhaus, Poster: AACC/IFCC (1990)
2) E. Mössner, H. Lenz, G. Bienhaus, Clin. Chem. ***36***, 1093 (1990)
3) R. Valdes, J. Clin. Imm. ***15/2***, 87 (1992)
4) H. Vaidya, Clin. Chem. ***38/9***, 1737 (1992)
5) St. Avrameas, Mol. Imm. ***30/12***, 1133 (1993)
6) E. Wilkinson, Clin. Chem. ***39/10***, 2166 (1993)
7) L.J. Kricka, Clin. Chem of Acta **215**, 153 (1993)
8) H.J. Hansen, J. Clin. Imm. ***16/4***, 294 (1993)
9) M. Kuroki, J. Imm. Meth. ***180***, 81 (1995)
10) R. Sapin, Clin. Chem. ***41/1***, 117 (1995)
11) H. Schlebusch et al., Hybridoma ***14***, 167, 74 (1995)
12) P. Mikrosch, Eur. J. Chem. Biochem. ***35/11***, 881 (1997)
13) U. Hasholzner, Anticancer Research, ***17***, 3055 (1997)
14) St. Levison, J. Clin. Ligand Assay ***20/2***, 180 (1997)
15) L.J. Kricka, Clin. Chem. ***45/7***, 942 (1999)
16) Roche Applied Science, Interference-Eliminating Proteins for the Diagnostics Industry, 7 ed., July 2009

Cat. No.	Pack Size
11 200 941 103	custom fill

Will be supplied as "MABM-33-IgG(DE),SQ MAB 33". Unit of Measure is "g active ingredient".
For further processing only.

MAB33 IgG1/Fab1 Poly
lyophilizate

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
Use the polymer MAB33 IgG1/Fab1 Poly for assays working with Fab-conjugates.

Benefits
- Eliminate exclusively interference to produce improved assay performance.
- Increase the assay sensitivity and accuracy.
- Profit from higher precision, greater accuracy and optimized handling convenience.

Product Description
Immunogen: h CK-MM
Spleen donor: Mouse Balb/c
Antibody class: IgG1
Preparation: Lyophilized from a solution containing potassium phosphate and NaCl and 6%sucrose. No further preservatives are added.

Properties
Molecular structure: IgG1-Fab, polymerized with IgG1; defined molecular range distribution
Remarks: Cannot be used in test systems for determination of CK-MM and CK-MB.

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in NaCl, 0.9% (c=10 mg/ml)
Functional activity (relative titer based on master lot determined by MTP assay): ≥80%**Recommended working concentration**: 0.5-500 µg/ml incubation buffer
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Background Information
The polymer MAB33 IgG1/Fab1 Poly incorporates elements comparable with those of MAB33 IgG1/IgG1 Poly,and also covers interferences against Fab neo-epitopes.

Literature
1) E. Mössner, H. Lenz, G. Bienhaus, Poster: AACC/IFCC (1990)
2) E. Mössner, H. Lenz, G. Bienhaus, Clin. Chem. ***36***, 1093 (1990)
3) R. Valdes, J. Clin. Imm. ***15/2***, 87 (1992)
4) H. Vaidya, Clin. Chem. ***38/9***, 1737 (1992)
5) St. Avrameas, Mol. Imm. ***30/12***, 1133 (1993)
6) E. Wilkinson, Clin. Chem. ***39/10***, 2166 (1993)
7) L.J. Kricka, Clin. Chem of Acta **215**, 153 (1993)
8) H.J. Hansen, J. Clin. Imm. ***16/4***, 294 (1993)
9) M. Kuroki, J. Imm. Meth. ***180***, 81 (1995)
10) R. Sapin, Clin. Chem. ***41/1***, 117 (1995)
11) H. Schlebusch et al., Hybridoma ***14***, 167, 74 (1995)
12) P. Mikrosch, Eur. J. Chem. Biochem. ***35/11***, 881 (1997)
13) U. Hasholzner, Anticancer Research, ***17***, 3055 (1997)
14) St. Levison, J. Clin. Ligand Assay ***20/2***, 180 (1997)
15) L.J. Kricka, Clin. Chem. ***45/7***, 942 (1999)
16) Roche Applied Science, Interference-Eliminating Proteins for the Diagnostics Industry, 7 ed., July 2009

Cat. No.	Pack Size
11 368 338 103	5, 50, 250 mg

Will be supplied as "MAB-IgG/Fab (Polymer), SQ Poly MAB 33".
Unit of Measure is "g active ingredient".
For further processing only.

MAB33 IgG1/IgG1 Poly
frozen solution

Part of the modular MAB33 family toolbox for highly specific interference elimination.

Application
Use the polymer MAB33 IgG1/IgG1 Poly for formulations employing intact IgG1.MAB33 IgG1/IgG1 Poly is more efficient for polymeric and less specific types of interference (compared to monoclonal MAB 33 IgG1).

Benefits
- Eliminate exclusively interference to produce improved assay performance.
- Increase the assay sensitivity and accuracy.
- Profit from higher precision, greater accuracy and optimized handling convenience.

Product Description
Immunogen: h CK-MM
Spleen donor: Mouse Balb/c
Antibody class: IgG1
Preparation: Lyophilized from a solution containing potassium phosphate and NaCl and 6%sucrose. No further preservatives are added.

Properties
Molecular structure: Molecular structure: IgG1, polymerized with IgG1; defined molecular range distribution
Remarks: Cannot be used in test systems for determination of CK-MM and CK-MB.

Specification
Appearance: Frozen liquid
Solubility: Yellowish clear to slightly opalescent solution, containing K-phosphate, NaCl and 4% sucrose , pH 7,5
Protein (Biuret): ≥30 mg protein/mg lyophilizate
Purity (HPLC): ≥90 area% IgG of total protein
Functional activity (relative titer based on master lot determined by MTP assay): ≥80 %
Recommended working concentration: 0.5-500 µg/ml incubation buffer
pH 5.5 treatment (60 minutes): Corresponds to specification
Turbidity properties δA_{334}: Corresponds to specification
Bioburden: ≤250 CFU/ml
Stability: At -60 to -90°C within specification range for 24 months. Avoid repeated freezing and thawing.

Background Information
MAB33 IgG1/IgG1 Poly is the polymerized chemical version of MAB33 IgG1.

Literature
1) E. Mössner, H. Lenz, G. Bienhaus, Poster: AACC/IFCC (1990)
2) E. Mössner, H. Lenz, G. Bienhaus, Clin. Chem. ***36***, 1093 (1990)
3) R. Valdes, J. Clin. Imm. ***15/2***, 87 (1992)
4) H. Vaidya, Clin. Chem. ***38/9***, 1737 (1992)
5) St. Avrameas, Mol. Imm. ***30/12***, 1133 (1993)
6) E. Wilkinson, Clin. Chem. ***39/10***, 2166 (1993)
7) L.J. Kricka, Clin. Chem of Acta **215**, 153 (1993)
8) H.J. Hansen, J. Clin. Imm. ***16/4***, 294 (1993)
9) M. Kuroki, J. Imm. Meth. ***180***, 81 (1995)
10) R. Sapin, Clin. Chem. ***41/1***, 117 (1995)
11) H. Schlebusch et al., Hybridoma ***14***, 167, 74 (1995)
12) P. Mikrosch, Eur. J. Chem. Biochem. ***35/11***, 881 (1997)

Cat. No.	Pack Size
11 939 661 103	5, 50, 250, 1000 mg

Will be supplied as "MAB-33-IgG-Polymer *SQ". Unit of Measure is "g active ingredient".
For further processing only.

Bovine IgG (PAB<->R-IgG)
lyophilizate

Cat. No.	Pack Size
11 293 621 103	custom fill

Will be supplied as "PAB<->R-IgG(DE) Bovine IgG". Unit of Measure is "g active ingredient".

DRY ICE

For further processing only.

Part of the product portfolio for nonspecific interference elimination.

Application
Use Bovine IgG to reduce nonspecific adsorption of antibodies to the solid phase and other cross-reactive, nonspecific antibody interactions.

Benefits
- Block the nonspecific linkage of test components to the solid phase.
- Minimize background signals.
- Improve assay sensitivity and dynamics.

Product Description
The polyclonal antibody Bovine IgG is lyophilized from a solution containing potassium phosphate and sodium chloride. No preservatives are added. IgG fraction is produced in bovine, purified by anion-exchange chromatography.

Properties
Recommended working concentration: 0.5-2.5 mg/ml

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in NaCl, 0.9% (c=10 mg/ml)
Turbidimetric measurement (A_{546}, against water): ≤100 mE
Protein (Biuret): ≥0.8 mg/mg lyophilizate
Aggregated IgG (HPLC / TSK3000): ≤5%
Country of origin: USA or NZL
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Bovine Serum Albumin I
lyophilizate

Cat. No.	Pack Size
11 726 536 103	custom fill

Will be supplied as "Albumin RPLA 1 Assay Quality". Unit of Measure is "kg".
Additional products: BPLA Type IV, Catalog No. 11726544103; BPLA Type IV, new, with minimized content of proteases, is available for sampling under Catalog No. 03535240103.
For further processing only.

Part of the product portfolio for nonspecific interference elimination.

Application
Use BPLA Type I to reduce non-specific adsorption to the solid phase or to saturate unoccupied binding sites. It is recommended for assays with higher demands on sensitivity (*e.g.,* thyroid, tumor markers).

Benefits
- Rely on the premium quality for blocking the non-specific linkage of test components to the solid phase.
- Minimize background signals.
- Improve assay sensitivity and dynamics.
- Profit from a higher purity grade with low levels of steroids, haptens and lipids than BSA V.

Product Description
BPLA Type I is lyophilized from a solution containing potassium phosphate and sodium chloride. No preservatives are added.

Specification
Appearance: Yellowish lyophilizate
Solubility: Clear to slightly turbid yellowish solution in water (c=60 mg/ml)
A_{405} (against water): ≤0.250
pH value: 6.5-7.5
Protein (from N, according to Dumas, factor 6.25): ≥95%

Purity (HPLC / TSK 3000): ≥95% (monomer)
Water (K. Fischer): ≤5%
Bioburden: ≤50 CFU/g
Ca: ≤0.1%
Fe: ≤0.005%
Cu: ≤0.002%
Complexing agent:
Recovery of Fe: 100±20%
Recovery of Cu: 100 ± 20%
Heavy metals (as Pb): ≤0.002%
P_i: ≤0.005%
Octanoic acid (GC): ≤0.5%
Analysis of T3, T4, Estradiol, Testosterone, Progesterone (for information only): Values stated on certificate of analysis.
Country of origin: USA
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Bovine Serum Albumin IV
lyophilizate

Cat. No.	Pack Size
11 726 544 103	custom fill

Will be supplied as "Albumin RPLA 4 Assay Quality". Unit of Measure is "kg".
For further processing only.

Part of the product portfolio for nonspecific interference elimination.

Application
Use BPLA Type IV to reduce non-specific adsorption to the solid phase or to saturate unoccupied binding sites. BPLA Type IV represents a very high purity grade (≥ 95%) and is recommended for assays with higher demands on sensitivity (*e.g.,* thyroid, tumor markers).

Benefits
- Rely on the premium quality for blocking the non-specific linkage of test components to the solid phase.
- Minimize background signals.
- Improve assay sensitivity and dynamics.

Product Description
BPLA Type IV is lyophilized from a solution containing potassium phosphate and sodium chloride. No preservatives are added.

Specification
Appearance: Yellowish lyophilizate
Solubility: Clear to slightly turbid yellowish solution in water (c=60 mg/ml)
A_{405} (against water): ≤0.200
pH value: 6.5-7.5
Protein (from N, according to Dumas, factor 6.25): ≥95%
Purity (HPLC / TSK 3000): ≥95% (monomer)
Water (K. Fischer): ≤5%
Bioburden: ≤50 CFU/g
Ca: ≤0.1%
Fe: ≤0.005%
Cu: ≤0.002%
pH 4.5 treatment (up to 3 hours): Corresponds to specification
Country of origin: USA, NZL
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Poly BSA Type I
frozen solution

Part of the product portfolio for nonspecific interference elimination.

Application
Use Polymeric BSA Type I for the elimination of nonspecific interferences.

Benefits
- Rely on the premium quality for effective elimination of multivalent interferences (*e.g.,* polyvalent antibodies/conjugates or antigens) in infectious disease assays and tumor marker tests.

Product Description
Poly BSA Type I is produced from bovine serum albumine (BSA) by polymerization. Its surface is chemically modified by acetylation, and the negative charge of the Poly BSA Type I eliminates hydrophobic interactions. The Poly BSA Type I solution contains protein, potassium-phosphate buffer and preservatives (chloroacetamide, methylisothiazolone and sucrose).

Properties
Recommended working concentration: 0.1-20 mg/ml incubation buffer.

Specification
Appearance: Yellowish, clear to slightly opalescent solution (frozen)
pH value (+25°C): 6.8-7.2
Protein (Biuret): ≥40 mg/ml
Particle size (Photon correlations spectrometry): 15-45 nm
Country of origin: USA, NZL
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Cat. No.	Pack Size
11 866 737 103	1, 5, 20 g

Will be supplied as "Poly BSA Type I *SQ". Unit of Measure is "g active ingedient".

DRY ICE

For further processing only.

Poly BSA Type II
frozen solution

Part of the product portfolio for nonspecific interference elimination.

Application
Use Polymeric BSA Type II for the elimination of nonspecific interferences.

Benefits
- Rely on the premium quality for effective elimination of multivalent interferences (*e.g.,* polyvalent antibodies/conjugates or antigens) in infectious disease assays and tumor marker tests.

Product Description
Poly BSA Type II is produced from bovine serum albumine (BSA) by polymerization. Its surface is chemically modified by succinylation, and the negative charge of the Poly BSA Type II eliminates hydrophobic interactions.The Poly BSA Type II solution contains protein, potassium-phosphate buffer, and preservatives (chloroacetamide, methylisothiazolone and sucrose).

Properties
Recommended working concentration: 0.1-20 mg/ml incubation buffer

Specification
Appearance: Yellowish, clear to slightly opalescent solution (frozen)
pH value (+25°C): 6.8-7.2
Protein (Biuret): ≥40 mg/ml

Cat. No.	Pack Size
11 816 438 103	1, 5, 20 g

Will be supplied as "poly BSA Type II *SQ". Unit of Measure is "g active ingredient".

DRY ICE

For further processing only.

Particle size (Photon correlations spectrometry): 25-55 nm
Country of origin: USA, NZL
pH 5.5 treatment (30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months. Avoid repeated freezing and thawing.

Rabbit IgG (PAB<->K-IgG)
lyophilizate

Cat. No.	Pack Size
10 912 280 103	custom fill

Will be supplied as "PAB<->K-IgG(DE-FF)". Unit of Measure is "g active ingredient".
For further processing only.

Part of the product portfolio for nonspecific interference elimination.

Application
Use Rabbit IgG to reduce the nonspecific antibody interference in assays using rabbit antibodies.

Benefits
- Block the non specific linkage of test components to the solid phase.
- Minimize background signals.
- Improve assay sensitivity and dynamics.

Product Description
The polyclonal antibody Rabbit IgG is lyophilized from a solution containing potassium phosphate and sodium chloride. No preservative are added. IgG fraction is produced in rabbit, purified by anion-exchange chromatography.

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl 0.9% (c=10mg/ml)
Protein (Biuret) : ≥0,7 mg/mg lyophilizate
Purity (HPLC / TSK 3000): Corresponds to specification (in comparison to master lot)
Stability: At -15 to -25°C within specification range for 36 months. Avoid repeated freezing and thawing.

Sheep IgG (PAB<->S-IgG)
lyophilizate

Cat. No.	Pack Size
10 717 606 103	custom fill

Will be supplied as "PAB<->S-IgG". Unit of Measure is "g".
For further processing only.

Part of the product portfolio for nonspecific interference elimination.

Application
Use Sheep IgG to reduce the nonspecific antibody interference in assays using sheep antibodies.

Benefits
- Block the nonspecific linkage of test components to the solid phase.
- Minimize background signals.
- Improve assay sensitivity and dynamics.

Product Description
The polyclonal antibody Sheep IgG is lyophilized from a solution containing potassium phosphate and sodium chloride. No preservatives are added. IgG fraction is produced in sheep, purified by anion-exchange chromatography.

Properties
Recommended working concentration: 0.5-1.5 mg/ml

Specification
Appearance: White lyophilizate
Solubility: Clear to slightly opalescent solution in NaCl, 0.9% (c= 5 mg/ml)

Turbidimetric measurement (A_{546}, against water): ≤100 mE Protein (Biuret):
0.8 mg/mg lyophilizate
Aggregated IgG (HPLC / TSK3000): ≤10%
Stability: At -15 to -25°C within specification range for 24 months.

Alkaline Phosphatase Mutein, recombinant
from calf intestine, expressed in *Pichia pastoris*, lyophilizate

Cat. No.	Pack Size
04 781 007 103	custom fill

Will be supplied as "AP-Mutein, rec.". Unit of Measure is "g".
For further processing only.

Part of marker enzyme portfolio

Application
Use Alkaline Phosphatase Mutein (AP Mutein) to eliminate human serum derived AP directed assay interferences.

Benefits
- Rely on the special design for reducing alkaline phosphatase-related assay interference interactions.

Product Description
In addition to the AP Mutein, recombinant the lyophilizate contains a mixture of proteins from the *Pichia* system supporting the interference elimination. AP Mutein is lyophilized from a solution containing in NaCl, 0.2 mol/l; $ZnCl_2$, 0.1 mmol/l; Tea, 30 mmol/l; $MgCl_2$, 1 mmol/l; raffinose, 50% (w/v); pH approximately 7.6. Production is done according to the procedures of the active enzyme.

EC 3.1.3.1

Specification
Appearance: White to yellowish lyophilizate
Solubility: Clear to light yellowish solution in 50% glycerol solution (c=10 mg/ml)
pH value: 7.0-8.0
Protein (A_{280}, 1 mg/ml=1, against water): ≥0.2 mg protein/mg lyophilizate
Specific activity (+37°C, pNPP): ≤10 U/mg protein
SDS-gel (qualitative comparison of the gel bands in reference to the bands of a standard): Corresponds to specification
Stability: At +2 to +8°C within specification range for 24 months.

Background Information
Alkaline Phosphatase Mutein (AP Mutein), recombinant, is the inactive form of recombinant highly active AP, expressed in *Pichia pastoris*. The inactivation of AP Mutein is based on one single point mutation located in the active site of the alkaline phosphatase.

Alkaline Phosphatase, EIA Grade
from calf intestine, solution

Cat. No.	Pack Size
10 556 602 103	custom fill

Will be supplied as "Phosphatase, Alkaline, Calf Intestine". Unit of Measure is "g".
For further processing only.

Part of marker enzyme portfolio

Application
Marker enzyme for preparing antibody- / antigen-enzyme conjugates incorporated in immunoassay reagents for colorimetric, fluorimetric and luminometric detection.

Benefits
- Synthesize stable and reproducible Alkaline Phosphatase (AP) conjugates with AP, sourced from NZL intestines, that serves as a reliable origin.

EC 3.1.3.1

Properties
Nomenclature: Orthophosphoric-monoester phosphohydrolase (alkaline

optimum)
Molecular weight: ≥57 kD
Inhibitors: P_i, metal chelating agents, divalent heavy metal ions (*e.g.*, Be^{2+}, Zn^{2+}), many amino acids (*e.g.,* L-phenylalanine, L-tryptophan, L-cysteine), iodosobenzoate, iodoacet-amide.
Activators: Mg^{2+}, Co^{2+}, Mn^{2+}
pH optimum: 9.8
pH stability: 8.0
Thermal stability: Up to +40°C

Specification
Appearance: Clear, colourless solution in NaCl, 3 mol/l; $MgCl_2$, 1 mmol/l; $ZnCl_2$, 0.1 mmol/l; Tea, 30 mmol/l
pH value: 7.0-8.0
Protein (A_{280}, 1 mg/ml=1, against water): ≥10 mg/ml
Specific activity (+37°C, pNPP): ≥3000 U/mg
Alkaline Phosphatase (HPLC): ≥95 area% (HPLC profile added to certificate)
Amino groups: 8-16 mol/mol
Carbohydrates, n=2: No limit
pH 5.5 treatment (30 minutes): Corresponds to specification
Origin of bovine intestine: NZL
Stability: At +2 to +8°C within specification range for 15 months.

Background Information
Alkaline phosphatase catalyzes the hydrolysis of numerous phosphate esters, such as esters of primary and secondary alcohols, sugar alcohols, cyclic alcohols, phenols and amines. Phosphodiesters do not react with Alkaline Phosphatase, EIA Grade. The enzyme hydrolyzes PP_i. The kinetic properties of the enzyme depend on many factors, such as purity of enzyme, concentration of enzyme in the assay, buffer, pH etc.

Literature
1) A.P. Schaap, H. Akhavan, L.J. Romano, Clin. Chem. ***35***, No. 9 1863–1864 (1989)
2) M.S. Urdea, J. Kolberg, J. Clyne, J.A. Running, D. Besemer, B. Warner, R. Sanchez-Pescader, Clin. Chem. ***35***, No. 8, 1571–1575 (1989)
3) E. Jablonski, E.W. Moomaw, R.H. Tullis, J.L. Ruth, Nucleic Acids Res. ***14***, 6115–28 (1986)
4) D.G. Williams, J. of Immunological Methods ***72***, 261–268 (1984)
5) Roche Applied Science, Alkaline Phosphatase, 4. ed., 2007.

Alkaline Phosphatase, recombinant, highly active
from calf intestine, expressed in *Pichia pastoris*, solution

Part of marker enzyme portfolio

Cat. No.	Pack Size
03 137 031 103	custom fill

Will be supplied as "AP, Yeast, high act., rec., EIA, NaCl". Unit of Measure is "g".
For further processing only.

Application
Marker enzyme for preparation of antibody- / antigen-enzyme conjugates incorporated in highly sensitive immunoassay reagents for colorimetric, fluorimetric and luminometric detection. Alkaline Phosphatase is recommended for conjugation via carbohydrate groups (content approximately 30%).

Benefits
- Rely on exellent superior product quality of Alkaline Phosphatase (AP) recombinant, highly active.
- Synthesize stable, highly active and reproducible AP conjugates.
- Eliminate the risk of BSE contamination: No animal-derived components are used in the production process.

EC 3.1.3.1

Properties
IEP (IEF, CE): 3.6-4.7
MALDI-TOF MS:
Total molecular weight: 124±0 kD
Molecular weight protein: 104 kD (=84%)
Molecular weight carbohydrate: 20±10 kD (16±6%)
Accessible N-glycosylation sites: 2/subunit
Branching type: Higher branched type (hybrid type) GlcNAc, Mannose, no NeuAc detected
O-glycosylation sites: Not detected
Number of isoenzymes:
present: 3 (MS)
based on protein: 1 (MS)

Specification
Appearance: Clear, colorless solution in NaCl, 3 mol/l; $MgCl_2$, 5 mmol/l; $ZnCl_2$, 0.1 mmol/l; Tea, 30 mmol/l, pH approximately 7.6
pH value: 7.0-8.0
Protein (A_{280}, 1 mg/ml=1, against water): ≥20 mg/ml
Specific activity (+37°C, pNPP): ≥7000 U/mg
Alkaline Phosphatase (HPLC): ≥95% (HPLC profile added to certificate)
Amino groups: 5-13 mol/mol
Carbohydrates, n=2: No limit
Stability: At +2 to +8°C within specification range for 12 months.

Background Information
Alkaline Phosphatase recombinant, highly active catalyzes the hydrolysis of numerous phosphate esters, such as esters of primary and secondary alcohols, sugar alcohols, cyclic alcohols, phenols and amines. Phosphodiesters do not react with Alkaline Phosphatase, recombinant. The enzyme hydrolyzes PP_i. The kinetic properties of the enzyme depend on many factors, such as purity of enzyme, concentration of enzyme in the assay, buffer, pH etc.

Literature
1) Th. Manes, M.F. Hoylaerts, R. Mueller, F. Lottspeich, W. Hoelke, J.L. Millán, Genetic Complexity, Structure and Characterisation of Highly Active Bovine Intestinal Alkaline Phosphatases, JBC, ***273***, 36, 23353–23360 (1998)
2) R.K. Bretthauer, F.J. Castellino, Glycosylation of Pichia Pastoris derived Proteins, Biotechnol. Appl. Biochem. ***30***, 193–200 (1999)
3) I. Ceveghino, I. Gregg, Heterologous Protein Expression in the Methylotropic Yeast Pichia Pastoris, FEMS Microbiology Reviews ***24***, 45–66 (2000)
4) G. Gellissen, Heterologous Protein Production in Methylotropic Yeasts, Appl. Microbiol. Biotechnol. ***54***, 741- 50 (2000)
5) Roche Applied Science, Alkaline Phosphatase, 4. ed., 2007.

Alkaline Phosphatase, recombinant, highly active, carbohydrate reduced
from calf intestine, expressed in *Pichia pastoris*, solution

Part of marker enzyme portfolio

Cat. No.	Pack Size
03 535 452 103	custom fill

Will be supplied as "AP,highly active, recombinant, CR". Unit of Measure is "g".
For further processing only.

Application
Marker enzyme for preparation of antibody- / antigen- enzyme conjugates incorporated in highly sensitive immunoassay reagents for colorimetric, fluorimetric and luminometric detection. Recommended for conjugation via amino groups.

Benefits
- Rely on exellent product quality of Alkaline Phosphatase (AP) recombinant, highly active.

- Synthesize stable, highly reactive, reproducible AP conjugates.
- Eliminate the risk of BSE contamination: No animal-derived components are used in the production process.

EC 3.1.3.1

Properties

IEP (IEF, CE): 5.2-6.0
MALDI-TOF MS:
Total molecular weight: 111 kD
Molecular weight protein: 104 kD (= 94%)
Molecular weight carbohydrates: 6.5 kD (= 6%)
Accessible N-glycosylation sites: 2/subunit
Branching type: Reduced branched type GlcNAc, Mannose no NeuAc detected
O-glycosylation sites: Not detected
Number of isoenzymes:
present: 1 (MS)
based on protein: 1 (MS)

Specification

Appearance: Clear, colourless solution in NaCl, 3 mol/l; $MgCl_2$, 5 mmol/l; $ZnCl_2$, 0.1 mmol/l; Tea, 30 mmol/l, pH approximately 7.6
pH value: 7.0-8.0
Protein (A_{280}; 1 mg/ml=1; against water): ≥20±1 mg/ml
Specific activity (+37°C, pNPP): ≥ 7,000 U/mg
Alkaline Phosphatase (HPLC): ≥95 area% (HPLC profile added to certificate)
Amino groups: 5-13 mol/mol
Carbohydrates, n=2: ≤7%
Stability: At +2 to +8°C within specification range for 12 months.

Background Information

AP recombinant, highly active CR catalyzes the hydrolysis of numerous phosphate esters, such as esters of primary and secondary alcohols, sugar alcohols, cyclic alcohols, phenols and amines. Phosphodiesters do not react with Alkaline Phosphatase, recombinant. The enzyme hydrolyzes PP_i. The kinetic properties of the enzyme depend on many factors, such as purity of enzyme, concentration of enzyme in the assay, buffer, pH and others. The product contains a significantly reduced carbohydrate moiety.

β-Galactosidase
from *E. coli*, lyophilizate

Cat. No.	Pack Size
11 291 963 103	custom fill

Will be supplied as "b-Galactosidase, Lyo.". Unit of Measure is "MU".
For further processing only.

Part of marker enzyme portfolio

Application

Marker enzyme for the manufacturing of antibody- and antigen-enzyme conjugates incorporated in immunoassays for colorimetric and fluorimetric detection.

Benefits

- Use ß-Galactosidase as a reliable source for hydrolysis of ß-Gal conjugates.

EC 3.2.1.23

Properties

Nomenclature: β-D-galactohydrolase
Molecular weight (by sequence): 465 kD
Structure: 4 identical subunits; β-galactosidase contains no carbohydrates

Specification

Appearance: White lyophilizate
pH value (c=10 mg/ml, in water): 7.0-8.0
Protein (Biuret): 0.25-0.5 mg/mg lyophilizate
Activity (+37°C, 2-NP-β-D-galactoside): ≥120 U/mg lyophilizate
Specific activity (+37°C, 2-nitrophenyl-β-D-galactopyranoside): ≥300 U/mg protein
Contaminants (expressed as percentage of β-Galactosidase activity):
β-Fructosidase: ≤0.001
α-Galactosidase: ≤0.001
Glucose-DH: <0.001
α-Glucosidase: ≤0.001
"NADH oxidase": ≤0.001
Na (flame photometric): ≤2500 ppm
Stability: At +2 to +8°C: within specification range for 12 months. Store dry.

Background Information

β-Galactosidase hydrolyzes ß-D-galactosides.

β-Galactosidase Mutein

from *E. coli* overproducer, lyophilizate

Cat. No.	Pack Size
11 184 024 103	custom fill

Will be supplied as "b-Galactosidase Mutein". Unit of Measure is "mg active ingredient".

DRY ICE

For further processing only.

Part of marker enzyme portfolio

Application

Use β-Galactosidase Mutein to eliminate ß-galactosidase directed interferences in immunoassays derived from human sera.

Benefits

- **Eliminate the interference activity of ß-galactosidase directed antibodies**: ß-Galactose Mutein reacts with ß-galactosidase directed antibodies in the same way as the active ß-galactosidase.

EC 3.2.1.23

Properties

ß-Galactosidase Mutein is identical to native ß-galactosidase with respect to immuno-reactivity, conjugation, properties, surface charge, hydrophobicity, molecular weight, production procedure and down stream processing.

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless to slightly opalescent solution in water (c=20 mg/ml)
Protein (Biuret): 0.15-0.30 mg/mg lyophilizate
Specific activity (10 mg/ml, +37°C, 2-nitrophenyl-β-D-galactopyranoside): ≤0.2 U/mg protein
Aggregated β-Galactose Mutein (HPLC / TSK 4000): ≤10%
Immunoreactivity (based on ML): 80-120%
Stability: At -15 to -25°C within specification range for 24 months.

Background Information

ß-Galactose Mutein from *E.coli* is constructed using site-directed mutagenesis of single amino acids in the active site.

Literature

1) T. Kohno et al., J. Anal. ***5***, 197 – 205 (1991)
2) E. Ishikawa et al., Scand. J. Immunol. ***8*** (Suppl. 7), 43 – 55 (1978)
3) M. Imagawa et al., J. Biochem. ***960***, 1727 – 1735 (1983)
4) R. Armenta et al., Analytical. Biochemistry ***146***, 211 – 219 (1985)

β-Galactosidase, recombinant, EIA Grade
from *E. coli* overproducer, lyophilizate

Part of marker enzyme portfolio

Application
Marker enzyme for the manufacturing of antibody- and antigen-enzyme conjugates incorporated in immunoassays for colorimetric and fluorimetric detection.

Benefits
- Synthezise stable, highly active and reproducible ß-Gal antigen and antibody conjugates.
- Eliminate the risk of BSE contamination: No animal-derived components are used in the production process.

EC 3.2.1.23

Properties
Nomenclature: β-D-galactohydrolase
Molecular weight (by sequence): 465 kD
Structure: 4 identical subunits, β-galactosidase contains no carbohydrates
Isoelectric point: 4.61
Michaelis constants:
Tris buffer, pH 7.6, +20°C / relation rate:
2-nitrophenyl-β-galactoside: 9.50 x 10^{-4} mol/l / 1.00
phenyl-β-D-galactoside: 3.23 x 10^{-3} mol/l / 0.05
lactose: 3.85 x 10^{-2} mol/l / 0.06
4-nitrophenyl-β-galactoside: 4.45 x 10^{-4} mol/l / ~0.50
Activators: Mg^{2+} and Na^{+} (or other monovalent cations) are essential for activity.
pH optimum: 8.0
pH stability: 6.0
Thermal stability: Up to +37°C
Thiol groups: 64 SH groups, approximately 16 of these are accessible for SH-reactive reagents. 4 of these (Cys 76) take part in conjugation.

Specification
Appearance: White lyophilizate, stabilized with phosphate buffer and sucrose
Solubility: Clear, colorless solution in water (c=20 mg/ml)
Protein (Biuret): Approximatly 0.25 mg/mg lyophilizate
Specific activity (+37°C, 2-nitrophenyl-β-D-galactopyranoside): ≥700 U/mg protein
SH-groups, free (after dialysis): ≥12 moles/mole enzyme (corresponds to 465 000 g)
Aggregated β-galactosidase (HPLC): ≤3% (dimer-part with a molar mass of 0.93 x 10^{6} D)
Stability: At -15 to -25°C within specification range for 24 months. Store under nitrogen.

Background Information
β-Galactosidase hydrolyzes ß-D-galactosides. Although the enzyme activity with 2-nitrophenyl-β-D-galactoside as substrate is higher than with the 4-isomer, the enzyme reaction with the 4-compound is more sensitive due to a higher absorption coefficient for 4-nitrophenol, ε_{405}: 18.5 [$mmol^{-1}$ x l x cm^{-1}].

Cat. No.	Pack Size
10 570 079 103	custom fill

Will be supplied as "b-Galactosidase, Escherichia coli". Unit of Measure is "g active ingedient".

DRY ICE

For further processing only.

Peroxidase (POD), EIA Grade
from horseradish, lyophilizate

Cat. No.	Pack Size
10 815 462 103	custom fill

Will be supplied as "Peroxidase (POD) from Horse-radish". Unit of Measure is "g".

For further processing only.

Part of marker enzyme portfolio

Application
Peroxidase (POD), EIA Grade is a marker enzyme enabling peroxidation of reduced dyes in the indicator reaction producing a color, fluorimetric or luminescent derivative of the labeled molecule for further detection and quantification.

Benefits
- Synthesize stable and reproducible antibody- and antigen-conjugates incorporated in enzyme immuno assays (EIA) representing outstanding homogeneity with respect to isoenzyme C distribution.

EC 1.11.1.7

Properties
Horseradish peroxidase is a 44,173.9 D glycoprotein with 4 lysine residue.

Specification
Appearance: Red-brown lyophilizate
Activity (+25°C, guaiacol, H_2O_2) : ≥225 U/mg lyophilizate
Specific Activity (+25°C, ABTS, H_2O_2, pH 5.0): ≥900 U/mg lyophilizate
Purity number (A_{403}/A_{275}): 3.0-3.5
A_{403} (0.2 mg/ml; against buffer): No limit
Contaminants (expressed as percentage of Peroxidase activity):
ATPase: ≤0.001
Catalase: ≤0.7
Phosphatase, acidic: ≤0.001
Isoenzyme distribution (HPLC): ≥90% (homogeneous with respect to isoenzyme C)
Amino groups: 2-3 moles/mole enzyme
Carbohydrates: 12.0-14.5% (w/w)
Stability: At -15 to -25°C within specification range for 24 months. Keep tightly sealed.

Literature
1) R. Presentini, B. Terrana, J. of Immunoassay ***16*** (3), 309 (1995)
2) P. Tijssen, E. Kurstak, Analytical Biochemistry ***136***, 451 (1984)

Peroxidase (POD), Grade I
from horseradish, lyophilizate

Cat. No.	Pack Size
10 121 606 103	custom fill

Will be supplied as "Peroxidase (POD), Grade I, Horse-radish". Unit of Measure is "MU".
For further processing only.

Part of marker enzyme portfolio

Application
Peroxidase (POD), Grade I is a marker enzyme enabling peroxidation of reduced dyes in the indicator reaction producing a color, fluorimetric or luminescent derivative of the labeled molecule for further detection and quantification.

EC 1.11.1.7

Properties
Horseradish peroxidase is a 44,173.9 D glycoprotein with 4 lysine residue.

Specification
Appearance: Red-brown lyophilizate
Solubility: Clear, red-brown solution in water (c=10 mg/ml)
pH value (c=10 mg/ml): 6.0-7.0

Activity (+25°C, guaiacol, H_2O_2): ≥250 U/mg lyophilizate
Purity number (A_{403}/A_{275}): 3.0-3.5
Contaminants (expressed as percentage of Peroxidase activity):
ATPase: ≤0.001
Catalase: ≤0.7
Phosphatase, acidic: ≤0.001
Stability: At +2 to +8 within specification range for 24 months. Keep tightly sealed.

Poly Peroxidase (Poly POD), EIA Grade
from horseradish, lyophilizate

Part of marker enzyme portfolio

Cat. No.	Pack Size
11 578 545 103	custom fill

Will be supplied as "Peroxidase, Polymerized (MH)". Unit of Measure is "mg active ingredient".

DRY ICE

For further processing only.

Application
Poly Peroxidase (Poly POD) is a marker enzyme enabling peroxidation of reduced dyes in the indicator reaction producing a color, fluorimetric or luminescent derivative of the labeled molecule for further detection and quantification.

Benefits
- Enhance ELISA sensitivity by using Polymeric Peroxidase (Poly POD).

Product Description
Poly Peroxidase is lyophilized in 10 mmol/l potassium phosphate, 50 mmol/l NaCl, 1 mmol/l EDTA, pH 6.1and saccharose as stabilizer.

EC 1.11.1.7

Properties
Molecular weight: 0.8 ± 0.2 x 10^6 D (~ 20 POD-monomers)
Activation: Is accomplished by MHS (Maleimidohexanoyl-N-hydroxysuccinimide ester) ≥40 MH-groups per Poly POD (MH) are accessible for conjugation with sulfhydryl groups.

Specification
Appearance: Red-brown lyophilizate
Solubility: Clear, red-brown solution in water (c= 5 mg/ml)
Specific activity (+25°C, ABTS): ≥600 U/mg
MH-groups: ≥2 (mol MH/mol POD)
Stability: At -60 to -90°C within specification range for 48 months.

Chlorophenolred-β-D-galactopyranoside (CPRG)
sodium salt, powder

Cat. No.	Pack Size
11 379 119 001	custom fill

Will be supplied as "Chlorophenolred-ss-D-galactopyranoside". Unit of Measure is "g".

DRY ICE

For further processing only.

Substrate for marker enzyme

Application
Use CRPG as a substrate for β-Galactosidase.

CAS: 99792-79-7

Properties
Formula: $C_{25}H_{21}O_{10}Cl_2SNa$
Molecular weight: 607.4 D

Specification
Appearance: Orange-red powder
Solubility: Clear, red colored solution in water (c=20 mg/ml)
CPRG (A_{405}, ε=22.57 l x $mmol^{-1}$ x cm^{-1}): 80-110%
CPRG (HPLC): ≥97.5%
Na (AA): 3-4%
Water (K. Fischer): ≤15%
Chlorophenolred, free (from A_{578}): ≤0.1%
Galactose, free (emzymatically) : ≤5.0%
A_{578} (c=5 mmol/l water) : ≤0.200
A_{650} (c=5 mmol/l water; turbidity): ≤0.030
Thin layer chromatography: Corresponds to reference
Reaction rate (β-galactosidase) of sample/2-NP-galactoside: ≥8.5%
Stability: At -15 to -25°C within specification range for 24 months. Store dry. Keep tightly closed. Ship in dry ice containers.

Literature
1) B. Porstmann, T. Porstmann in T.T. Ngo: Nonisotopic Immunoassay, Plenum Press, N.Y. (1988)
2) J. Backhaus, H. Buschek, R. Machat, M. Kuhr, W.F. Weckerle, Chromogenic Substrates for ß-D-galactosidase, 4th European Carbohydrate Symposium (July 12 –17, 1987)

2,2'-azino-bis(3-ethylbenzthiazoline) 6-sulphonic acid (ABTS)
solution

Cat. No.	Pack Size
11 668 234 103	custom fill

Will be supplied as "ABTS Bulk solution". Unit of Measure is "l". For further processing only.

Substrate for marker enzyme

Application
Use ABTS as substrate solution for horse radish peroxidase (405nm).

CAS: 30931-67-0

Specification
Appearance: Slightly green solution
UV spectrum (280-450 nm): Maximum at 342±4 nm; 500±50 mE
Extinction (A_{405}, 1 cm, against water): ≤60 mE
Content of ABTS: ≥0.3 g/l
Content of hydrogen peroxide:≥0.01%
Function ELISA: Corresponds to specification
Stability: At +2 to +8°C within specification range for 30 months.

BM Blue POD Substrate, soluble
3,3'-5,5'-Tetramethylbenzidine (TMB), solution

Cat. No.	Pack Size
11 432 559 103	custom fill

Will be supplied as "BM blue POD Substrate, Soluble". Unit of Measure is "l".

For further processing only.

Substrate for marker enzyme

Application
Use BM Blue POD Substrate as substrate solution for horse radish peroxidase.

CAS: 54827-17-7

Specification
Appearance of solution: Clear, slightly yellowish
Performance test according to TM (function test): Corresponds to specification
Stability: At +2°C to 8°C within specification range for 18 months.

3,3',5,5'-Tetramethylbenzidine (TMB)
crystalline powder

Cat. No.	Pack Size
10 203 700 103	custom fill

Will be supplied as "3,3'5,5'-Tetramethylbenzidine". Unit of Measure is "kg".
For further processing only.

Substrate for marker enzyme

Application
Use TMB as substrate solution for horse radish peroxidase (450nm).

CAS: 54827-17-7

Properties
Formula: $C_{16}H_{20}N_2$
Molecular weight: 240.35 D

Specification
Appearance: Yellowish to light brown crystalline powder
Melting range: +168 to +171°C
TMB (GC): ≥99.5 area%
TMB (titrimetric, based on dry weight): ≥97.5%
Loss on drying (for 2 hours at +105°C): ≤1%
Stability: At +2 to +8°C within specification range for 24 months. Protect from light.

4-Aminophenyl Phosphate (pAPP)
disodium salt, powder

Cat. No.	Pack Size
05 642 965 103	custom fill

Will be supplied as "4-Aminophenyl Phosphate Disodium Salt". Unit of Measure is "kg".
For further processing only.

Substrate for marker enzyme

Application
Use 4-Aminophenyl Phosphate (pAPP), Disodium Salt as substrate for alkaline phosphatase.

CAS: 75966-16-4

Properties
Formula: $C_6H_6NO_4PNa_2$
Molecular weight: 233.07 D

Specification
Appearance:Off white to brownish powder
Solubility: Clear, fawn to brownish solution in water (c=100 mg/ml)
pH value: 7.0-8.0
ESI-MS: 188.011 ± 0.005 D

pAPP (HPLC): ≥90 area%
Water (K. Fischer): ≤15%
Na (flame photometric): 15-21%
p-Nitrophenylphosphate (HPLC): ≤0.3 area%
Cl: ≤0.1%
P_i (acid labile): ≤0.5%
P_i: ≤1%
Stability: At +2 to +8°C within specification range for 12 months. Protect from light.

4-Nitrophenyl Phosphate (pNPP)
disodium salt, crystalline powder

Cat. No.	Pack Size
10 004 847 103	custom fill

Will be supplied as "4-Nitrophenyl Phosphate, Disodium Salt". Unit of Measure is "kg".
Additional formulation: Tablets are available on request.
For further processing only.

Substrate for marker enzyme

Application
Use pNPP as a substrate for alkaline phosphatase.

CAS: 4264-83-9

Properties
Formula: $C_6H_4NO_6PNa_2 \times 6\ H_2O$
Molecular weight: 371.1 D (pNPP: 219.1 D)
Detection: at 405 nm

Specification
Appearance: White to slightly yellow crystalline powder
Solubility: Clear, colorless to slightly yellow solution in water (c=50 mg/ml)
pH value: 9±1
4-NPP-Na_2 x 6 H_2O (calculated from value found enzymatically): ≥95%
4-NPP (enzymatically): ≥56%
Na (flame photometric): 13 ± 1%
Water (K. Fischer): 28 ± 3%
4-Nitrophenol (free): ≤0.07%
P_i: ≤ 0.3%
Blank (with TC $A_{Popt.}$ ΔA/30 min) : ≤0.015
Reactions rates (AP): 100 ± 5%
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Protect from light.

Literature
B. Porstmann, T. Porstmann in T.T. Ngo: Nonisotopic Immunoassay, Plenum Press, N.Y. (1988)

5-Bromo-4-chloro-3-indolyl-phosphate (BCIP)
disodium salt, crystalline powder

Cat. No.	Pack Size
10 997 846 103	custom fill

Will be supplied as "5-Br-4-chloro-3-indolyl-phosphate, Di-Na". Unit of Measure is "kg".
DRY ICE
For further processing only.

Substrate for marker enzyme

Application
Use BCIP as precipitating substrate for alkaline phosphatase.

CAS: 102185-33-1

Properties
Formula: $C_8H_6NO_4BrClP \times Na_2 \times 1.5\ H_2O$
Molecular weight: 397.6 D (BCIP: 326.4 D)
Detection: Forms a blue precipitate

Specification
Appearance: White to slightly bluish microcrystalline powder
BCIP (from N): ≥79%
BCIP (HPLC): ≥99 area%
N (elementary analysis): ≥3.39%
Na (flame photometric): 10.5-12.5%
Water (K. Fischer) : 6.5-8.5%
Performance test (incubation with alkaline phosphatase, aerial oxidation): Blue precipitate
Stability: At -15 to -25°C within specification range for 12 months. Store dry. Protect from light.

5-Bromo-4-chloro-3-indolyl-phosphate (BCIP)
toluidin, crystalline powder

Substrate for marker enzyme

Cat. No.	Pack Size
10 760 978 103	custom fill

Will be supplied as "5-Br-4-Cl-3-indolyl- phosphate". Unit of Measure is "g".
For further processing only.

Application
Use BCIP as precipitating substrate for alkaline phosphatase.

CAS: 6578-06-09

Properties
Formula: $C_8H_6NO_4BrClP \times C_7H_9N$
Molecular weight: 433.6 D (BCIP: 326.4 D)
Detection: Forms a blue precipitate

Specification
Appearance: White to slightly yellowish microcrystalline powder
BCIP x toluidine (from N): ≥99%
BCIP x toluidine (HPLC): ≥99 area%
N (elementary analysis): 6.39-6.60%
Performance test (incubation with alkaline phosphatase, aerial oxidation): Blue precipitate
Stability: At +2 to +8°C within specification range for 24 months. Store dry. Protect from light.

Human Serum

frozen solution

Qualified for the Cobas® Core / Elecsys® Modular Platform.

Application

Basic matrix for manufacturing calibrators and controls for immunoassays and assays in clinical chemistry.

Benefits

Rely on the highly qualified and well characterized source of human serum.

Product Description

Frozen solution from pooled blood donors.

Specification

Appearance (optical check): Yellowish slight turbid liquid
Turbidity (A_{280}, against water): ≤0.600 E
pH value (+25°C): 7.0-7.5
Protein (Biuret):≥61 mg/ml
Cholesterol (CHOD-PAP): ≥140 mg/dl
Triglyceride (GPO-PAP): 65-206 mg/dil
Ca (o-Cresolphthalein complexone): ≤2.2 mmol/l
Cholinesterase (Butyrylthiocholine Gen 2): ≥4700 U/l
Creatine kinase (IFCC): ≤250 U/l
Non-reactive in HBsAg: corresponds
Anti-HIV I+II: negative
Anti-HCV: negative
HCV NAT non-reactive: corresponds
HIV-1 NAT non-reactive: corresponds
Stability: At -15°C to -25°C within specification range for 12 months.

Background Information

All products derived from human blood donors are prepared exclusively from the blood donors tested individually and shown to be free from HBsAg and antibodies to HCV and HIV. The testing methods applied were FDA-approved or cleared in compliance with the European Directive 98/79/EC, Annex II, List A.

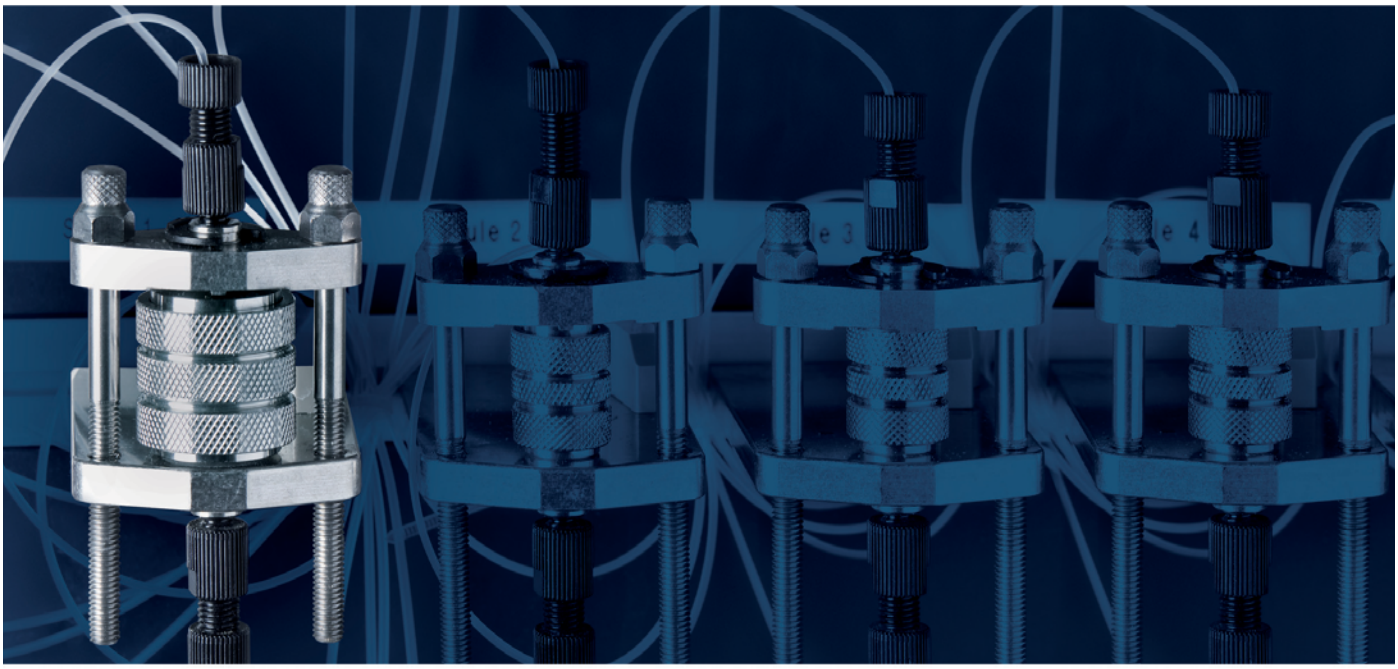
Cat. No.	Pack Size
11 758 225 103	9 L (samples 100 ml)

Will be supplied as "Serum <-> Human". Unit of Measure is "l".

DRY ICE

For further processing only.


CM
ML
11
10
9
8
7
6
5
4
3
2
1
100
75
50
25
10
GRUND
Roche



3 Molecular Diagnostics

Guanidine Hydrochloride
crystals

Cat. No.	Pack Size
11 696 548 103	500 g

Will be supplied as "Guanidinium Chloride, Solid". Unit of Measure is "kg".
For further processing only.

Application
Use Guanidine hydrochloride as a denaturing agent for proteins in a broad variety of nucleic acid purification applications.

Benefits
- **Perform high quality DNA and RNA purification.** Effectively denature all protein components in your nucleic acid.
- **Obtain intact mRNA and RNA.** Stabilize the RNA and mRNA molecules using highly concentrated Guanidinium Chloride solutions during the purification process.

CAS: 50-01-1

Properties
Formula: CH_5N_3 x HCl
Molecular weight: 95.53 D

Specification
Appearance: White, crystalline powder
Chloride (qualitative): Positive
Melting range (Büchi): 183-188°C
Solubility: Clear, colorless to slightly yellow (c=764.4 mg/ml in water, 8 mol/l)
Guanidinium chloride (from N): ≥99%
Guanidinium chloride (from Cl): ≥99%
Nitrogen (elementary analysis): 43.5-44.5%
Chloride (argentometric titration): 36.7-37.5%
Heavy metals (as Pb): ≤10 ppm
Fe: ≤3 ppm
Stability: At +15 to +25°C within specification range for 24 months.

DNase I, recombinant, Grade I

from bovine pancreas, expressed in *Pichia pastoris*, lyophilizate

Recombinant produced DNase I in PCR grade, lyophilized quality, free of animal-derived materials, is an essential tool for all applications requiring DNase-free RNA templates.

Application

DNase I, recombinant, Grade I, is suitable for:

- Isolation of DNA-free RNA produced by *in vitro* transcription
- Producing DNA-free preparations of protein and RNA:
  - To ensure that RT-PCR templates are free of genomic DNA
  - To remove DNA templates after *in vitro* transcription of RNA
- Nick-translation labeling of DNA with added DNA polymerase I
- Determining the "footprint" of a DNA-binding protein
- Microarray analysis

Benefits

- **Be compliant with regulatory requirements.** Assure that your applications are free of animal-derived materials.
- **Achieve reliable results.** Experience excellent quality and greater lot-to-lot consistency due to advanced production processes in conjunction with rigorous analytical testing.

Product Description

DNase I, recombinant, Grade I, originally isolated from bovine pancreas, is a recombinant enzyme expressed in *Pichia pastoris*. It is a glycoprotein of a molecular weight of approximately 39 kD. DNase I, recombinant, Grade I, is a DNA-specific endonuclease that hydrolyzes phosphodiester linkages of double- and single-stranded DNA to a mixture of mono- and oligonucleotides. DNase I, recombinant, Grade I, is manufactured using state-of-the-art processes yielding animal component-free material.

EC 3.1.21.1

Properties

Nomenclature: DNase I
pH optimum: 7.0–8.0
Activators: DNase I requires bivalent cations for maximal activity.
Inhibitors: EDTA, EGTA, SDS
Specificity: Double-strand specific endonuclease that degrades DNA

Specification

Appearance: White to slightly yellowish lyophilizate
Activity (calf thymus DNA): ≥10 kU/vial lyophilizate
Activity (calf thymus DNA, modified buffer system): No limit
Unit definition: One unit according to Kunitz produces an increase in absorbance of 0.001/minute under assay conditions in 1 ml at 260 nm.
Proteases (resorufin-marked casein): Not detectable in up to 50 U after 17 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 2 U after 4 hours incubation at +37°C.
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
03 724 778 103	10 kU

Will be supplied as "DNase I rec RGI (10 KU)". Unit of Measure is "piece".
For further processing only.

DNase I, recombinant, RNase-free

from bovine pancreas, expressed in *Pichia pastoris*, solution

Cat. No.	Pack Size
03 539 121 103	custom fill

Will be supplied as "DNase I rec RNase free in Glycerol". Unit of Measure is "kU".

DRY ICE

For further processing only.

Recombinant produced DNase I in PCR grade, solution quality, free of animal-derived materials, is an essential tool for all applications requiring DNase-free RNA templates.

Application

Use DNase I, recombinant, Grade I, for:

- Isolation of DNA-free RNA produced by *in vitro* transcription
- Producing DNA-free preparations of protein and RNA:
  - To ensure that RT-PCR templates are free of genomic DNA
  - To remove DNA templates after *in vitro* transcription of RNA
- Nick-translation labeling of DNA with added DNA polymerase I
- Determining the "footprint" of a DNA-binding protein
- Microarray analysis

Benefits

- **Be compliant with regulatory requirements.** Assure that your applications are free of animal-derived materials.
- **Achieve reliable results.** Experience excellent quality and greater lot-to-lot consistency due to advanced production processes in conjunction with rigorous analytical testing.
- **Obtain undegraded and stable RNA.** Rely on the highly purified and rigorously tested product that excludes RNase activity ensuring high sensitivity of your RT-PCR assay.

Product Description

DNase I, recombinant, RNase-free, originally isolated from bovine pancreas, is a recombinant enzyme expressed in *Pichia pastoris*. It is a glycoprotein of a molecular weight of approximately 39 kD. DNase I, recombinant, RNase-free, is a DNA-specific endonuclease that hydrolyzes the phosphodiester linkages of double- and single-stranded DNA to a mixture of mono- and oligonucleotides. DNase I, recombinant, is manufactured using state-of-the-art processes yielding animal component-free material.
The enzyme is highly purified and rigorously tested for contaminating RNase and protease activity for superb RT-PCR.

EC 3.1.21.1

Properties

Nomenclature: DNase I
pH optimum: 7.0-8.0
Activators: DNase I requires bivalent cations for maximal activity.
Inhibitors: EDTA, EGTA, SDS
Specificity: Double-strand specific endonuclease that degrades DNA

Specification

Appearance: Colorless to slightly yellow solution
Activity (calf thymus DNA): 9-14 kU/ml
Activity (calf thymus DNA, modified buffer system): No limit
Unit definition: One unit according to Kunitz produces an increase in absorbance of 0.001/minute under assay conditions in 1 ml at 260 nm.
Proteases (resorufin-marked casein): Not detectable in up to 50 U after 17 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 10 U after 4 hours incubation at +37°C.
Stability: At -15 to -25°C within specification range for 24 months.

Proteinase K, recombinant, PCR Grade

from *Titrirachium album*, expressed in *Pichia pastoris*, solution

Recombinant produced Proteinase K is free of animal-derived materials. In this PCR grade solution quality, this enzyme is a universal tool for a wide variety of template preparation applications.

Application

Proteinase K, recombinant, PCR Grade, digests native proteins very efficiently. This enzyme can be used to rapidly inactivate endogenous RNases and DNases during nucleic acid isolation. Proteinase K is particularly suited for the isolation of native RNA and DNA from tissues and cell lines.
The enzyme promotes cell lysis by activating a bacterial autolytic factor.
Proteinase K is also used for:

- Analysis of membrane structures by modifying proteins and glycoproteins on cell surfaces
- Removal of cellular debris during the preparation of colony lifts
- Treatment of tissue sections to ensure efficient probe infiltration during *in situ* hybridization

Benefits

- **Achieve reliable results.** Experience excellent quality and higher lot-to-lot consistency due to advanced production processes in conjunction with rigorous analytical testing.
- **Maximize the yield of target nucleic acids.** Proteinase K is rigorously tested for the absence of nucleases.
- **Effectively isolate low copy templates.** The DNA content of the enzyme preparation is strongly reduced, and the enzyme is tested for exogenous nucleic acids that may interfere in target amplification, potentially reducing sensitivity and test accuracy.

Product Description

Proteinase K, originally isolated from the mold *Tritirachium album*, is a recombinant enzyme expressed in *Pichia pastoris*. It is a highly active, subtilisin-related serine endopeptidases that does not exhibit any pronounced cleavage specificity. Thus, Proteinase K, recombinant, PCR Grade, is a universal tool for template preparation. Amino acid sequence and molecular structure of the recombinant enzyme and the native protease are identical. However, the production process of the recombinant Proteinase K guarantees an enzyme of outstanding reliability and purity meeting all the requirements of diagnostics' manufacturers.
Special emphasis has been placed on a low DNA-content of the enzyme preparation, making Proteinase K, recombinant, PCR Grade, ideally suited for isolating PCR and RT-PCR templates.

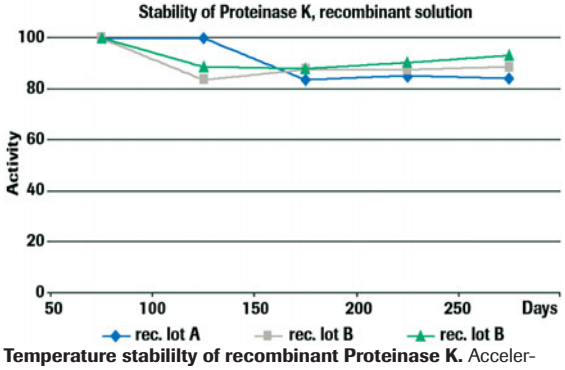
EC 3.4.23.1

Properties

Nomenclature: Proteinase K
Molecular weight: 28.8 kD
pH optimum: 7.5-10.5
Inhibitors: Proteinase K is inhibited by diisopropyl fluorophosphate and phenylmethylsulfonyl fluoride (PMSF) and is also totally inactivated by mercuric ions. Pefabloc® SC and Pefabloc® PLUS are specific, irreversible and nontoxic inhibitors.
Specificity: Proteinase K is one of the most active endopeptidases known and does not exhibit any pronounced cleavage specificity. Activity can be stimulated by addition of denaturing agents (SDS and urea).

Cat. No.	Pack Size
03 654 672 103	850 ml, custom fill

Will be supplied as "Proteinase K, rec., PCR grade, solution". Unit of Measure is "l".



Temperature stabililty of recombinant Proteinase K. Accelerated stability tests at high temperature show the robustness of the recombinant enzyme. Three different lots of recombinant Proteinase K solution were tested for their temperature- stress stability at +35°C. Only minor activity loss is observed.

For further processing only.

Specification

Appearance: Clear, colorless solution
Volume activity (+37°C, hemoglobin): ≥600 U/ml
Specific activity (+37°C, hemoglobin): ≥30 U/mg protein
Unit definition (hemoglobin): One unit is the enzyme activity which releases folin positive amino acids and peptides equivalent to 1 µmol of tyrosine in 1 minute under the test conditions.
Volume activity (+25°C, Chromozym): ≥50 U/ml
Specific activity (+25°C, Chromozym): ≥2.5 U/mg protein
Unit definition (Chromozym): One unit is the enzyme activity which cleaves at +25°C in 1 minute 18 mmol Chromozym TRY.
Protein (Biuret): 14.0-22.0 mg/ml
Unspecific endonucleases (MWM III DNA): Not detectable in up to 200 µg after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 200 µg after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 µg after 16 hours incubation at +37°C.
DNA (Threshold): ≤10 pg/mg enzyme
Bioburden: ≤5 CFU/ml
Stability: At +2 to +8°C within specification range for 18 months.

Proteinase K, recombinant, PCR Grade

from *Titrirachium album*, expressed in *Pichia pastoris*, lyophilizate

Recombinant produced Proteinase K is free of animal-derived materials. In PCR grade lyophilized quality, this enzyme is a universal tool for a wide variety of template preparation applications.

Application

Proteinase K, recombinant, PCR Grade, digests native proteins very efficiently. This enzyme can be used to rapidly inactivate endogenous RNases and DNases during nucleic acid isolation. Proteinase K is particularly suited for the isolation of native RNA and DNA from tissues and cell lines.
The enzyme promotes cell lysis by activating a bacterial autolytic factor.
Proteinase K is also used for:

- Analysis of membrane structures by modifying proteins and glycoproteins on cell surfaces
- Removal of cellular debris during the preparation of colony lifts
- Treatment of tissue sections to ensure efficient probe infiltration during *in situ* hybridization

Benefits

- **Achieve reliable results.** Experience excellent quality and higher lot-to-lot consistency due to advanced production processes in conjunction with rigorous analytical testing.
- **Maximize the yield of target nucleic acids.** Proteinase K is rigorously tested for the absence of nucleases.
- **Effectively isolate low copy templates.** The DNA content of the enzyme preparation is strongly reduced, and the enzyme is tested for exogenous nucleic acids that may interfere in target amplification, potentially reducing sensitivity and test accuracy.

Product Description

Proteinase K, originally isolated from the mold *Tritirachium album*, is a recombinant enzyme expressed in *Pichia pastoris*. It is a highly active, subtilisin-related serine endopeptidases that does not exhibit any pronounced cleavage specificity. Thus, Proteinase K, recombinant, PCR Grade, is a universal

Cat. No.	Pack Size
03 508 811 103	25 mg
03 450 376 103	50 mg
03 508 838 103	100 mg
03 450 384 103	250 mg
05 963 133 103	1 g
05 963 117 103	5 g

03450376103: Will be supplied as "Protein. K, rec PCR Grade Lyo. MPB 25mg". Unit of Measure is "piece".
03508811103: Will be supplied as "Protein. K, rec PCR Grade Lyo. MPB 50mg". Unit of Measure is "piece".
03508838103: Will be supplied as "Protein. K, rec PCR Grade Lyo. MPB 100mg". Unit of Measure is "piece".
03450384103: Will be supplied as "Protein. K, rec PCR Grade Lyo. MPB 250mg". Unit of Measure is "piece".
05963133103: Will be supplied as "Proteinase K, rec., PCR Grade, Lyo 1 g". Unit of Measure is "piece".
05963117103: Will be supplied as "Proteinase K, rec., PCR Grade, Lyo 5 g". Unit of Measure is "piece".
For further processing only.

tool for template preparation. Amino acid sequence and molecular structure of the recombinant enzyme and the native protease are identical. However, the production process of the recombinant Proteinase K guarantees an enzyme of outstanding reliability and purity meeting all requirements of diagnostics' manufacturers.
Special emphasis has been placed on a low DNA-content of the enzyme preparation, making Proteinase K, recombinant, PCR Grade, ideally suited for isolating PCR and RT-PCR templates.

EC 3.4.23.1

Properties

Nomenclature: Proteinase K
Molecular weight: 28.8 kD
pH optimum: 7.5-10.5
Inhibitors: Proteinase K is inhibited by diisopropyl fluorophosphate and phenylmethylsulfonyl fluoride (PMSF) and is also totally inactivated by mercuric ions. Pefabloc® SC and Pefabloc® PLUS are specific, irreversible and nontoxic inhibitors.
Specificity: Proteinase K is one of the most active endopeptidases known and does not exhibit any pronounced cleavage specificity. Activity can be stimulated by addition of denaturing agents (SDS and urea).

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=20 mg/ml)
Volume activity (+37°C, hemoglobin): ≥24 U/mg lyophilizate
Specific activity (+37°C, hemoglobin): ≥30 U/mg protein
Unit definition (hemoglobin): One unit is the enzyme activity which releases folin positive amino acids and peptides equivalent to 1 µmol of tyrosine in 1 minute under the test conditions.
Volume activity (+25°C, Chromozym): ≥2 U/mg lyophilizate
Specific activity (+25°C, Chromozym): ≥2.5 U/mg protein
Unit definition (Chromozym): One unit is the enzyme activity which cleaves at +25°C in 1 minute 18 mmol Chromozym TRY.
Unspecific endonucleases (MWM III DNA): Not detectable in up to 200 µg after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 200 µg after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 µg after 16 hours incubation at +37°C.
DNA (Threshold): ≤10 pg/mg enzyme
Bioburden: ≤125 CFU/g
Stability: At +2 to +8°C within specification range for 18 months.

RNase A

from bovine pancreas, lyophilizate, powder

Standard RNase A in lyophilized quality is an essential tool for applications requiring RNA-free DNA templates.

Application

Use RNase A for isolation of genomic DNA. For this purpose, RNase A should be boiled before use.

Benefits

- **Rely on consistent quality.** Assure that your applications deliver consistent results due to the long-term stability of lyophilized RNase A.

EC 3.1.27.5

Properties

Molecular weight: 13.7 kD
Specificity: Pyrimidine-specific endoribonuclease that acts on single-stranded RNA

Specification

Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=1 mg/ml)
Activity: ≥50 U/mg
Unit definition: One unit produces a decrease in absorbance from A_0 to A_1 in 1 minute under assay conditions (Kunitz). A_0 to A_1 corresponds to the total conversion, A_1 being the final absorbance.
Unspecific endonucleases (λDNA): Not detectable in up to 1 µg after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 1 µg after 4 hours incubation at +37°C.
Proteases (ΔA ≤0.1, 15 minutes, +37°C): Corresponds to reference
Turbidity, according to Maniatis (ΔA_{366} ≤0.100): Corresponds to reference
A_{280} (1 mg/ml water): 0.54-0.72
pH ≤5.0 treatment (≥3 hours): Corresponds to reference
Countries of origin: South Africa, Argentina, Australia, New Zealand, Uruguay or the United States
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Cat. No.	Pack Size
10 154 105 103	custom fill

Will be supplied as "Ribonuclease A from Bovine Pancreas". Unit of Measure is "g".
For further processing only.

Expand High Fidelity PCR System

For extremely accurate amplification of genomic DNA targets up to 5 kb using PCR.

Application

Use Expand High Fidelity PCR System for:

- Routine amplification of DNA fragments up to 5 kb from all DNA
- Amplification of DNA fragments up to 10 kb.
- Labeling of PCR products with modified nucleotides (*e.g.,* DIG-dUTP, biotin-dUTP, fluorescein-dUTP)
- Combination with dUTP and Uracil-DNA Glycosylase for prevention of carryover contamination between PCR reactions
- Manufacture of amplification mixtures for regulated applications (*e.g., in vitro* diagnostics, quality control), including validation

Benefits

- **Improve fidelity of PCR.** Use this enzyme blend with its threefold greater accuracy than Taq Polymerase for more precise amplification of longer DNA templates.
- **Maximize target yield.** Minimize amplification of prematurely terminated products using an ideally formulated proofreading enzyme for increased full-length yields.
- **Save time using improved chemistry.** The balanced enzyme blend is optimized for high fidelity and yield.
- **Obtain consistent robust results.** The specially formulated buffer and magnesium concentration ensure high lot-to-lot consistency.

Product Description

Enzyme blend consisting of Taq DNA Polymerase and Tgo DNA Polymerase.

EC 2.7.7.7

Properties

Enzymes in Expand High Fidelity PCR System were originally isolated from the thermophilic eubacteria *Thermus aquaticus* (Taq) BM or *Thermococcus gorgonarius* (Tgo), both expressed in *E. coli*.
Enzyme acivities:
Taq Polymerase: Highly processive 5'-3' DNA polymerase; double-strand-specific 5'-3' exonuclease; no 3'-5' exonuclease activity
Tgo Polymerase: Highly processive 5'-3' DNA polymerase; double-strand-specific 3'-5' exonuclease (also known as proofreading activity); no 5'-3' exonuclease activity.
pH optimum: Approximately 8.9 (+20°C)
Temperature optimum:
Fragment length <3 kb: Approximately +72°C
Fragment length >3 kb: Approximately +68°C
Substrates: Incorporates dNTP, dUPT, various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants)
Divalent ion requirement: Mg^{2+} (1.5 mmol/l standard concentration)
Recommended usage per 50 µl reaction: 2.5 U (0.7 µl)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; EDTA, 0.1 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C
Volume activity: ≥3.5 U/µl
RNases (MSII-RNA): Not detectable in incubation with up to 30 U after 1 hour at +37°C.

Cat. No.	Pack Size
03 310 256 103	custom fill

Will be supplied as "Expand High Fidelity". Unit of Measure is "kU". The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 48

For the best fit reaction buffer, use Expand High Fidelity PCR Buffer, see page 228

Function test in PCR (200 ng human genomic DNA, 4.8 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand High Fidelity PCR Buffer
10x conc., with $MgCl_2$

Standard reaction buffer for PCR using the Expand High Fidelity PCR System.

Application
Use this buffer together with Expand High Fidelity PCR System.

Benefits
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible PCR experiments.
- **Gain excellent performance.** Take full advantage of the Expand High Fidelity PCR System using a specially optimized reaction buffer.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 220 mmol/l; $MgCl_2$, 15 mmol/l; pH approximately 8.9 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test in PCR (human genomic DNA, 4.8 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
05 917 131 103	1 ml 1 piece contains 1 ml.

Will be supplied as "Exp.HF Buffer 10x w MgCl2 MPB". Unit of Measure is "piece".

DRY ICE

For further processing only.

Expand High Fidelity PCR Buffer
10x conc., without $MgCl_2$

Standard reaction buffer without $MgCl_2$ for optimization of $MgCl_2$ concentration in PCR using the Expand High Fidelity PCR System.

Application
Use this buffer together with Expand High Fidelity PCR System. whenever the amplification of difficult targets requires a $MgCl_2$ concentration that needs to be individually optimized.

Benefits
- **Amplify difficult targets.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer with an optimized $MgCl_2$ concentration for best results.
- **Gain excellent performance.** Take full advantage of the Expand High Fidelity PCR System using a specially optimized reaction buffer.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 220 mmol/l; pH approximately 8.9 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.

Cat. No.	Pack Size
05 917 123 103	1 ml 1 piece contains 1 ml.

Will be supplied as "Exp.HF Buff. 10x w/o MgCl2 MPB". Unit of Measure is "piece".

DRY ICE

For further processing only.

Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test in PCR (human genomic DNA, 4.8 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand Long Template PCR System

For extremely accurate amplification of genomic DNA targets up to 20 kb using polymerase chain reaction (PCR).

Application

Use Expand Long Template PCR System for:

- Routine amplification of DNA fragments up to 20 kb from all DNA
- Amplification of DNA fragments up to 40 kb from λDNA
- Labeling of PCR products with modified nucleotides (*e.g.,* DIG-dUTP, biotin-dUTP, fluorescein-dUTP)
- Combination with dUTP and Uracil-DNA Glycosylase for prevention of carryover contamination between PCR reactions
- Manufacture of amplification mixtures for regulated applications (*e.g., in vitro* diagnostics, quality control), including validation

Benefits

- **Amplify longer templates than ever before.** Generate PCR products 5 to 20 kb in length from complex genomic DNA using this optimized enzyme blend.
- **Achieve higher yields and fidelity.** Three times higher fidelity with much higher yield compared to Taq DNA Polymerase.
- **Improve PCR efficiency.** More full-length product characterizing human gene loci, fingerprinting DNA, and isolating entire genes from cDNA or entire viral genomes.

Product Description

Enzyme blend consisting of Taq DNA Polymerase and Tgo DNA Polymerase.

EC 2.7.7.7

Properties

Enzymes in the Expand Long Template PCR System were originally isolated from the thermophilic eubacteria *Thermus aquaticus* (Taq) BM and *Thermococcus gorgonarius* (Tgo), both expressed in *E. coli*.
Enzyme acivities:
Taq Polymerase: Highly processive 5'-3' DNA polymerase, double-strand specific 5'-3' exonuclease, no 3'-5' exonuclease activity
Tgo Polymerase: Highly processive 5'-3' DNA polymerase, double-strand specific 3'-5' exonuclease (also known as proofreading activity), no 5'-3' exonuclease activity
Temperature optimum:
Fragment length <3 kb: Approximately +72°C
Fragment length >3 kb: Approximately +68°C
Substrates: Incorporates dNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+} (1.75 mmol/l when using 350 µmol/l of each dNTP; 2.75 mmol/l when using 500 µmol/l of each dNTP)
Recommended usage per 50 µl reaction: 0.5-5.0 U (3.75 U standard concentration)

Specification

Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; EDTA, 0.1 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C

Cat. No.	Pack Size
03 321 053 103	custom fill

Will be supplied as "Expand LT PCR Sys. Enzymmix, Bulk". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 48

- For the best fit reaction buffer, use Expand Long Template PCR Buffer 1, see page 230
- For the best fit reaction buffer, use Expand Long Template PCR Buffer 2, see page 230
- For the best fit reaction buffer, use Expand Long Template PCR Buffer 3, see page 231

Volume activity: ≥5 U/µl
RNases (MSII-RNA): Not detectable in incubation with up to 30 U after 1 hour at +37°C.
Function test in PCR (200 ng human genomic DNA; 9.3, 12, and 15 kb fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand Long Template PCR Buffer 1

10x conc., with 17.5 mM $MgCl_2$

Cat. No.	Pack Size
05 917 115 103	1 ml

Will be supplied as "Expand LT PCR Buffer 1 (10x), 1 ml". Unit of Measure is "piece".
For further processing only.

Reaction buffer 1 for PCR of fragments from 0.5 to 12 kb using the Expand Long Template PCR System.

Application

Use this buffer together with Expand Long Template PCR System.

Benefits

- **Gain excellent performance.** Take full advantage of the Expand Long Template PCR System using the specially optimized reaction buffer 1 for amplification of fragments from 0.5 to 12 kb.
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled reaction buffer for fast and easy setup of highly reproducible PCR experiments.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 160 mmol/l; $MgCl_2$, 17.5 mmol/l; pH approximately 9.2 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test in PCR (200 ng human genomic DNA, 9.3 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand Long Template PCR Buffer 2

10x conc., with 27.5 mM $MgCl_2$

Cat. No.	Pack Size
05 420 075 103	1 ml

Will be supplied as "Expand LT PCR Buffer 2 (10x), 1 ml". Unit of Measure is "piece".
For further processing only.

Reaction buffer 2 for PCR of fragments from 12 to 15 kb using the Expand Long Template PCR System.

Application

Use this buffer together with Expand Long Template PCR System.

Benefits

- **Gain excellent performance.** Take full advantage of the Expand Long Template PCR System using the specially optimized reaction buffer 2 for amplification of fragments from 12 to 15 kb.
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled reaction buffer for fast and easy setup of highly reproducible PCR experiments.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 160 mmol/l; $MgCl_2$, 27.5 mmol/l; DMSO, 20%; Tween 20, 1%; pH approximately 9.2 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test in PCR (200 ng human genomic DNA, 12 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand Long Template PCR Buffer 3

10x conc., with 27.5 mM $MgCl_2$

Reaction buffer 3 for PCR of fragments larger than 15 kb using the Expand Long Template PCR System.

Application

Use this buffer together with Expand Long Template PCR System.

Benefits

- **Gain excellent performance.** Take full advantage of the Expand Long Template PCR System using the specially optimized reaction buffer 3 for amplification of fragments larger than 15 kb.
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled reaction buffer for fast and easy setup of highly reproducible PCR experiments.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 220 mmol/l; $MgCl_2$, 27.5 mmol/l; DMSO, 20%; Tween 20, 1%; pH approximately 9.2 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test in PCR (200 ng human genomic DNA, 15 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
05 420 083 103	1 ml

Will be supplied as "Expand LT PCR Buffer 3 (10x), 1 ml". Unit of Measure is "piece".
For further processing only.

T4 DNA Polymerase

from T4 plasmid pTL43W infected *E. coli* 71-18, solution

Use T4 DNA Polymerase for 3' labeling of DNA.

Application

Use T4 DNA Polymerase for:

- Labeling of 3' termini of DNA. Extensive labeling is achieved using the replacement reaction in which the 3'-exonuclease activity of the enzyme first digests dsDNA to produce molecules with recessed 3' termini. After addition of high concentrations of labeled dNTP, the polymerase activity extends the 3' ends along the length of the template
- Gap-filling in site-directed mutagenesis experiments, in combination with T4 Gene 32 Protein

Benefits

- **Obtain improved performance.** Take advantage of this highly processive, contamination-controlled T4 DNA Polymerase.

EC 2.7.7.7

Properties

Enzyme activities: T4 DNA Polymerase is a DNA-dependent DNA polymerase which catalyzes the addition of dNTP to hydroxyl-termini of recessive ends of double-stranded DNA. With low dNTP concentrations, the enzyme has an extreme 3'-5' exonuclease activity. It has no 5'-3' exonuclease activity.
dNTP concentration: With <1 µmol/l dNTP, the exonuclease activity of T4 DNA Polymerase dominates and template DNA is degraded; 1 to 2 µmol/l dNTP are used for specific polymerase activity in labeling experiments. For maximal polymerase activity, exonuclease activity can be suppressed using high dNTP concentrations up to 100 µmol/l.
pH optimum: 8.0-9.0
Divalent ion requirement: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 10 mmol/l; $MgCl_2$, 2.5 mmol/l; NaCl, 100 mmol/l; DTE, 2 mmol/l; EDTA, 0.5 mmol/l; glycerol, 50% (v/v); pH approximately 8.0 at +4°C
Volume activity: ≥1 U/µl
Unit definition: One unit T4 DNA Polymerase is defined as the amount of enzyme which catalyzes the incorporation of 10 nmol [^{3}H]dNTP into acid insoluble DNA in 30 minutes at +37°C.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Nuclease activity on single-stranded DNA (M13mp9 ssDNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
11 004 778 103	custom fill

Will be supplied as "DNA Polymerase, T4". Unit of Measure is "kU". The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use T4 DNA Polymerase Incubation Buffer, see page 233

T4 DNA Polymerase Incubation Buffer
5x concentrated

Standard reaction buffer for 3' labeling of DNA using T4 DNA Polymerase.

Application
Use this T4 DNA Polymerase Incubation Buffer together with T4 DNA Polymerase. For a list of applications, refer to ***T4 DNA Polymerase.***

Benefits
- **Gain excellent performance.** Take full advantage of T4 DNA Polymerase using a reaction buffer specially optimized for this enzyme.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 0.25 mmol/l; $MgCl_2$, 35 mmol/l; β-Mercaptoethanol, 50 mmol/l; EDTA, 0.5 mmol/l; $(NH_4)_2SO_4$, 75 mmol/l; BSA, 0.1 mg/ml; pH approximately 8.8 at +25°C **Unspecific endonucleases** (λDNA and pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Function test in combination with T4 DNA Polymerase: Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 187 168 103	1 ml

Will be supplied as "T4 DNA Polymerase Incubation Buffer 5x".
Unit of Measure is "piece".
For further processing only.

Taq DNA Polymerase, GMP Grade, 5 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Taq DNA Polymerase is the robust standard enzyme for the amplification of DNA fragments up to 3 kb in the polymerase chain reaction (PCR).

Application

Use Taq DNA Polymerase, GMP Grade, 5 U/µl, for:

- Routine PCR and RT-PCR applications
- Amplification of DNA fragments up to 3 kb from various sources of DNA
- Labeling of DNA with modified nucleotides (*e.g.,* DIG-dUTP, biotin-dUTP, fluorescein-dUTP)
- Combination with dUTP and Uracil-DNA Glycosylase for prevention of carryover contamination between PCR reactions
- Manufacture of amplification mixtures for applications with regulatory requirements (*e.g.,in vitro* diagnostics, quality control)

Benefits

- **Obtain consistent results.** Rely on the robust reaction performance and the lot-to-lot consistency of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to GMP (Good Manufacturing Practice) regulations.
- **Profit from cost efficiency.** Benefit from low cost per reaction.

EC 2.7.7.7

Properties

Taq DNA Polymerase is the recombinant full-length version of the thermostable enzyme from the eubacterium *Thermus aquaticus* BM, expressed in *E. coli*.
Enzyme acivities: Highly processive 5'-3' DNA polymerase; double-strand specific 5'-3' exonuclease; no 3'-5' exonuclease activity
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Substrates: Incorporates dNTP, dUPT, dITP, various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants)
Divalent ion requirement: Mg^{2+} (1.5 mmol/l standard concentration)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C.
Volume activity: ≥5 U/µl
Specific activity (Protein: A_{280}): ≥130,000 U/mg
Unit definition: One unit Taq DNA Polymerase is defined as the amount of enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Purity (SDS PAGE): ≥98%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 10 U after 1 hour incubation at +37°C.
Function test in PCR (10 pg λDNA, 0.5 kb fragment): Corresponds to

Cat. No.	Pack Size
03 707 610 103	1 kU
03 707 628 103	5 kU
03 161 455 103	50 kU

03707610103: Will be supplied as "Taq DNA Polymerase Ind. GMP Grade, 1 kU". Unit of Measure is "piece".
03707628103: Will be supplied as "Taq DNA Polymerase Ind. GMP Grade, 5 kU". Unit of Measure is "piece".
03161455103: Will be supplied as "Taq DNA Polym GMP Grade 50ku". Unit of Measure is "piece".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 48

For the best fit reaction buffer, use PCR Buffer ,see page 237
For the best fit reaction buffer, use PCR Buffer Without $MgCl_2$, 10x concentrated, see page 237

reference
Function test in qPCR using LightCycler®
(human genomic DNA, β-globin gene): Corresponds to reference
(plasmid DNA, β-globin gene): Corresponds to reference
Bioburden: ≤50 CFU/ml
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Taq DNA Polymerase, 5 U/µl
from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Taq DNA Polymerase is the robust standard enzyme for the amplification of DNA fragments up to 3 kb in the polymerase chain reaction (PCR).

Application
For applications see ***Taq DNA Polymerase, GMP Grade, 5 U/µl***

Benefits
- **Obtain consistent results.** Rely on the robust reaction performance and lot-to-lot consistency of this product.
- **Profit from cost efficiency.** Benefit from low cost per reaction.

EC 2.7.7.7

Properties
See ***Taq DNA Polymerase, GMP Grade, 5 U/µl***

Specification
Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v), pH approximately 8.0 at +4°C
Volume activity: ≥5 U/µl
Unit definition: One unit Taq DNA polymerase is defined as the amount of enzyme that
incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Function test in PCR using conventional blockcycler (10 pg λDNA, 0.5 kb fragment): Corresponds to reference
Function test in qPCR using LightCycler® System
(human genomic DNA, β-globin gene): Corresponds to reference
(plasmid DNA, β-globin gene): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
11 147 633 103	custom fill

Will be supplied as "Taq DNA Polymerase". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.
DRY ICE
For further processing only.
Patent and License Disclaimer(s): 48

For the best fit reaction buffer, use PCR Buffer, see page 237
For the best fit reaction buffer, use PCR Buffer Without $MgCl_2$, 10x concentrated, see page 237

Taq DNA Polymerase, 50 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, glycerol-free solution

Taq DNA Polymerase is the robust standard enzyme for the amplification of DNA fragments up to 3 kb in the polymerase chain reaction (PCR).

Application

Use Taq DNA Polymerase, 50 U/µl, especially for:

- Setup of PCR master mixtures, when highly concentrated components are required
- Preparation of dried amplification mixtures for more convenience and increased stability at ambient temperature

For further applications see ***Taq DNA Polymerase, GMP Grade, 5 U/µl***

Benefits

- **Prepare dried amplification mixtures.** Use this formulation for manufacture of dried-down reagents with high stability and convenience.
- **Obtain consistent results.** Rely on the robust reaction performance and the lot-to-lot consistency of this product.
- **Profit from cost efficiency.** Benefit from low cost per reaction.

Product Description

High concentrated, glycerol-free solution, ideal for preparation of dried-down amplification mixtures.

EC 2.7.7.7

Properties

See ***Taq DNA Polymerase, GMP Grade, 5 U/µl***

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); pH approximately 8.0 at +4°C
Glycerol content: ≤0.1% (v/v)
Volume activity: 55±5 U/µl
Unit definition: One unit Taq DNA Polymerase is defined as the amount of enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Function test in qPCR using LightCycler® 480 System (human genomic DNA, tPA gene): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
04 827 007 103	custom fill

Will be supplied as "Taq DNA Pol., Glycerol-free". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 48

PCR Buffer

10x conc., with 15 mM $MgCl_2$

Standard reaction buffer for PCR using Taq DNA Polymerase.

Application

Use this buffer together with Taq DNA Polymerase. For a list of applications, refer to ***Taq DNA Polymerase, GMP Grade, 5 U/µl.***

Benefits

- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible PCR experiments.
- **Achieve excellent PCR performance.** Take full advantage of Taq DNA Polymerase, GMP Grade, using this specially optimized reaction buffer.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 100 mmol/l; KCl, 500 mmol/l; $MgCl_2$, 15 mmol/l; pH approximately 8.3 at +20°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Function test in PCR (0.01 ng λDNA, 0.5 kb lambda fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
11 974 769 103	1 ml
11 271 326 103	custom fill

11271318103: Will be supplied as "PCR Buffer 10x 1 ml". Unit of Measure is "piece". 11271326103: Will be supplied as "PCR Buffer 10x". Unit of Measure is "ml".

DRY ICE

For further processing only.

PCR Buffer

10x conc., without $MgCl_2$

Standard PCR reaction buffer without $MgCl_2$ using Taq DNA Polymerase for individual $MgCl_2$ optimization.

Application

Use this buffer without $MgCl_2$ together with Taq DNA Polymerase, GMP Grade, 5 U/µl for amplification of difficult targets requiring a $MgCl_2$ concentration that is optimized individually.

Benefits

- **Amplify difficult DNA targets using an improved buffer.** For best results use this premixed, pH-adjusted, contamination-controlled reaction buffer with individually optimized $MgCl_2$ concentrations.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 100 mmol/l; KCl, 500 mmol/l; pH approximately 8.3 at +20°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activitiy (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Function test in PCR (0.01 ng λDNA, 0.5 kb lambda fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
11 600 753 103	1 ml
11 600 761 103	custom fill

11600753103: Will be supplied as "PCR Buffer(10x) w/o MgCl2 MPB". Unit of Measure is "piece".
11600761103: Will be supplied as "PCR Puffer (10x) w/o MgCl2/ Bulk". Unit of Measure is "ml".

DRY ICE

For further processing only.

Tth DNA Polymerase

from *Thermus* species, expressed in *E. coli*, solution

Tth DNA Polymerase is a thermostable DNA Polymerase with intrinsic reverse transcriptase activity for RT-PCR amplification of RNA to a length of at least 1 kb.

Application

Use Tth DNA Polymerase for:

- One-step RT-PCR of single copy genes from eucaryotic genomes in the presence of Mn^{2+} ions
- One-step RT-PCR of a specific transcript or an entire population of transcripts
- PCR in the presence of Mg^{2+} ions
- Labeling of PCR products with modified nucleotides

Benefits

- **Amplify directly from RNA.** Benefit from the intrinsic reverse transcriptase activity of Tth Polymerase to directly amplify from RNA in one step.
- **Improve PCR yield.** Obtain more PCR product, because the Tth Polymerase is stable during prolonged repetitive high temperature incubations.
- **Enhance specificity of amplification.** Avoid loss of specificity due to RNA secondary structure using the higher annealing temperature Tth Polymerase allows compared to other reverse transcriptases.

EC 2.7.7.7

Properties

Tth Polymerase is the recombinant version of the thermostable enzyme from the thermophilic eubacterium *Thermus thermophilus* species, expressed in *E. coli*.
Enzyme activities: Highly processive 5'-3' DNA polymerase; no 3'-5' exonuclease activity; very efficient intrinsic reverse transcriptase (RT) activity in the presence of manganese ions; no RNase H activity
pH optimum: Approximately 9.0 (+25°C)
Temperature optimum for elongation: Approximately +72°C
Temperature optimum for reverse transcription: Approximately +60 to +70°C
Divalent ion requirement for PCR: Mg^{2+}
Divalent ion requirement for RT activity and RT-PCR: Mn^{2+}
Substrates: Incorporates dNTP, dUTP, dITP, various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 10 mmol/l; KCl, 300 mmol/l; EDTA, 0.1 mmol/l; DTT, 1 mmol/l; Triton X-100, 0.1% (v/v); glycerol, 50% (v/v); pH approximately 7.5 at +25°C
Volume activity: ≥5 U/µl
Unit definition: One unit Tth DNA Polymerase is defined as the amount of enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 U after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 U after 16 hours incubation at +65°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 U after 4 hours

Cat. No.	Pack Size
11 485 954 103	custom fill

Will be supplied as "Tth DNA Polymerase". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 01

- For optimal reverse transcription activity of Tth DNA Polymerase, add $Mn(OAc)_2$ Stock Solution, see page 239
- For the best fit reaction buffer, use Tth DNA Polymerase Incubation Buffer, see page 239

incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 20 U after 4 hours incubation at +65°C.
Function test in PCR (10 ng human genomic DNA, 1.1 kb collagen fragment): Corresponds to specification
Function test in RT-PCR (10 ng human liver RNA, 630 bp MCAD fragment): Corresponds to specification
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 18 months.

Tth DNA Polymerase PCR Buffer
10x conc., with 15 mM $MgCl_2$

Cat. No.	Pack Size
05 187 176 103	1 ml

Will be supplied as "Tth PCR Buffer 10x, 1ml". Unit of Measure is "piece".
For further processing only.

Standard reaction buffer for PCR using Tth DNA Polymerase.

Application
Use this Tth DNA Polymerase PCR Buffer in combination with Tth DNA Polymerase for PCR applications.

Benefits
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible PCR experiments.
- **Gain better performance.** Take full advantage of Tth DNA Polymerase using a reaction buffer specially optimized for this enzyme.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 100 mmol/l; KCl, 1 mol/l; $MgCl_2$, 15 mM; BSA, 500 µg/ml; Tween 20, 0.5%; pH approximately 8.9 at +25°C
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µl after 4 hours incubation at +37°C.
Function test (10 ng human genomic DNA, 1.1 kb collagen fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

$Mn(OAc)_2$ Stock Solution
25 mM

Cat. No.	Pack Size
05 187 109 103	1 ml

Will be supplied as "Mn(OAc)2 Stock Solution, 25 mM". Unit of Measure is "piece".
For further processing only.

RT-PCR grade Mn-acetate solution.

Application
Use this $Mn(OAc)_2$ Stock Solution in combination with the Tth DNA Polymerase RT-PCR Buffer to optimize the manganese concentration.

Benefits
- **Obtain reliable results.** Rely on the high lot-to-lot consistency of this product, thoroughly tested for constant quality.
- **Simplify your RT-PCR setup.** Save time producing a suitable, pure manganese solution by using this ready-to-use formulation.

Specification
Appearance: Clear, colorless to pinkish solution

Contents: Mn-acetate, 25 mmol/l
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test (10 ng human liver RNA, 630 bp MCAD fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Tth DNA Polymerase RT-PCR Buffer
5x concentrated

Cat. No.	Pack Size
05 187 079 103	1 ml

Will be supplied as "Tth RT-PCR Buffer 5x, 1ml". Unit of Measure is "piece".
For further processing only.

Standard reaction buffer for RT-PCR using Tth DNA Polymerase.

Application
Use this Tth DNA Polymerase RT-PCR Buffer in combination with Tth DNA Polymerase for RT-PCR applications.

Benefits
- **Retranscribe and amplify difficult targets.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer with a customized manganese concentration for best results.
- **Gain better performance.** Take full advantage of Tth DNA Polymerase using a reaction buffer specially optimized for this enzyme.

Specification
Appearance: Clear, colorless solution
Contents: Bicine/KOH, 0.25 mol/l; potassium acetate, 575 mmol/l; glycerol, 40% (v/v); pH approximately 8.2
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Function test (10 ng human liver RNA, 630 bp MCAD fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

RMS Z05 DNA Polymerase, 200 U/µL
from *Thermus* species Z05, expressed in *E. coli*, solution

Cat. No.	Pack Size
05 206 979 190	20 kU
05 206 987 190	200 kU

05206979190: Will be supplied as "CMPNT RMS Z05 20KU, 200U/uL 0.1mL". Unit of Measure is "piece".
05206987190: Will be supplied as "CMPNT RMS Z05 200KU, 200U/uL 1.0mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 66

RMS Z05 DNA Polymerase is a one-step RT-PCR DNA polymerase.

Application
Use RMS Z05 DNA Polymerase for:
- Single buffer RT-PCR
- Reverse transcription of RNA targets up to 1kb
- Incorporation of modified nucleotides for labeling of PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green

Benefits
- Simplify PCR setup by using an RNA- and DNA-dependent DNA polymerase activity for PCR and RT-PCR.
- Rely on high lot-to-lot consistency and full traceability with GMP manufacturing.
- Obtain increased specificity, sensitivity, efficiency, and RT-PCR yield due to high temperature RT.

- Control carryover contamination with a dUTP and Uracil-DNA Glycosylase treatment (UNG) compatible setup.
- Enjoy long product shelf life with 24 months stability.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Tween 20, 0.2% (v/v); glycerol, 50.0% (v/v); pH approximately 8.0 at +4°C
Volume activity: 200-240 U/µl
Purity: One major band
Stability: At -15 to -25°C within specification range for 24 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

ActiTaq Δexo DNA Polymerase

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

ActiTaq Δexo DNA Polymerase is a chemically modified, N-terminal truncated Taq DNA polymerase without 5'-3' exonuclease activity. This modified DNA polymerase is ideal for specific, sensitive DNA amplification using hot start PCR with enzyme activation during initial heat denaturation to optimally detect mismatches.

Application

Use ActiTaq Δexo DNA Polymerase for:

- SNP analysis and genotyping
- Allele-specific PCR
- Multiplexing up to 350 bp
- Random primed PCR

Benefits

- **Optimize your SNP analysis.** Discriminate paired and unpaired primer ends using an enzyme optimized for allele-specific PCR.
- **Increase specificity of PCR.** The 5'-3' exonuclease activity without hot start will not amplify nonspecific, low-temperature primer-template hybrids.
- **Fine-tune your hybridization probe qPCR.** Avoid hybridization probe degradation using a 5'-3' exonuclease activity lacking polymerase.

EC 2.7.7.7

Properties

ActiTaq Δexo DNA Polymerase is designed for hot start PCR and must be heat-activated at the beginning of the PCR.
Enzyme activities: Highly processive 5'-3' DNA polymerase; no 5'-3' exonuclease activity; no 3'-5' exonuclease activity
Heat-activation: +95°C for 3-10 minutes (assay-dependent, recommendation is 10 minutes for full activation)
pH optimum: Approximately 8.3 (+25°C)
Temperature optimum: Approximately +72°C
Standard reaction buffer: Tris/HCl, 10 mmol/l; KCl, 6.25 mmol/l final concentration at pH 8.3
Substrates: Incorporates dNTP, dUPT, dITP, various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants)
Divalent ion requirement: Mg^{2+} (2.0 mmol/l standard concentration)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; EDTA, 0.1 mmol/l; DTT, 1 mmol/l; Tween 20; 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.5 at +25°C
Volume Activity: 4.4±0.4 U/µl
Residual activity prior reactivation: <5%
Performance test in qPCR using LightCycler® 480: Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
03 788 075 103	custom fill

Will be supplied as "ActiTaq delta exo DNA Polymerase". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

For further processing only.

Patent and License Disclaimer(s): 49

AptaTaq DNA Polymerase, 5 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

The novel AptaTaq hot start PCR technology combines the native speed and robustness of Taq DNA Polymerase with a fast hot start system ensuring sensitive, and specific amplification of the target DNA.

Application

Apply AptaTaq DNA Polymerase for:

- Fast PCR assays with no extra enzyme activation time and fast cycling protocols
- Single- and multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- RT-PCR
- Difficult templates, such as complex secondary structures or GC-rich sequences
- Automated PCR workflows requiring high stability of the reaction mixtures during automated pipetting and prolonged handling at room temperature

Benefits

- **Reduce time to result.** Save up to 15 minutes per run by omitting the initial activation step required by chemically modified hot start polymerases, and reduce cycling time with fast protocols.
- **Maximize specificity, sensitivity, and yield.** Achieve reliable amplification of your target DNA from various sources (*e.g.,* genomic DNA, cDNA, plasmids).
- **Simplify PCR setup.** Store these highly stable polymerase for up to 1 month at +2° to +8°C and set up your hot start PCR reaction at room temperature.
- **Obtain consistent results.** Rely on Roche's standardized manufacturing processes, including extensive Quality Control release testing, resulting in high lot-to-lot consistency providing the perfect basis for (IVD) kit manufacturers and end users.

Product Description

AptaTaq DNA Polymerase is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) providing hot start features.

EC 2.7.7.7

Properties

AptaTaq DNA Polymerase is reversibly inhibited below +55°C and becomes active at temperatures over +60°C. This hot start feature eliminates the risk of nonspecific primer extension during PCR setup.
Enzyme acivities: Highly processive 5'-3' DNA polymerase; double-strand-specific 5'-3' exonuclease; no 3'-5' exonuclease activity
pH optimum: Approximately 9.0 (+20°C)
Activation temperature: Active at ≥+60°C
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Substrates: Incorporates dNTP and various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants).
Divalent ion requirement: Mg^{2+} (1.5 mmol/l standard concentration)

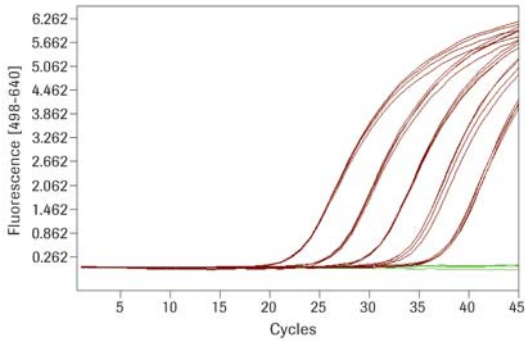
Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50.0% (v/v); pH approximately 8.0 at +4°C

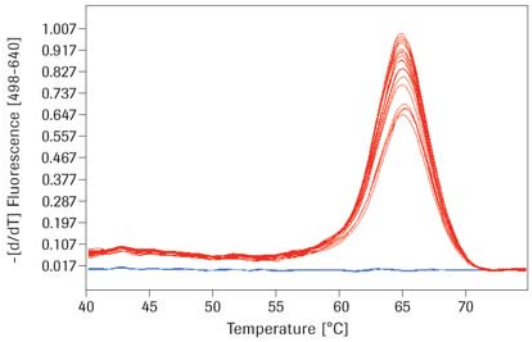
Cat. No.	Pack Size
05 457 882 103	custom fill

Will be supplied as "AptaTaq DNA Polymerase, 5 U/µl". Unit of Measure is "kU".

DRY ICE



Sensitivity of AptaTaq DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument.
Various amounts of plasmid DNA (5000 fg to 0.5 fg) were used for the amplification of a Factor V wild-type fragment using HybProbe probe format. Even 5 fg can be detected without difficulties.



Specificity of AptaTaq DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument.
Melting curve analysis of Factor V wild-type fragments amplified from plasmid DNA (5000 fg to 0.5 fg) using HybProbe probe format results in a sharp Tm peak at about 65°C.

For further processing only.

Patent and License Disclaimer(s): 63

Volume activity: 5.5±0.5 U/µl
Aptamer concentration (HPLC): 3.6 µmol/l ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +36°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background Information

The aptamer/polymerase mixture is a hot start system with reversible inhibition of the polymerase activity at lower temperatures. Polymerase inactivation is achieved by a tight bond of the folded aptamer-oligonucleotide to the active site of the polymerase at lower temperatures. Upon heating above +60°C, the aptamer acts like a molecular switch, changing its temperature-dependent tertiary structure and releasing the active polymerase. Dropping the temperature below +55°C shuts off the polymerase activity again. Similar to antibody-based methods, the enzyme is much more quickly activated by heating, than chemically modified polymerases. In contrast to antibodies, the aptamer-oligonucleotide is much more stable, allowing longer storage at room temperature.

AptaTaq DNA Polymerase, 50 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, glycerol-free solution

Novel AptaTaq hot start PCR technology preserves the native speed and robustness of Taq DNA Polymerase in combination with a fast hot start system to ensuring sensitive and specific target DNA amplification. High concentration for dried-down amplification mixes.

Application

Apply AptaTaq DNA Polymerase for:

- Fast PCR assays with no extra enzyme activation time and fast cycling protocols
- Single- or multiplex PCR and qPCR applications requiring high specificity, sensitivity, and yield
- RT-PCR
- Difficult templates with secondary structures or GC-rich sequences
- Formulation of dried-down amplification reagents

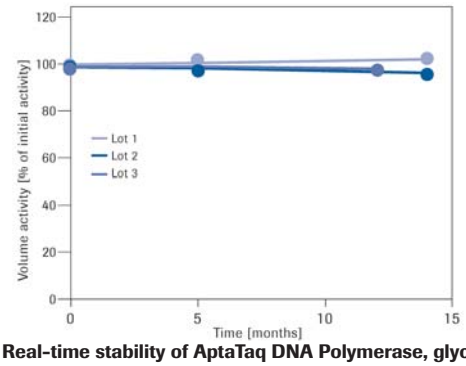
Benefits

- **Reduce time to result.** Save up to 15 minutes per run by omitting the initial activation step required by chemically modified hot start polymerases, and reduce cycling time with fast protocols.
- **Maximize specificity, sensitivity, and yield.** Achieve reliable amplification of your target DNA from various sources (*e.g.,* genomic DNA, cDNA, plasmids).
- **Simplify PCR setup.** Store these highly stable polymerase for up to 1 month at +2° to +8°C and setup your hot start PCR reaction at room temperature.
- **Obtain consistent results.** Roche standardized manufacturing processes include extensive Quality Control release testing for high lot-to-lot consistency ideal for (IVD) kit manufacturers and end users.
- **Prepare stable amplification mixes in dry format.** Use this formulation for producing dried-down amplification mixes stable at room temperature.

Cat. No.	Pack Size
05 187 605 103	custom fill

Will be supplied as "AptaTaq DNA Pol., Glycerol-free, 50 U/ul". Unit of Measure is "kU".

DRY ICE



Real-time stability of AptaTaq DNA Polymerase, glycerol-free, 50 U/µl.
Volume activity was determined by a radioactive test after storage at -20°C for different time periods, starting at 100%. AptaTaq DNA Polymerase can be stored in the freezer for more than 15 months without any activity loss.

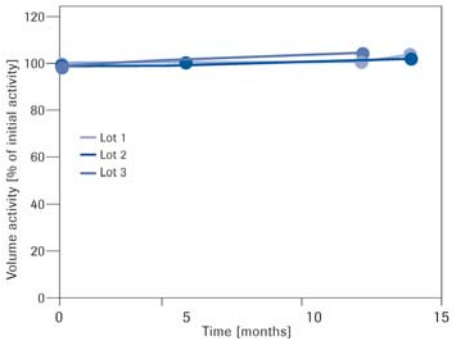
Product Description
AptaTaq DNA Polymerase is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) providing hot start features. The concentrated formulation does not contain glycerol and is suitable for the preparation of dry amplification mix preparations.

EC 2.7.7.7

Properties
AptaTaq DNA Polymerase is active at temperature above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly processive 5'-3' DNA Polymerase that lacks 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. The inherent stability of Taq DNA Polymerase is shown by the high storage stability in refrigerator and freezer (24 months at +2 to +8°C and -25 to -25°C). Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/l)
dNTP requirement: Approximately 200 µmol/l for each dNTP

Specification
Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µl
Glycerol content: ≤0.1% (v/v)
Aptamer concentration (HPLC): 35.75 µmol/l ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
See ***AptaTaq DNA Polymerase, 5 U/µl***



Real-time stability of AptaTaq DNA Polymerase, glycerol-free, 50 U/µl.
Volume activity was determined by a radioactive test after storage at +4°C for different time periods, starting at 100%. AptaTaq DNA Polymerase can be stored in the refrigerator for more than 15 months without any activity loss.

For further processing only.

Patent and License Disclaimer(s): 63

AptaTaq DNA Polymerase LDx, 5 U/µl
from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Cat. No.	Pack Size
05 884 314 103	custom fill

Taq DNA Polymerase with novel hot start system and extremely low DNA background for maximum sensitivity, speed and robustness in liquid assay formulations.

Application
Select AptaTaq DNA Polymerase LDx to perform microbial testing and other assays where the absence of contaminating bacterial, fungal, and/or human DNA is crucial. AptaTaq DNA LDx Polymerase is ideal for:
- Fast PCR assays with no extra enzyme activation time and fast cycling protocols

Will be supplied as "AptaTaq DNA Polymerase LDx, 5 U/µl". Unit of Measure is "kU".
For further processing only.

Patent and License Disclaimer(s): 63

- Single- and multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- RT-PCR
- Difficult templates with secondary structures or GC-rich sequences
- Automated PCR workflows requiring high stability of the reaction mixtures during automated pipetting and prolonged handling at room temperature

Benefits

- **Minimize risks from contaminating nucleic acids.** AptaTaq DNA Polymerase LDx is extensively tested using ultra sensitive tests for contaminating nucleic acids from bacteria and fungi.
- **Rely on sophisticated manufacturing practices.** Roche has developed a nucleic acid-free workflow with clearly defined, highly consistent manufacturing processes to offer a product with very low nucleic acid background.
- **Enjoy the benefits of the advanced AptaTaq hot start system.** Use AptaTaq DNA Polymerase for additional benefits including speed, easy handling and consistent results.

Product Description

AptaTaq DNA Polymerase LDx is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) with hot start features, optimized for applications detecting lowest levels of DNA.

EC 2.7.7.7

Properties

AptaTaq DNA Polymerase LDx is active at temperature above +60 to +65°C and inactive below +55°C. This hotstart feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly processive 5'-3' DNA Polymerase that lacks 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/l)
dNTP requirement: Approximately 200 µmol/l for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C
Volume activity: 5.5±0.5 U/µl
Aptamer concentration (HPLC): 3.6 µmol/l ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Tests for the absence of contaminating nucleic acids
(human genomic DNA, β-Globin fragment): Corresponds to specification
(LightCycler® UniTOOL ResoLight assay, detecting grampositive and gramnegative bacterial
DNA and fungal DNA, <1 genome equivalent/20 U enzyme): Corresponds to specification
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human

genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Quality

AptaTaq DNA Polymerase LDx quality contains a very low DNA background, verified using an ultra-sensitive LightCycler® assay for the absence of gram(+), gram(-) bacteria, and fungal DNA. To pass this Quality Control test, the level of contaminating nucleic acid must be <1 genome equivalent per 20 units of DNA polymerase. Furthermore, AptaTaq DNA Polymerase LDx is analyzed for the absence of contaminating human DNA using a LightCycler® test specific for β-globin.

Background Information

Contaminating nucleic acids from various sources can affect PCR due to non-specific amplification, leading to reduced sensitivity and specificity, and false positive results. To minimize the risk of contamination and provide a product with very low nucleic acid background, Roche developed a nucleic acid-free workflow with defined, consistent manufacturing processes and ultra-sensitive quality control methods:

- Our raw materials have reduced DNA content.
- All equipment, buffers, and solutions are decontaminated.
- Highly trained staff and dedicated rooms ensure clean production.
- Remaining traces of DNA contamination are removed using chromatography.
- The final product is extensively characterized and tested for the absence of contaminating DNA.

For additional information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq DNA Polymerase LDx, 50 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, glycerol-free solution

Taq DNA Polymerase with novel hot start system and extremely low DNA background for maximum sensitivity, speed and robustness. High concentration for dried-down amplification mixes and processing.

Application

Select AptaTaq DNA Polymerase LDx to perform microbial testing and other assays where the absence of contaminating bacterial, fungal, and/or human DNA is crucial. AptaTaq DNA LDx Polymerase is ideal for:

- Fast PCR assays with no extra enzyme activation time and fast cycling protocols
- Single- and multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- RT-PCR
- Difficult templates with complex secondary structures or GC-rich sequences
- Formulation of dried-down amplification reagents

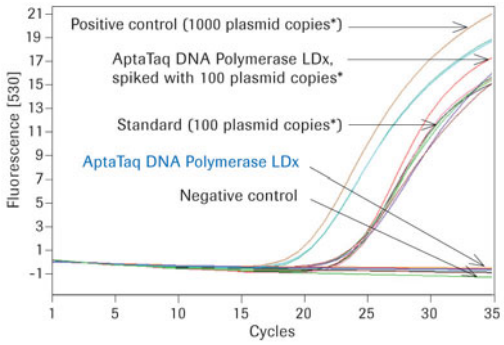
Benefits

- **Minimize risk of contaminating nucleic acids.** AptaTaq DNA Polymerase LDx is extensively evaluated using ultra sensitive tests for detecting contaminating nucleic acids from bacteria and fungi.
- **Rely on high quality manufacturing practices.** Roche has developed a nucleic acid-free workflow with clearly defined, highly consistent manufacturing processes resulting in a product with very low nucleic acid background.

Cat. No.	Pack Size
05 447 895 103	custom fill

Will be supplied as "AptaTaq DNA Pol. LDx, Glyc.-free, 50 U/µl". Unit of Measure is "kU".

DRY ICE



LightCycler® UniTool ResoLight quality control release assay for AptaTaq DNA Polymerase LDx on a Real-Time PCR Instrument.
Test of thirty units of AptaTaq DNA Polymerase LDx, glycerol-free, 50 U/µl shows no contaminating gram(+) or gram(-) bacterial DNA or fungal DNA. The Quality Control release value is defined as <1 genome equivalent/20 units DNA polymerase.

For further processing only.

Patent and License Disclaimer(s): 63

DNA Polymerases, Hot Start

AptaTaq DNA Polymerase

- **Prepare stable amplification mixes in dry format.** Use this formulation for producing dried-down amplification mixes stable at room temperature.
- **Enjoy the benefits of the advanced AptaTaq hot start system.** Refer to AptaTaq DNA Polymerase for additional benefits like speed, easy handling and consistent results.

Product Description

AptaTaq DNA Polymerase LDx is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) with hot start features, optimized for applications detecting the lowest levels of DNA.

EC 2.7.7.7

Properties

AptaTaq DNA Polymerase LDx is active at temperature above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly processive 5'-3' DNA Polymerase lacking 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). This enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/l)
dNTP requirement: Approximately 200 µmol/l for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µl
Glycerol content: ≤0.1% (v/v)
Aptamer concentration (HPLC): 35.75 µmol/l ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +37°C.
Tests for the presence of contaminating nucleic acids
(human genomic DNA, β-Globin fragment): Corresponds to specification
(LC UniTool Resolight assay, specific for grampositive and gramnegative bacterial DNA and fungi DNA, <1 genome equivalent/20 U enzyme): Corresponds to specification
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Quality

LDx quality contains a very low DNA background, as verified using an ultrasensitive LightCycler® assay for the absence of gram(+), gram(-) bacteria, and fungal DNA. To pass this Quality Control test, the level of contaminating nucleic acid must be <1 genome equivalent per 20 units of DNA polymerase. Furthermore, it is analyzed for the absence of contaminating human DNA with a LightCycler® test, specific for β-globin.

Background Information

For information on LDx refer to ***AptaTaq DNA Polymerase LDx, 5 U/µl***
For additional information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Δexo DNA Polymerase, 5 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

N-terminal truncated Taq DNA Polymerase with novel hot start system and no 5'-3' exonuclease activity for optimal detection of mismatches, speed and robustness in liquid assay formulations.

Application

Use AptaTaq Δexo DNA Polymerase for:

- SNP analysis and genotyping
- Allele-specific PCR
- Multiplexing
- Arbitrarily primed PCR
- Automated PCR requiring prolonged handling at room temperature

When time to result matters, this novel hot start technology is ideal as it does not require any activation time.

Benefits

- **Optimize your SNP analysis.** Discriminate between paired and unpaired primer ends using an enzyme optimized for allele-specific PCR.
- **Obtain reliable results fast.** Benefit from the general features of the AptaTaq DNA Polymerase System with the differentiating capabilities of a 5'-3' exonuclease activity-lacking Taq DNA Polymerase.

Product Description

This novel optimized mixture of high-quality N-terminal-deleted Taq DNA Polymerase and a specific oligonucleotide (aptamer) provides improved discrimination against misextension. As with the AptaTaq DNA Polymerase System, the AptaTaq Δexo DNA Polymerase-based assay shows high specificity and a broad dynamic range of products.

EC 2.7.7.7

Properties

AptaTaq Δexo DNA Polymerase is active at temperature above +60 to +65°C and inactive below +55°C. This hotstart feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly processive 5'-3' DNA Polymerase that lacks 5'-3' and 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 8.3 (+20°C)
Temperature optimum for elongation: Approximately +72°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 2 mmol/l)
dNTP requirement: Approximately 200 µmol/l for each dNTP

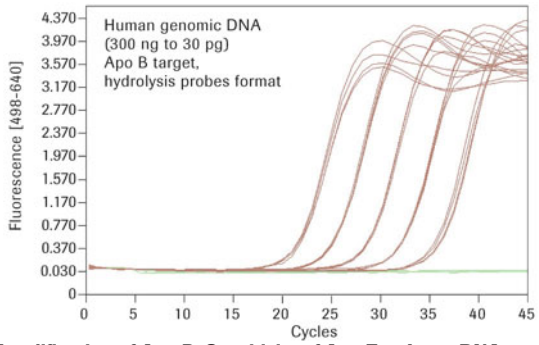
Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C
Volume activity: 5.5±0.5 U/µl

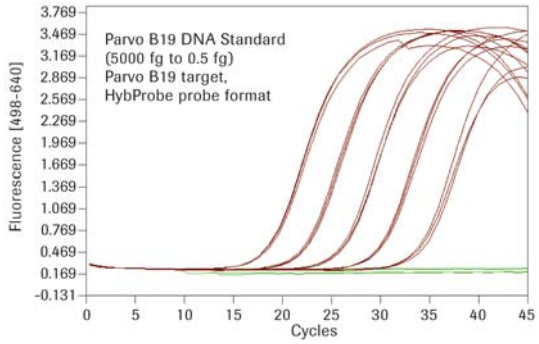
Cat. No.	Pack Size
05 458 030 103	custom fill

Will be supplied as "AptaTaq delta exo DNA Polymerase, 5 U/µl". Unit of Measure is "kU".

DRY ICE



Amplification of Apo B: Sensitivity of AptaTaq Δ exo DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument.
Thermal cycling conditions: Denaturation: 30 seconds at 95°C. Amplification: 5 seconds at 95°C, 15 seconds at 60°C, 10 seconds at 72°C, 45 cycles. Cooling: 60 seconds at 40°C.



Amplification of Parvo B19: Sensitivity of AptaTaq Δ exo DNA Polymerase, 5 U/µl, on a Real-Time PCR Instrument.
Thermal cycling conditions: Denaturation: 30 seconds at 95°C. Amplification: 5 seconds at 95°C, 15 seconds at 60°C, 10 seconds at 72°C, 45 cycles. Cooling: 60 seconds at 40°C.

For further processing only.

Patent and License Disclaimer(s): 63

Aptamer concentration (HPLC): 24.0 µmol/l ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
See ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Δexo DNA Polymerase, 50 U/µl
from *Thermus aquaticus* BM, expressed in *E. coli*, glycerol-free solution

Cat. No.	Pack Size
05 364 086 103	custom fill

Will be supplied as "AptaTaq delta exo DNA Pol., Glyc.-free". Unit of Measure is "kU".

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 63

N-terminal truncated Taq DNA Polymerase with novel hot start system, and no 5'-3' exonuclease activity, for optimal detection of mismatches, speed and robustness. High concentration for dried-down amplification mixes and processing.

Application
Use AptaTaq Δexo DNA Polymerase for:
- SNP analysis and genotyping
- Allele-specific PCR
- Multiplexing
- Arbitrarily primed PCR
- Formulation of dried-down amplification reagents

When time to result matters, this novel hot start technology is ideal as it does not require any activation time.

Benefits
- **Optimize your SNP analysis.** Discriminate between paired and unpaired primer ends using an enzyme optimized for allele-specific PCR.
- **Obtain reliable results fast.** Benefit from the general features of the AptaTaq DNA Polymerase System with the discriminating capabilities of a 5'-3' exonuclease activity-lacking Taq DNA Polymerase.
- **Prepare stable amplification mixes in dried-down format.** Use this formulation for producing dried-down amplification mixes stable at room temperature.

Product Description
AptaTaq DNA Δexo Polymerase is a blend of N-terminal truncated Taq DNA Polymerase and a specific oligonucleotide (aptamer) with hot start features, optimized for excellent discrimination against misextension. This concentrated formulation contains no glycerol and is suitable for the preparation of dried-down amplification mix preparations.

EC 2.7.7.7

Properties
AptaTaq ΔexoDNA Polymerase is active at temperatures above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of non-specific primer extension. Taq DNA Polymerase itself is a highly processive 5'-3' DNA Polymerase lacking 5'-3' and 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately

9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 8.3 (+20°C)
Temperature optimum for elongation: Approximately +72°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 2 mmol/l)
dNTP requirement: Approximately 200 µmol/l for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Casein 1 g/l; glycerol-free; pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µl
Aptamer concentration: 240 µmol/l ±10% (HPLC)
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Function test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background Information

See ***AptaTaq DNA Polymerase, 5 U/µl***

EagleTaq DNA Polymerase, 5 U/µL

from *Thermus aquaticus*, expressed in *E. coli*, solution

EagleTaq DNA Polymerase is a chemically modified hot start DNA polymerase.

Application

Apply EagleTaq DNA Polymerase for:

- Hot start activated amplification
- Incorporation of modified nucleotides for generating labeled PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green

Benefits

- Obtain high specificity, sensitivity, and yield for genomic targets.
- Simplify PCR setup for automation by using hot start activation at +95°C with a chemically modified enzyme.
- Rely on lot-to-lot consistency and full traceability with GMP manufacturing.
- Control carryover contamination with a dUTP and Uracil-DNA Glycosylase treatment (UNG) compatible setup.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Tween 20, 0.5% (v/v); glycerol, 50.0% (v/v); pH approximately 9.0 at +20°C
Volume activity: 5.4–5.9 U/µl
Function test: At least $1.5x10^5$ fold amplification of λDNA after 25 cycles. One band at 500 bp on an agarose gel.
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
05 206 944 190	1 kU
05 206 952 190	25 kU

05206944190: Will be supplied as "CMPNT EAGLETAQ 1 KU, 5U/uL 0.2mL". Unit of Measure is "piece".
05206952190: Will be supplied as "CMPNT EAGLETAQ 25 KU, 5U/uL 5mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 64

FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

FastStart Taq DNA Polymerase enables specific and sensitive amplification of DNA fragments in a hot start polymerase chain reaction (PCR) with activation of the enzyme in the initial heat denaturation phase.

Application

Use FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl, for:

- Hot start PCR and RT-PCR with high specificity, sensitivity and yield
- Specific amplification of DNA fragments from various sources of DNA and for diverse down-stream applications
- Labeling of DNA with modified nucleotides (*e.g.,* DIG-dUTP, biotin-dUTP, fluorescein-dUTP)
- The prevention of carryover contamination between PCR reactions in combination with dUTP and Uracil-DNA Glycosylase
- Manufacture of amplification mixtures for regulated applications (*e.g., in vitro* diagnostics, quality control) with requests for more stringent validation

Benefits

- **Maximize specificity and target yield.** Minimize the extension of non-specifically bound primers using this hot start reaction that maximizes the amplification of specific product.
- **Achieve highest sensitivity.** Prevent nonspecific priming and detect amplification product from as little as one copy of your target DNA.
- **Simplify PCR setup.** Pipette and handle the hot start reaction mix at ambient temperature.
- **Simplify assay design.** Create robust PCR assays with a minimum of optimization efforts also suited for multiplex PCR applications.
- **Obtain reliable results.** Rely on the robust reaction performance, and high lot-to-lot consistency of this product, thoroughly tested for a reproducible quality. Manufacturing and documentation are according to GMP (Good Manufacturing Practice) regulations.

EC 2.7.7.7

Properties

FastStart Taq DNA Polymerase is designed for hot start PCR and has to be heat-activated in the beginning of the reaction protocol.
Enzyme acivities: Highly processive 5'-3' DNA polymerase; double-strand specific 5'-3' exonuclease; no 3'-5' exonuclease activity
Heat activation: +95°C for 3-10 minutes (assay-dependent; recommendation is 10 minutes for full activation)
pH optimum: Approximately 9.0 (+25°C)
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Substrates: Incorporates dNTP, dUPT, dITP, various labeled or modified nucleotides (200 µmol/l each is recommended of normal dNTP, increased concentrations of variants).
Divalent ion requirement: Mg^{2+} (1.5 mmol/l standard concentration)

Specification

Appearance: Clear, opalescent solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Tween 20, 0.2% (v/v); glycerol, 50% (v/v); pH 9.0±0.1 at +25°C
Volume activity: ≥5 U/µl
Unit definition: One unit Taq DNA Polymerase is defined as the amount of heat-activated enzyme that incorporates 10 nmol of total deoxyribonucleoside-triphosphates into acid precipitable DNA within 30 minutes at +75°C under

Cat. No.	Pack Size
04 659 163 103	5 kU

Will be supplied as "FastStart Taq DNA Pol. Ind. GMP Grd, 5KU".
Unit of Measure is "piece".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 49

For the best fit reaction buffer, use PCR Buffer, see page 256
For the best fit reaction buffer, use FastStart PCR Buffer, see page 238

standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Function test in PCR
(human genomic DNA, tPA gene): Corresponds to reference
(human genomic DNA, ApoE gene): Corresponds to reference
Function test in qPCR using the LightCycler® System
(human genomic DNA, β-globin gene): Corresponds to reference
(plasmid DNA, β-globin gene): Corresponds to reference
(reverse transcribed cDNA, PBGD gene): Corresponds to reference
Bioburden: ≤50 CFU/ml
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Background Information
FastStart Taq DNA Polymerase is a chemically inactivated form of recombinant Taq DNA Polymerase. It remains inactive at temperatures up to +75°C. At higher temperatures, the modification is cleaved off and the polymerase acquires its enzymatic activity. Using FastStart Taq DNA Polymerase, PCR setup can be done conveniently at ambient temperature with no risk of nonspecific priming. The polymerase will not be activated until the initial denaturation step of the PCR protocol, at which point nonspecific hybridization can no longer occur.

FastStart Taq DNA Polymerase, 5 U/µl
from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Cat. No.	Pack Size
12 161 508 103	custom fill

FastStart Taq DNA Polymerase enables specific and sensitive amplification of DNA fragments in a hot start polymerase chain reaction (PCR) with activation of the enzyme in the initial heat denaturation phase.

Application
For applications see ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

Benefits
See benefits of ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

EC 2.7.7.7

Properties
See ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

Specification
Appearance: Clear, opalescent solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Tween 20; 0.2% (v/v); glycerol, 50% (v/v); pH approximately 9.0 at +25°C
Volume activity: ≥5 U/µl
Unit definition: One unit Taq DNA Polymerase is defined as the amount of heat-activated enzyme that incorporates 10 nmol of total deoxyribonucleoside-triphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDN): Not detectable in up to 25 U after 16

Will be supplied as "Fast Start Taq DNA Polymerase". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 49

For the best fit reaction buffer, use PCR Buffer, see page 256
For the best fit reaction buffer, use FastStart PCR Buffer, see page 238

hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Exonucleases (calf thymus DNA): Not detectable in up to 15 U after 4 hours incubation at +65°C.
Function test in PCR
(50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to reference
(200 ng human genomic DNA, 284 bp ApoE fragment): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
See ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

FastStart Taq DNA Polymerase, 100 U/µl
from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Cat. No.	Pack Size
04 433 785 103	custom fill

Will be supplied as "FastStart Taq DNA Pol. 100 U/µl". Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 49

FastStart Taq DNA Polymerase enables specific and sensitive amplification of DNA fragments in a hot start polymerase chain reaction (PCR) with activation of the enzyme in the initial heat denaturation phase.

Application
Use FastStart Taq DNA Polymerase, 100 U/µl, especially for:
- Setup of PCR master mixtures, when highly concentrated components are requested
- Preparation of stabilized dried-down formulations of reaction mixtures

For further applications, see ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

Benefits
See benefits of ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

EC 2.7.7.7

Properties
See ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

Specification
Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; Tween 20, 0.2% (v/v); glycerol, 50% (v/v); pH 9.0 at +25°C ±0.1
Volume activity: ≥100 U/µl
Unit definition: One unit Taq DNA Polymerase is defined as the amount of heat-activated enzyme that incorporates 10 nmol of total deoxyribonucleoside-triphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 15 U after 4 hours incubation at +65°C.

Function test in PCR
(human genomic DNA, tPA gene): Corresponds to reference
(human genomic DNA, ApoE gene): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
See ***FastStart Taq DNA Polymerase, GMP Grade, 5 U/µl***

FastStart PCR Buffer
10x conc., with 20 mM $MgCl_2$

Standard reaction buffer for PCR using FastStart Taq DNA Polymerase.

Application
Use this buffer together with FastStart Taq DNA Polymerase. For applications refer to ***FastStart Taq DNA Polymerase, 5 kU, GMP Grade.***

Benefits
- **Simplify PCR setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible PCR experiments.
- **Gain better performance.** Take full advantage of FastStart Taq DNA Polymerase using a reaction buffer specially optimized for this enzyme.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 50 mmol/l; KCl, 100 mmol/l; $MgCl_2$, 20 mmol/l; pH approximately 8.3 at +25°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µl after 1 hour incubation at +37°C.
Function test in PCR (50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
12 161 567 103	1 ml
12 161 516 103	custom fill

12161516103: Will be supplied as "PCR buffer (10X) w MgCl2". Unit of Measure is "ml".
12161567103: Will be supplied as "FastStart PCR Buffer (10x), 1 ml". Unit of Measure is "piece".

DRY ICE

For further processing only.

FastStart PCR Buffer
10x conc., without $MgCl_2$

Standard reaction buffer without $MgCl_2$ for optimization of the $MgCl_2$ concentration in PCR using FastStart Taq DNA Polymerase.

Application
Use this buffer together with FastStart Taq DNA Polymerase whenever the amplification of difficult target requires a specific $MgCl_2$ concentration.

Benefits
- **Amplify difficult targets.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer with an optimized $MgCl_2$ concentration for best results.
- **Gain excellent performance.** Take full advantage of FastStart Taq DNA Polymerase using a reaction buffer specially optimized for this enzyme.

Specification
Appearance: Clear, colorless solution

Cat. No.	Pack Size
05 917 166 103	1 ml
12 161 494 103	custom fill

12161559103: Will be supplied as "PCR buffer (10xconc.) without MgCl MPB". Unit of Measure is "piece".
12161494103: Will be supplied as "PCR buffer (10X) w/o MgCl2". Unit of Measure is "ml".

DRY ICE

For further processing only.

Contents: Tris/HCl, 500 mmol/l; $(NH_4)_2SO_4$, 50 mmol/l; KCl, 100 mmol/l; pH approximately 8.3 at +25°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activitiy (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µl after 1 hour incubation at +37°C.
Function test in PCR (50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

HawkZ05 DNA Polymerase, 40 U/µl

from *Thermus* species Z05, expressed in *E. coli*, solution

The HawkZ05 DNA Polymerase is an one-step RT/PCR DNA polymerase.

Application

Apply HawkZ05 DNA Polymerase for:

- Efficient, high temperature cDNA synthesis and subsequent DNA amplification of RNA templates
- Use in multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- Incorporation of modified nucleotides for labeling of PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green
- Fast-cycling diagnostic applications and other routine amplification of low-copy targets

Benefits

- Obtain increased detection sensitivity using this highly specific one- or two-step RT-PCR method.
- Enjoy fast PCR cycling without RNA degradation by using this fast activating, reversible aptamer-based hot start method.
- Control carryover contamination with a dUTP and Uracil-DNA Glycosylase treatment (UNG) compatible setup.
- Rely on lot-to-lot consistency and full traceability with GMP manufacturing.
- Simplify setup of PCR reactions using this stable aptamer hot start DNA polymerase at room temperature.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Tween 20, 0.5% (v/v); glycerol, 50.0% (v/v); aptamer; pH approximately 8.0
Volume activity: 40-55 U/µl
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
05 230 322 190	5 kU
05 230 349 190	200 kU

05230322190: Will be supplied as "CMPNT HAWKZ05 DNA Polymerase 5KU 0.125mL". Unit of Measure is "piece".
05230349190: Will be supplied as "CMPNT HAWK Z05 DNA Polymerase 200KU 5mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 63

HawkTaq DNA Polymerase, 5 U/µL

from *Thermus aquaticus*, expressed in *E. coli*, solution

HawkTaq DNA Polymerase is a hot start DNA polymerase.

Application

Apply HawkTaq DNA Polymerase for:

- Fast-cycling diagnostic applications and other routine amplification of low-copy targets
- Use in multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- Incorporation of modified nucleotides for labeling of PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green

Benefits

- Enjoy increased specificity, sensitivity, and yield compared to non-hot start methods.
- Utilize fast PCR cycling with the fast activating, reversible aptamer-based hot start.
- Control carryover contamination with a dUTP and Uracil-DNA Glycosylase treatment (UNG) compatible setup.
- Rely on high lot-to-lot consistency and full traceability with GMP manufacturing.
- Simplify setup of PCR reactions using this highly stable enzyme at room temperature.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; EDTA, 0.1 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50.0% (v/v); aptamer; pH approximately 8.0
Volume activity: 5.0-6.6 U/µl
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
05 230 357 190	5 kU
05 230 365 190	125 kU

05230357190: Will be supplied as "CMPNT HAWK TAQ DNA Polymerase 5KU 1mL". Unit of Measure is "piece".
05320365190: Will be supplied as "CMPNT HAWK TAQ DNA Polymerase 125KU 25mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 63

AptaTaq DNA Master
5x concentrated

Ready-to-use, fast and robust 5x reaction mix with novel hot start technology for real-time and endpoint PCR, especially suited for high-throughput applications on a variety of system platforms and detection formats.

Application
Use the master mix to amplify targets efficiently with high specificity and sensitivity. The AptaTaq DNA Master is developed to match a broad range of applications. It is ideally suited for high-throughput applications with low reaction volume due to its 5x concentration and high stability at room temperature. In combination with appropriate dyes, it can be used on various instrument platforms for endpoint analysis and real-time PCR. Due to the use of dUTP, DNA carryover contamination can be prevented when adding Uracil-DNA Glycosylase (UNG).

Benefits
- **Use the PCR instrument of your choice.** Perform sensitive and efficient endpoint analysis and real-time PCR on a variety of platforms and formats.
- **Obtain results quickly.** Omit the enzyme activation and save up to 15 minutes per run.
- **Gain flexibility.** The 5x concentrated master mix allows you to vary reaction volumes and sample input for best results.
- **Benefit from high stability.** The master mix is stable during setup and in high-throughput instrument platform ready to be processed. The AptaTaq DNA Master can be kept in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance.

Product Description
AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix. It contains AptaTaq DNA Polymerase, reaction buffer including an optimized Mg^{2+} concentration, and a dNTP mix with dUTP instead of dTTP.

EC 2.7.7.7

Properties
The master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

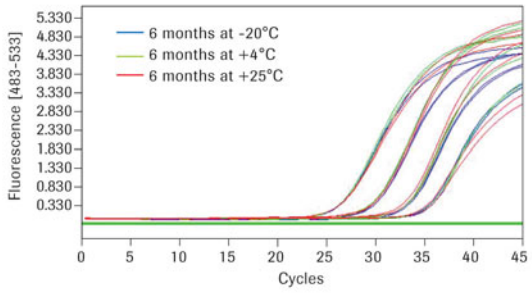
Specification
Appearance: Clear, colorless solution
Performance test in qPCR using ABI 7500:
(human genomic DNA, CycA fragment): Corresponds to specification
(human genomic DNA, β-globin fragment): Corresponds to specification
(human genomic DNA, ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Background Information
For information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

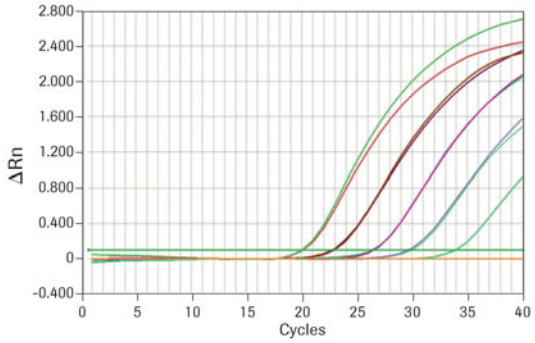
Cat. No.	Pack Size
05 537 533 103	custom fill

Will be supplied as "AptaTaq DNA Master". Unit of Measure is "ml".

DRY ICE



Storage stability of AptaTaq DNA Master.
Plasmid DNA from *Eurotium (Aspergillus) amstelodami* was detected in varying amounts (105 to 102 copies) using hydrolysis probes on a Real-Time PCR Instrument. AptaTaq DNA Master is stable for 6 months at +4°C and at least 4 weeks at +25°C.



Performance of AptaTaq DNA Master with FRET-ROX on an ABI 7500 real-time PCR Instrument.
To demonstrate its sensitivity, the AptaTaq DNA Master has been tested in combination with hydrolysis probes detecting a specific human single-copy gene on an ABI 7500 real-time PCR Instrument. The result shows a broad dynamic range down to 5 pg (approximately 2 copies).

For further processing only.

Patent and License Disclaimer(s): 63

AptaTaq DNA Master without Mg^{2+}
5x concentrated

Cat. No.	Pack Size
05 548 802 103	custom fill

Will be supplied as "AptaTaq DNA Master w/o Mg2+". Unit of Measure is "ml".

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 63

Ready-to-use, fast and robust 5x reaction mix without Mg^{2+}, using novel hot start technology for real-time and endpoint PCR, especially suited for high-throughput applications on various system platforms and detection formats.

Application
Use this master mix to optimize Mg^{2+} concentration. Since it does not contain Mg^{2+}, this master mix serves as basis for applications where a low Mg^{2+} concentration is required.

Benefits
- **Finetune AptaTaq DNA Master.** Use this master mix to optimize for best performance in your specific application.

Product Description
This master mix is identical to the AptaTaq DNA Master except that is does not contain Mg^{2+}. The master mix is also part of the AptaTaq DNA Master Optimization Kit.

EC 2.7.7.7

Properties
The master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

Specification
Appearance: Clear, colorless solution
Performance test in qPCR using ABI 7500:
(human genomic DNA, CycA fragment): Corresponds to specification
(human genomic DNA, β-globin fragment): Corresponds to specification
(human genomic DNA, ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Background Information
For information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq DNA Master Optimization Kit

Cat. No.	Pack Size
05 537 568 001	1 Kit for optimization of up to 750 reactions at 20 µl final reaction volume

Will be supplied as "AptaTaq DNA Master Optimization kit". Unit of Measure is "piece".

DRY ICE

Kit for the adaptation of the ready-to-use, fast and robust 5x AptaTaq DNA Master for a variety of real-time PCR system platforms and detection formats.

Application
Use AptaTaq DNA Master Optimization Kit to design a master mix with best performance in your application, and to optimize reagents for your real-time PCR system platform and detection format. For high-throughput applications, a custom AptaTaq DNA Master can be provided. Please contact your sales representative.

Benefits
- **Optimize your master mix to your needs.**
- **Maximize versatility.** Use FRET-ROX dye on ABI instruments.
- **Generate higher fluorescence signals.** Detect dsDNA with high sensitivity using the next-generation LightCycler® ResoLight dye.

Contents
01. AptaTaq DNA Master
02. AptaTaq DNA Master without Mg^{2+}, 5x concentrated
03. LightCycler® 480 ResoLight Dye
04. FRET-ROX Dye
05. $MgCl_2$ Stock Solution , 25 mmol/l
06. GC-RICH Solution, 5x concentrated
07. Water, PCR Grade

For life science research only. Not for use in diagnostic procedures.

Patent and License Disclaimer(s): 05

Product Description
The AptaTaq DNA Master Optimization Kit contains all reagents (except

assay-specific components, such as primers and template) for optimizing PCR assays with AptaTaq DNA Polymerase. LightCycler® ResoLight dye allows the detection of dsDNA in real time using an appropriate PCR instrument (*e.g.,* the LightCycler® 480 Instrument), or in gel electrophoresis after the PCR has finished. A special Rox reference dye (FRET-ROX) enables you to design assays for all available real-time PCR instruments in which the Rox reference dye is required for quantitative analysis.

EC 2.7.7.7

Specification

Contents/Appearance:
Bottle 1: AptaTaq DNA Master, 5x concentrated; clear, colorless solution
Bottle 2: AptaTaq DNA Master without Mg^{2+}, 5x concentrated; clear, colorless solution
Bottle 3: LightCycler® 480 ResoLight Dye; yellowish solution
Bottle 4: FRET-ROX Dye; slightly purple solution
Bottle 5: $MgCL_2$ Stock Solution , 25 mmol/l; clear, colorless solution
Bottle 6: GC-RICH Solution, 5x concentrated; clear, colorless solution
Bottle 7: Water, PCR Grade; clear, colorless solution
Performance test in qPCR using ABI 7500 (human genomic DNA, β-globin fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Background Information

For information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Genotyping Master

5x concentrated

Ready-to-use, fast and robust 5x reaction mix using novel hot start technology for high-throughput genotyping applications on real-time PCR instruments not requiring Rox normalization. Ideal PCR reagent mix for crude DNA extractions and robust against inhibitors.

Application

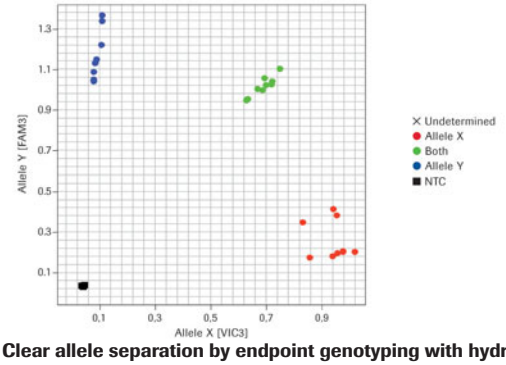
Use AptaTaq Genotyping Master in genotyping applications with all real-time PCR instruments that do not require Rox normalization. AptaTaq Genotyping Master is ideal for high-throughput applications using low reaction volumes. The master mix is very resistant to inhibitors and can be dried-down without loss of performance.

Benefits

- **Achieve results quickly.** Omit the enzyme activation and obtain results in less than half an hour.
- **Rely on a robust master mix.** Obtain reliable results from crude samples and even using low reaction volumes.
- **Ready for robotics.** Rely on the stability of the AptaTaq Genotyping Master mix for PCR automation. The viscosity of the master mix is optimized for accurate pipetting. The mix is stable during setup and on the stacker for more than 24 hours.
- **Gain flexibility.** The 5x concentrated master mix enables you to vary reaction volume and sample input for outstanding results. Use AptaTaq Genotyping Master mix for all real-time PCR instruments not requiring Rox normalization. For instruments requiring Rox normalization, use AptaTaq Genotyping Master (Rox).
- **Benefit from high stability.** Keep the master mix in the refrigerator for up to 4 weeks and profit from a quick setup without thawing first.

Cat. No.	Pack Size
05 955 807 103	10 ml for up to 5,000 reactions at 10 µl final reaction volume
05 890 152 103	custom fill

05955807103: Will be supplied as "AptaTaq Genotyping Master, 10ml". Unit of Measure is "piece".
05890152103: Will be supplied as "AptaTaq Genotyping Master". Unit of Measure is "ml".



Clear allele separation by endpoint genotyping with hydrolysis probes using low reaction volumes on a Real-Time PCR Instrument.
Wild type and mutant TGFß fragments were amplified using a 2-step protocol. Endpoint fluorescence was plotted in the VIC and FAM channels; reaction volume: 1 µl.

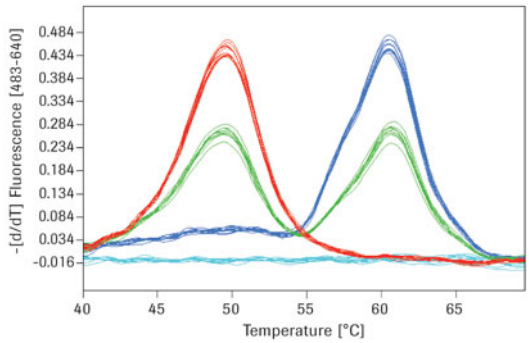
Product Description
AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix, containing AptaTaq DNA Polymerase in an optimized concentration for the amplification of difficult sample types, reaction buffer, and a dNTP mix using dUTP instead of dTTP (for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase).

EC 2.7.7.7

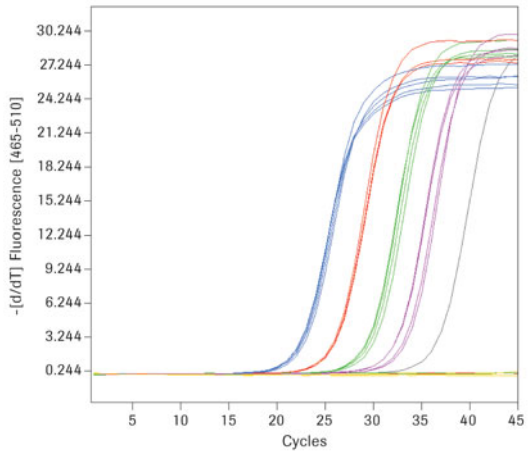
Properties
The master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

Specification
Appearance: Clear, colorless solution
Performance test in qPCR
(human genomic DNA, CycA fragment): Corresponds to specification
(human genomic DNA, β-globin fragment): Corresponds to specification
(human genomic DNA, ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
For information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***



SNP detection with HybProbe probes using a Real-Time PCR Instrument.
Different SNPs of human Factor II were genotyped by melting curve analysis after amplification using a 3-step real-time PCR protocol.



Robust amplification after DNA extraction that includes PCR inhibitors in crude plant material.
An *Arabidopsis* Gene E fragment was amplified by crude DNA extraction with chloroform and analyzed using a Real-Time PCR Instrument.

For further processing only.

Patent and License Disclaimer(s): 63

AptaTaq Genotyping Master (Rox)
5x concentrated

Ready-to-use, fast and robust 5x reaction mix with novel hot start technology for high-throughput genotyping applications on real-time PCR instruments requiring normalization with Rox. Ideal PCR reagent mix for crude DNA extractions and robust against inhibitors.

Application
Use AptaTaq Genotyping Master (Rox) in genotyping applications on instruments requiring normalization with Rox. AptaTaq Genotyping Master (Rox) is optimized for high-throughput applications using low reaction volumes. The master mix is very resistant to inhibitors and can be dried-down without loss of performance.

Benefits
- **Achieve results quickly.** Omit the enzyme activation and obtain results in less than half an hour.
- **Rely on a robust master mix.** Obtain reliable results from crude

Cat. No.	Pack Size
05 955 823 103	10 ml for up to 5,000 reactions at 10 µl final reaction volume
05 890 144 103	custom fill

05955823103: Will be supplied as "AptaTaq Genotyping Master (ROX), 10 ml". Unit of Measure is "piece".
05890144103: Will be supplied as "AptaTaq Genotyping Master (ROX)". Unit of Measure is "ml".
For further processing only.

Patent and License Disclaimer(s): 05, 63

samples even using low reaction volumes.
- **Ready for robotics.** Rely on the stability of the master mix for RT-PCR automation. The viscosity of AptaTaq Genotyping Master (Rox) is optimized for accurate pipetting. The mix is stable during setup and on the stacker for more than 24 hours.
- **Gain flexibility.** The 5x concentrated master mix allows you to vary reaction volume and sample input for best result. Use the same master mix for all types of real-time PCR instruments requiring Rox normalization.
- **Benefit from high stability.** Keep the master mix in the refrigerator for up to 4 weeks and profit from a quick setup without thawing first.

Product Description
AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix, containing AptaTaq DNA Polymerase in an optimized concentration for the amplification of difficult sample types, reaction buffer, and a dNTP mix with dUTP (for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase). The special Rox reference dye (FRET-ROX) enables you to run assays for all real-time PCR instruments in which Rox reference dye is required for quantitative analysis.

EC 2.7.7.7

Properties
The PCR master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

Specification
Appearance: Clear, slightly pink solution
Performance test in qPCR using ABI 7900
(human genomic DNA, CycA fragment): Corresponds to specification
(human genomic DNA, β-globin fragment): Corresponds to specification
(human genomic DNA, ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Background Information
For information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

EagleTaq Master Mix

Eagle Taq Master Mix is a real-time PCR master mix.

Application
Apply EagleTaq Master Mix for:
- Gene expression analysis of cDNA
- Efficient amplification of rare cDNA and low copy DNA targets
- Fast thermal cycling for high-throughput real-time PCR applications

Benefits
- Enjoy efficient detection of rare targets.
- Rely on the stability of this master mix in automation and high-throughput plate stacking handling.
- Obtain high yield and a robust 5' nuclease based detection through use of the robust EagleTaq DNA Polymerase enzyme.
- Run the master mix on a variety of real-time PCR platforms that do not require Rox as reference dye.

Cat. No.	Pack Size
05 529 069 190	1 ml
05 529 085 190	50 ml

05529069190: Will be supplied as "KIT EAGLETAQ MMX 1mL RUO". Unit of Measure is "piece".
05529085190: Will be supplied as "KIT EAGLETAQ MMX 50mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 64

- Minimize carryover PCR contamination with this 2x master mix containing dUTP, compatible with Uracil-DNA Glycosylase treatment (UNG).

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 18 and 28 cycles with starting template of 10 pg λDNA. Average CT value of test is within ±2 cycles of proven.
Stability: At -15 to -25°C within specification range for 12 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

EagleTaq Master Mix (Rox)

Eagle Taq Master Mix (Rox) is a real-time PCR master mix for systems requiring a reference dye.

Application

Apply EagleTaq Master Mix (Rox) for:
- Gene expression analysis of cDNA
- Efficient amplification of rare cDNA and low copy DNA targets
- Fast thermal cycling for high-throughput real-time PCR applications

Benefits

- Enjoy efficient detection of rare targets.
- Rely on the stability of this master mix in automation and high-throughput plate stacking handling.
- Obtain high yield and a robust 5' nuclease based detection through use of the robust EagleTaq DNA Polymerase enzyme.
- Run the master mix on a variety of real-time PCR platforms that require Rox as reference dye.
- Minimize carryover PCR contamination with this 2x master mix containing dUTP, compatible with Uracil-DNA Glycosylase treatment (UNG).

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 18 and 28 cycles with starting template of 10 pg λDNA. Average CT value of test is within ±2 cycles of proven.
Stability: At -15 to -25°C within specification range for 12 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
05 529 034 190	1 ml
05 529 026 190	50 ml

05529034190: Will be supplied as "KIT EAGLETAQ MMX WITH ROX 1mL RUO". Unit of Measure is "piece".
05529026190: Will be supplied as "KIT EAGLETAQ MMX WITH ROX 50mL". Unit of Measure is "piece".
For further processing only.

Patent and License Disclaimer(s): 64

FastStart PCR Master

2x concentrated

Good value master (2x) for reliable results on block cycler systems and simple real-time monoplex applications.

Application

Use FastStart PCR Master for block cycler applications and for simple real-time monoplex applications. Containing the FastStart enzyme as hot start polymerase, mispriming by-products can be avoided in a broad range of applications.

Benefits

- **Profit from high cost-to-profit value.**
- **Avoid mispriming by-products using hot start enzymes.** Containing the FastStart enzyme as a hot start polymerase with a specially formulated buffer system, the master mix is ideally suited to avoid unwanted mispriming by-products in your PCR reaction.
- **Obtain fast results.** Profit from the speed of the master which allows fast cycling protocols.

Product Description

FastStart PCR Master is a ready-to-use, 2x concentrated master mix containing all reagents (except primers, probes, and template) required for block cycler assays and simple real-time RNA-detection assays, using either hydrolysis probe detection or HybProbe format. The FastStart PCR Master effectively suppresses mispriming by-products.

EC 2.7.7.7

Properties

Activation time (during initial PCR denaturation step): ≥2 minutes at +95°C
Temperature optimum for elongation:
Fragment length <3 kb: +72°C
Fragment length >3 kb: +68°C
The master mix can be stored in the refrigerator (+2 to +8°C) for at least 1 week without loss of activity and performance. It is stable at room temperature for at least one day.

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 100 mmol/l; KCl, 20 mmol/l; $(NH_4)_2SO_4$, 10 mmol/l; $MgCl_2$, 4 mmol/l; dATP, dCTP, dGTP, dTTP (each 0.4 mmol/l)
pH value: 8.3±0.1 at +25°C
Volume activity: ≥50 U/ml
Unspecific endonucleases (λDNA and MWM II DNA): Not detectable in up to 25 µl after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 6 µl after 4 hours incubation at +37°C and +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 µl after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 µl after 1 hour incubation at +37°C
Performance test in PCR
(50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to specification
(2 ng human genomic DNA, 1.1 kb collagen fragment): Corresponds to specification
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Background Information

For information on the FastStart hot start system, see ***FastStart DNA Polymerase***

Cat. No.	Pack Size
04 659 155 103	custom fill

Will be supplied as "FastStart PCR Master IB". Unit of Measure is "ml".
For customized FastStart PCR Masters (*e.g.,* with dUTP), please inquire.

DRY ICE

For further processing only.

Patent and License Disclaimer(s): 49

AMV Reverse Transcriptase, recombinant, GMP Grade

from Avian Myeloblastosis Virus, expressed in *E. coli*

AMV Reverse Transcriptase, recombinant, GMP Grade, transcribes RNA fragments up to 12 kb, providing high sensitivity in conjunction with high thermostability.

Application

Use AMV Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA for:

- Two-step RT-PCR applications for amplification from RNA targets
- RT-PCR for detection of viral RNA
- TMA and NASBA nucleic acid amplification methods
- Synthesis of full-length cDNA for libraries or cloning
- Rapid amplification of cDNA end (RACE)
- Manufacture of amplification mixtures for applications with regulatory requirements (*e.g., in vitro* diagnostics, quality control)

Benefits

- **Achieve high sensitivity.** Use AMV Reverse Transcriptase for high sensitive RT-PCR applications in conventional thermal cyclers and real-time PCR instruments.
- **Obtain more full-length transcripts up to 12 kb.** Generate cDNA libraries with large inserts.
- **Reverse transcribe difficult templates.** Make use of the increased thermostability of this enzyme enabling reverse transcription at elevated temperatures to overcome RNA secondary structures (*e.g.,* in GC-rich RNA templates) and achieve optimal reaction conditions for specific cDNA synthesis.
- **Efficiently label cDNA.** DIG-, biotin-, or dye-labeled nucleotides can be incorporated during cDNA synthesis.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to GMP (Good Manufacturing Practice) regulations.

EC 2.7.7.49

Properties

AMV Reverse Transcriptase, recombinant, GMP Grade, provides higher thermostability compared to the native forms of AMV or M-MLV reverse transcriptase, allowing higher temperatures for reverse transcription, thus achieving better performance with GC-rich RNA fragments and difficult secondary structures.
Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, unwinding activity, RNase H (degrading RNA in RNA:DNA hybrids)
Recommended reaction temperature: +42 to +65°C
Substrates: Incorporates dNTP, ddNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Storage buffer: Potassium phosphate, 200 mmol/l; DTT, 2 mmol/l; Triton X-100, 0.2% (v/v); glycerol, 50% (v/v); pH approximately 7.2
Volume activity: ≥20 U/µl
Specific activity: ≥50 kU/mg protein
Unit definition: One unit AMV Reverse Transcriptase, recombinant, GMP Grade, is defined as the amount of enzyme which incorporates 1 nmol of [^{3}H] TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x$(dT)_{15}$

Cat. No.	Pack Size
03 203 166 103	20 kU
	200 kU

Will be supplied as "Rev.Transcriptase, AMV rec.". Unit of Measure is "kU".
The enzyme is filled as 20 or 200 KU per vial. Specify in the order, which filling.
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use Transcriptor RT Buffer, see page 270

as substrate.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Function test in RT-PCR (human skeletal muscle total RNA, 10 kb dystrophin gene fragment): Corresponds to reference
Bioburden: ≤50 CFU/ml
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

M-MLV Reverse Transcriptase, GMP Grade
from Moloney Murine Leukemia Virus, expressed in *E. coli*

Cat. No.	Pack Size
04 707 486 103	200 kU

Will be supplied as "M-MLV RT Industrial GMP Grade, 200 KU".
Unit of Measure is "piece".
The enzyme is supplied without reaction buffer.
DRY ICE
For further processing only.

M-MLV Reverse Transcriptase generates full-length cDNA with high efficiency. It has a lower RNase H activity than AMV Reverse Transcriptase and lacks endonuclease activity.

Application
Use M-MLV Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA for:
- Two-step RT-PCR applications for amplification from RNA targets
- RT-PCR for detection of viral RNA
- TMA and NASBA nucleic acid amplification methods
- Synthesis of full-length cDNA for libraries or cloning
- Rapid amplification of cDNA end (RACE)
- Manufacture of amplification mixtures for applications with regulatory requirements (*e.g., in vitro* diagnostics, quality control)

Benefits
- **Achieve high sensitivity.** M-MLV Reverse Transcriptase lacks endonuclease activity and has much lower RNase H activity than AMV Reverse Transcriptase.
- **Obtain full-length transcripts up to 10 kb.** Generate cDNA libraries.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to GMP (Good Manufacturing Practice) regulations.

EC 2.7.7.49

Properties
M-MLV Reverse Transcriptase, GMP Grade, is highly processive and generates full length cDNA with high efficiency.
Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, low RNase H activity, no endonuclease activity
Recommended reaction temperature: +37°C
Substrates: Incorporates dNTP, ddNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+}

Specification
Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 25 mmol/l; NaCl, 100 mmol/l; DTT, 10 mmol/l; EDTA,

0.1 mmol/l; Triton X-100, 0.01% (v/v); glycerol, 50% (v/v); pH approximately 8.4
Volume activity: ≥200-300 U/µl
Specific activity: ≥100 kU/mg protein
Unit definition: One unit M-MLV Reverse Transcriptase, GMP Grade, is defined as the amount of enzyme which incorporates 1 nmol of [^{3}H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x(dT)$_{15}$ as substrate.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 100 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 100 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 200 U after 1 hour incubation at +37°C.
Bioburden: ≤50 CFU/ml
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Transcriptor Reverse Transcriptase
recombinant, expressed in *E. coli*

Cat. No.	Pack Size
03 531 252 103	custom fill

Will be supplied as "Transcriptor Bulk". Unit of Measure is "kU". The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use Transcriptor RT Buffer, see page 270

Transcriptor Reverse Transcriptase is the robust recombinant reverse transcriptase with thermostability up to +60°C, for transcription of RNA fragments up to 14 kb in two-step RT-PCR applications.

Application
Use Transcriptor Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA for:
- Two-step RT-PCR applications using conventional thermal cyclers or real-time PCR instruments
- RT-PCR for detection of viral RNA
- TMA and NASBA nucleic acid amplification methods
- Synthesis of full-length cDNA up to 14 kb for libraries or cloning
- Rapid amplification of cDNA end (RACE)

Benefits
- **Achieve high sensitivity.** Use Transcriptor Reverse Transcriptase for high sensitive RT-PCR applications in conventional thermal cyclers and real-time PCR instruments.
- **Obtain more full-length transcripts up to 14 kb.** Generate cDNA libraries with large inserts.
- **Reverse transcribe difficult templates.** Make use of the increased thermostability of this enzyme enabling reverse transcription at elevated temperatures to overcome RNA secondary structures (*e.g.,* in GC-rich RNA templates), and achieve optimal reaction conditions for specific cDNA synthesis.
- **Efficiently label cDNA.** DIG-, biotin-, or dye-labeled nucleotides can be incorporated during cDNA synthesis.

EC 2.7.7.49

Properties
Transcriptor Reverse Transcriptase offers higher thermostability compared to the native forms of AMV or M-MLV reverse transcriptase, allowing higher temperatures for reverse transcription, achieving high performance with GC-rich RNA fragments and difficult secondary structures.
Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, unwinding activity, RNase H (degrading RNA in RNA:DNA

hybrids)
Recommended reaction temperature: +42 to +65°C
Substrates: Incorporates dNTP, ddNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Storage buffer: Potassium phosphate, 200 mmol/l; DTT, 2 mmol/l; Triton X-100, 0.2% (v/v); glycerol, 50% (v/v), pH approximately 7.2
Volume activity: ≥20 U/µl
Specific activity: ≥50 kU/mg protein
Unit definition: One unit Transcriptor Reverse Transcriptase is defined as the amount of enzyme which incorporates 1 nmol of [^{3}H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x(dT)15 as substrate.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 U after 4 hours incubation at +37°C. **Function test in RT-PCR** (human skeletal muscle total RNA, 10 kb dystrophin gene fragment): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® instrument (PBGD gene fragment from RNA standards): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Transcriptor RT Buffer

5x concentrated

Standard reaction buffer for Transcriptor Reverse Transcriptase.

Application

Use Transcriptor RT Buffer as an optimized reaction buffer for Transcriptor Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA.

Benefits

- **Simplify reaction setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible experiments.
- **Achieve excellent performance.** Take full advantage of Transcriptor Reverse Transcriptase using a reaction buffer specially optimized for this enzyme.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 250 mmol/l; KCl, 150 mmol/l; $MgCl_2$, 40 mmol/l; pH approximately 8.5 at +25°C
Unspecific endonucleases (MWM III DNA): Not detectable after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable after 4 hours incubation at +37°C.
Function test in 2-step RT-PCR (human total RNA, 10 kb dystrophin gene fragment): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® Instrument (RNA standards, PBGD gene fragment): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
03 531 325 103	1 ml

Will be supplied as "Transcriptor RT Buffer". Unit of Measure is "piece".

DRY ICE

For further processing only.

AllStart RNA Master

High-end one-step RT-PCR master mix (2x) for high sensitivity and assay robustness.

Application

Use AllStart RNA Master for all one-step RNA PCR applications using instruments not requiring normalization with Rox. Due to its novel hot start system, AllStart RNA Master avoids mispriming by-products, making it ideal for multiplex assays with a large number of different primers. For high sensitivity, AllStart RNA Master is the one-step RT-PCR reagent mix of choice.

Benefits

- **Rely on a RT-PCR master mix suited for all target types.** The new hot start system avoids undesired by-products even for the most difficult targets.
- **Detect low abundant genes with ease.** Find that gene with less than 10 copies relying on AllStart Master's high sensitivity.
- **Obtain results quickly.** Profit from the fast RT-Step requiring only 3 to 10 minutes.
- **Ready for robotics.** Rely on the stability of the master mix ideal for RT-PCR automation. The viscosity of the master mix is optimized for accurate pipetting. AllStart Master mix is stable during setup and on the stacker for more than 12 hours.
- **Gain flexibility.** The AllStart Master mix concept allows you to use PCR instruments not requiring Rox normalization. AllStart RNA Master (Rox) is specifically for real-time PCR instruments requiring Rox normalization.

Product Description

AllStart RNA Master is a ready-to-use, 2x concentrated RT-PCR master mix containing all reagents (except primers, probes, and template) required for running quantitative, real-time RNA-detection assays in the hydrolysis probe detection format. AllStart RNA Master enables very sensitive detection and quantification of defined RNA sequences.

EC 2.7.7.7

Properties

This RT-PCR master mix can be stored in the refrigerator (+2 to +8°C) for at least 2 weeks without loss of activity and performance. It is stable at room temperature for at least one day.

Specification

Appearance: Clear, colorless solution
Performance test in qPCR
(human RNA, Rantes fragment, multiples reaction): Corresponds to specification
(human RNA, B2M fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 895 286 001	5 ml for up to 1,000 reactions at 10 µl final reaction volume
05 895 367 001	50 ml for up to 10,000 reactions at 10 µl final reaction volume

05895286001: Will be supplied as "AllStart RNA Master, 5 ml". Unit of Measure is "piece".
05895367001: Will be supplied as "AllStart RNA Master, 50 ml". Unit of Measure is "piece".

Contents

01.AllStart RNA Master Mix 2x concentrated
02.AllStart RNA Enzyme Mix 20x concentrated

05895286001: For life science research only. Not for use in diagnostic procedures.
05895367001: For further processing only.

Patent and License Disclaimer(s): 04

AllStart RNA Master (Rox)

High-end one-step RT-PCR master mix (2x) for high sensitivity and assay robustness.

Application

Use AllStart RNA Master (Rox) in all one-step RNA RT-PCR applications using instruments requiring normalization with Rox. Due to its novel hot start system, AllStart RNA Master (Rox) avoids mispriming by-products, making it ideal for multiplex assays with a large number of different primers. For high sensitivity, AllStart RNA Master (Rox) is the one-step RT-PCR master mix of choice.

Benefits

- **Rely on a RT-PCR master mix for all target types.** The new hot start system avoids undesired by-products even for the most difficult targets.
- **Detect low abundant genes with ease.** Find that gene with less than 10 copies due to AllStart RNA Master's high sensitivity.
- **Obtain results quickly.** Profit from the fast RT-Step requiring only 3 to 10 minutes.
- **Ready for robotics.** Rely on the stability of the master mix for RT-PCR automation. The viscosity of the master mix is optimized for accurate pipetting. AllStart RNA Master (Rox) mix is stable during setup and on the stacker for more than 12 hours.
- **Gain flexibility.** The AllStart RNA Master mix concept allows you to use PCR machines with or without Rox normalization. For real-time PCR not requiring Rox normalization, use AllStart RNA Master instead of AllStart RNA Master (Rox).

Product Description

AllStart RNA Master (Rox) is a ready-to-use, 2x concentrated RT-PCR master mix containing all reagents (except primers, probes, and template) required for running quantitative, real-time RNA-detection assays in the hydrolysis probe detection format. AllStart RNA Master (Rox) enables very sensitive detection and quantification of defined RNA sequences. A special Rox reference dye (FRET-ROX) enables you to run assays for all real-time PCR instruments in which Rox reference dye is needed for quantitative analysis.

EC 2.7.7.7

Properties

The RT-PCR master mix can be stored in the refrigerator (+2 to +8°C) for at least 2 weeks without loss of activity and performance. It is stable at room temperature for at least one day.

Specification

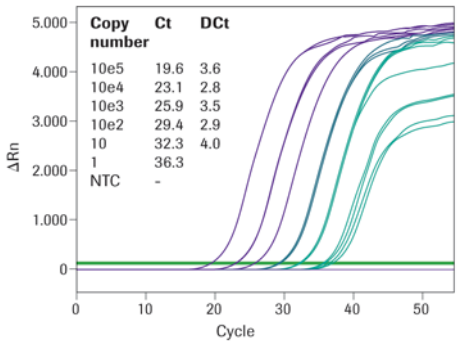
Appearance: Clear, colorless solution
Performance test in qPCR
(human RNA, Rantes fragment, multiples reaction): Corresponds to specification
(human RNA, B2M fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 999 375 001	5 ml for up to 1,000 reactions at 10 µl final reaction volume
05 895 359 001	50 ml for up to 10,000 reactions at 10 µl final reaction volume

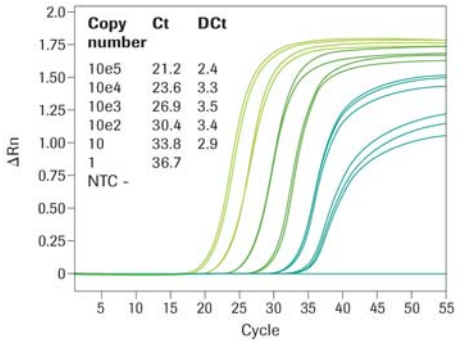
05999375001: Will be supplied as "AllStart RNA Master (ROX), 5 ml". Unit of Measure is "piece".
05895359001: Will be supplied as "AllStart RNA Master (ROX), 50 ml". Unit of Measure is "piece".

Contents

01. AllStart RNA Master Mix (Rox), 2x concentrated
02. AllStart RNA Enzyme Mix, 20x concentrated



Highly sensitive detection of influenza A virus over a broad range of copy numbers. A serial dilution from 10^5 to 1 copy of viral RNA was reversely transcribed and amplified in one-step reactions of a final volume of 10 µl in 384-well plates on the Applied Biosystems 7900 Real-Time PCR System. Copy numbers of 10^5 and 10^4 were investigated in duplicate, copy numbers of 10^3 and lower were performed in quadruplicate. The following detection profile was used: 50°C 10 minutes; 95°C 2 minutes 55x (95°C 15 seconds; 60°C 35 seconds). Reactions without templates (NTC) generated no detectable fluorescence.



Efficient detection of hepatitis A virus. A serial dilution from 10^5 to 1 copy of hepatitis A viral RNA was reversely transcribed and amplified in one-step reactions of a final volume of 20 µl in 96-well plates on the Applied Biosystems™ Real-Time PCR System. Copy numbers of 10^5 and 10^4 were investigated in duplicate, copy numbers of 10^3 and lower were performed in triplicate. The following detection profile was used: 50°C 10 minutes; 95°C 10 minutes; 55x (95°C 15 seconds; 60°C 35 seconds). Reactions without templates (NTC) generated no detectable fluorescence.

05999375001: For life science research only. Not for use in diagnostic procedures.
05895359001: For further processing only.

Patent and License Disclaimer(s): 04

HawkZ05 Fast One-Step RT-PCR Kit

HawkZ05 Fast One-Step RT-PCR Kit is a fast and robust, one tube, one enzyme RT-PCR reagent.

Application

Apply HawkZ05 Fast One-Step RT-PCR Kit for:

- High-throughput quantitative gene expression analysis
- Target detection and quantification
- Detection of rare transcripts
- Reverse transcription and amplification of RNA from limited samples

Benefits

- Enjoy increased specificity by employing hot start capability for both RT and PCR steps.
- Obtain reproducible detection of low copy numbers.
- Enjoy a broad dynamic range of eight logaritmic scales.
- Simplify the RT-PCR by using just one enzyme, buffer, and reaction step.
- Rely on this master mix for detection of target RNA with minor mismatches to primer sequences.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 20 and 30 cycles using starting template of $1x10^4$ copy pAW 109 per reaction. Average CT value of real-time PCR test is within ±2 cycles of the proven specification.
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 987 687 190	1 Kit 1x 5 ml master mix and 1x 1 ml Manganese acetate
05 987 695 190	1 Kit 2x 5 ml master mix and 2x 1 ml Manganese acetate

05987687190: Will be supplied as "KIT 1-STEP MMX W/ROX 1 x 5mL RUO". Unit of Measure is "piece".
05987695190: Will be supplied as "KIT 1-STEP MMX W/ROX 2 x 5mL LUO". Unit of Measure is "piece".

Contents

01. HawkZ05 Fast One-Step RT-PCR Master Mix
02. RMS Manganese Acetate (25 mM)

05987687190: For life science research only. Not for use in diagnostic procedures.
05987695190: For general laboratory use.

Patent and License Disclaimer(s): 65

dATP, PCR Grade
sodium salt, 100 mM

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTPs from the leading manufacturer of nucleotides.

Application
dATP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
dATP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 1927-31-7

Properties
Nomenclature: 2'-Deoxy-adenosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{12}P_3$
Molecular weight: 491.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
dATP (1 µmol ≙ 15.0 A_{260} units, pH 7.0): 100–110 mmol/l
dATP (high resolution HPLC method): ≥99 area%
dADP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.78±0.02
A_{280}/A_{260}: 0.15±0.01
A_{290}/A_{260}: ≤0.02
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
04 631 056 103	20 ml (2,000 µmol)
11 889 516 103	100 ml (10,000 µmol)

04631056103: Will be supplied as "dATP PCR Grade, Sodium Solution, 20 ml". Unit of Measure is "µmol".
11889516103: Will be supplied as "dATP,Na, Solution, (PCR Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

dCTP, PCR Grade
sodium salt, 100 mM

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTPs from the leading manufacturer of nucleotides.

Application
dCTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
dCTP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 2056-98-6

Properties
Nomenclature: 2'-Deoxy-cytidine-5'-triphosphate
Formula: $C_9H_{16}N_3O_{13}P_3$
Molecular weight: 467.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1-8.5
dCTP (1 µmol ≙ 9.6 A_{272} units, pH 7.0): 100-110 mmol/l
dCTP (high resolution HPLC method): ≥99 area%
dCDP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.82±0.02
A_{280}/A_{260}: 0.97±0.02
A_{290}/A_{260}: 0.30±0.02
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
04 631 072 103	20 ml (2,000 µmol)
11 889 508 103	100 ml (10,000 µmol)

04631072103: Will be supplied as "dCTP PCR Grade, Sodium Solution, 20 ml". Unit of Measure is "µmol".
11889508103: Will be supplied as "dCTP, Na, Solution (PCR Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

α-S-dCTP, Molecular Diagnostic Grade
S-isomer, sodium salt, 100 mM

Modified dCTP for Strand Displacement Amplification and other special applications.

Cat. No.	Pack Size
12 207 095 103	custom fill

Will be supplied as "Alpha-thio-d-CTP, Solution (Mol-DIA)". Unit of Measure is "µmol".

DRY ICE

Application
Use α-S-dCTP in alternative amplification technologies such as Strand Displacement Amplification (SDA). In addition, these nucleotides can be used in applications, including amplification reactions when a higher resolution in capillary electrophoresis is desired. This product is the purified S-isomer, prepared using Roche's biocatalytical production process. Use of purified S-isomer eliminates the introduction of another isomer which does not participate in the amplification reaction as it is not a substrate for the polymerase.

Benefits
- Use only the reactive isomer in your amplification reaction.

Product Description
α-S-dCTP, Molecular Diagnostic Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice.

Properties
Nomenclature: α-Thio-2'-deoxy-cytidine-5'-triphosphate
Formula: $C_9H_{16}N_3O_{12}SP_3 \times H_2O$
Molecular weight: 483.2 D

Specification
Appearance: Colorless solution
pH value: 8.1-8.5
α-S-d-CTP (1 µmol ≙ 9.6 A_{272} units): 90-100 mmol/l
α-S-d-CTP, S-Isomer (HPLC): ≥98.0 area%
α-S-d-CDP (HPLC): ≤1.5 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.80-0.84
A_{280}/A_{260}: 0.95-1.00
A_{290}/A_{260}: 0.28-0.32
Stability: At -15 to -25°C within specification range for 12 months.

Quality
This α-S-dCTP is the purified S-isomer, not a diastereomeric mixture.

For further processing only.

dGTP, PCR Grade
sodium salt, 100 mM

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTPs from the leading manufacturer of nucleotides.

Application
dGTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Cat. No.	Pack Size
04 631 129 103	20 ml (2,000 µmol)
11 889 524 103	100 ml (10,000 µmol)

04631129103: Will be supplied as "dGTP PCR Grade, Sodium Solution, 20 ml". Unit of Measure is "µmol".
11889524103: Will be supplied as "dGTP, Na, Solution (PCR Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

Product Description
dGTP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 2564-35-4

Properties
Nomenclature: 2'-Deoxy-guanosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{13}P_3$
Molecular weight: 507.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
dGTP (1 µmol ≙ 13.7 A_{252} units, pH 7.0): 100–110 mmol/l
dGTP (high resolution HPLC method): ≥99 area%
dGDP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 1.15±0.03
A_{280}/A_{260}: 0.67±0.02
A_{290}/A_{260}: 0.28±0.02
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

7-Deaza-2'-dGTP
lithium salt, 10 mM

Cat. No.	Pack Size
10 987 891 103	custom fill

Will be supplied as "7-Deaza-2'-deoxy-GTP, Di-Li". Unit of Measure is "µmol".

DRY ICE

For further processing only.

Use 7-Deaza-dGTP instead of dGTP in primer-extension reactions or PCR and receive a better resolution of GC-rich regions.

Application
Use 7-Deaza-dGTP as a substrate for most DNA polymerases, including Taq DNA polymerase.
7-Deaza-dGTP is used in the dideoxy-chain termination sequencing methods, in place of dGTP to overcome compression problems in gel electrophoresis when sequencing GC-rich stretches of DNA.

Benefits
- Achieve better sensitivity and resolution in primer-extension reactions.

Properties
Nomenclature: 7-Deaza-2'-deoxy-guanosine-5'-triphosphate
Formula: $C_{11}H_{17}N_4O_{13}P_3$
Molecular weight: 506.2 D

Specification
Appearance: Clear, colorless solution
pH value: 6.8–7.2
7-Deaza-2'-dGTP (1 µmol ≙ 13.4 A_{259} units): 10.0–11.0 mmol/l
7-Deaza-2'-dGTP (HPLC): ≥95 area%
7-Deaza-2'-dGDP (HPLC): ≤4 area%
A_{250}/A_{260}: 0.84±0.04
A_{280}/A_{260}: 0.65±0.03

A_{290}/A_{260}: 0.53±0.03
Stability: At -15 to -25°C within specification range for 30 months.

Background Information

Comparison of 7-Deaza-dGTP with dGTP and dITP showed that 7-Deaza-dGTP gives enhanced resolution compared with dGTP, resulting increased readability over long sequence regions compared with dITP. For sequencing reactions, dGTP is replaced by the same amount of 7-Deaza-dGTP in all four dideoxy-NTP solutions.
7-Deaza-dGTP performs equally well to all the other types of dideoxy sequencing and polymerization techniques. Partial substitution of 7-Deaza-dGTP for dGTP in PCR can improve the yield of reaction products for GC-rich templates containing strong secondary structures. Elimination of spurious GC-hydrogen bonding and relaxation of the secondary structure results in more efficient and specific PCR-product synthesis.
Incorporation of 7-Deaza-dGTP into DNA alters the fluorescent staining and electrophoretic mobility of the DNA.

dITP, PCR Grade

sodium salt, 100 mM

Cat. No.	Pack Size
12 158 124 103	100 ml (10,000 µmol)

Will be supplied as "Desoxy-ITP, Na-Lsg., (PCR-Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

High quality dITP from the leading manufacturer of nucleotides for the preparation of polynucleotides.

Application

dITP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. Use dITP for the preparation of poly(dI) x poly(dC) and poly[d(I-C)] with DNA polymerase and dCTP.

Benefits

- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

dITP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 95648-77-4

Properties

Nomenclature: 2'-Deoxy-inosine-5'-triphosphate
Formula: $C_{10}H_{15}N_4O_{13}P_3$
Molecular weight: 492.2 D

Specification

Appearance: Clear, colorless solution
pH value: 8.1-8.5
dITP (1 µmol ≙ 12.3 A_{249} units, pH 7.0): 100-110 mmol/l

dITP (high resolution HPLC method): ≥99 area%
dIDP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 1.67±0.03
A_{280}/A_{260}: 0.25±0.03
A_{290}/A_{260}: 0.03±0.02
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

---

dTTP, PCR Grade
sodium salt, 100 mM

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTPs from the leading manufacturer of nucleotides.

Application
dTTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
dTTP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 365-08-2

Properties
Nomenclature: 2'-Deoxy-thymidine-5'-triphosphate
Formula: $C_{10}H_{17}N_2O_{14}P_3$
Molecular weight: 482.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1-8.5
dTTP (1 µmol ≙ 9.5 A_{267} units, pH 7.0): 100-110 mmol/l
dTTP (high resolution HPLC method): ≥99 area%
dTDP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.64±0.02
A_{280}/A_{260}: 0.74±0.02

Cat. No.	Pack Size
04 631 137 103	20 ml (2,000 µmol)
11 889 559 103	100 ml (10,000 µmol)

04631137103: Will be supplied as "dTTP PCR Grade, Sodium Solution, 20 ml". Unit of Measure is "µmol".
11889559103: Will be supplied as "dTTP, Na, Solution (PCR Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

A_{290}/A_{260}: 0.24±0.02
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

dUTP, PCR Grade
sodium salt, 100 mM

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTPs from the leading manufacturer of nucleotides.

Application
dUTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. Avoid DNA carryover contamination between PCRs that can be a source of false positives.
To decontaminate PCR and RT-PCR mixes, dUTP is incorporated in place of dTTP into the PCR product. Reaction mixes are then pre-treated with Uracil-DNA Glycosylase (UNG) before amplification to degrade contaminating dUTP-containing PCR products.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Avoid false positive results.** Decontaminate your reaction mixes using Uracil-DNA Glycosylase before a new PCR amplification by incorporating dUTP instead of dTTP into PCR products.
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these nucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
dUTP, PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

CAS: 1173-82-6

Properties
Nomenclature: 2'-Deoxy-uridine-5'-triphosphate
Formula: $C_9H_{15}N_2O_{14}P_3$
Molecular weight: 468.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1-8.5
dUTP (1 µmol ≙ 9.9 A_{260} units, pH 7.0): 100-110 mmol/l
dUTP (high resolution HPLC method): ≥99 area%
dUDP (HPLC): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative

Cat. No.	Pack Size
04 631 145 103	20 ml (2,000 µmol)
11 889 532 103	100 ml (10,000 µmol)

04631145103: Will be supplied as "dUTP PCR Grade, Sodium Solution, 20 ml". Unit of Measure is "µmol".
11889532103: Will be supplied as "dUTP, Na, Solution (PCR Grade)". Unit of Measure is "µmol".

DRY ICE

For further processing only.

A_{250}/A_{260}: 0.74±0.02
A_{280}/A_{260}: 0.38±0.02
A_{290}/A_{260}: 0.04±0.01
Function test in RT-PCR (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
Stability: At -15 to -25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

NucleoMix (dTTP), PCR Grade
sodium salt, 40 mM (10 mmol/l each dNTP)

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTP NucleoMixes from the leading manufacturer of nucleotides.

Application
NucleoMix (dTTP), PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. The ready-to-use mix eliminates process steps.

Benefits
- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Save time and resources.** Eliminate process steps using a ready-to-use dNTP mix.
- **Rely on quality design and obtain reproducible results.** From the production process to formulation and final packaging, product release and long shelf life, lot after lot, NucleoMix meets all the requirements of the demanding kit manufacturer.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
NucleoMix (dTTP), PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

Specification
Appearance: Clear, colorless solution
pH value: 8.1-8.5
Concentration (sum, 1 µmol ≙ 10.7 A_{260} units, pH 7.0): 40-44 mmol/l
Identity (HPLC diode array detector):
dATP: 9-12 mmol/l
dCTP: 9-12 mmol/l
dGTP: 9-12 mmol/l
dTTP: 9-12 mmol/l
dNTP (HPLC, sum of 4 peaks): ≥99 area%
dNDP (HPLC, sum of 4 peaks): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
Function test in RT-PCR: Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
03 186 083 103	100 ml

Will be supplied as "Nucleomix (10 mmol/l, with dTTP)". Unit of Measure is "ml".

DRY ICE

For further processing only.

NucleoMix (dUTP), PCR Grade

sodium salt, 40 mM (10 mmol/l each dNTP)

Cat. No.	Pack Size
03 186 075 103	100 ml

Will be supplied as "Nucleomix (10 mmol/l,with dUTP)". Unit of Measure is "ml".

DRY ICE

For further processing only.

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTP NucleoMixes from the leading manufacturer of nucleotides.

Application

NucleoMix (dUTP), PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. The ready-to-use mix eliminates process steps. Avoid carryover contamination between PCRs, a significant source of false positives. To decontaminate PCR and RT-PCR reagent mixes, dUTP is incorporated in place of dTTP. Subsequent reactions should be treated with Uracil-DNA Glycosylase (UNG) before amplification to degrade dUTP-containing PCR products.

Benefits

- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Save time and resources.** Eliminate process steps using a ready-to-use dNTP mix.
- **Avoid false positive results.** Decontaminate before starting a new amplification reaction using Uracil-DNA Glycosylase to digest the dUTP-containing NucleoMix before PCR.
- **Rely on quality design and obtain reproducible results.** From the production process to formulation and final packaging, product release and long shelf life, lot after lot, NucleoMix meets all the requirements of the demanding kit manufacturer.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

NucleoMix (dUTP), PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

Specification

Appearance: Clear, colorless solution
pH value: 8.1–8.5
Concentration (sum, 1 µmol ≙ 11.0 A_{260} units, pH 7.0): 40–44 mmol/l
Identity (HPLC diode array detector):
dATP: 9–12 mmol/l
dCTP: 9–12 mmol/l
dGTP: 9–12 mmol/l
dUTP: 9–12 mmol/l
dNTP (HPLC, sum of 4 peaks): ≥99 area%
dNDP (HPLC, sum of 4 peaks): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
Function test in PCR: Corresponds to specification
Stability: At -15 to -25°C within specification range for 30 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

NucleoMix (dTTP), PCR Grade

sodium salt, 100 mM (25 mmol/l each dNTP)

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTP NucleoMixes from the leading manufacturer of nucleotides.

Application

NucleoMix (dTTP), PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. The ready-to-use mix eliminates process steps.

Benefits

- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Save time and resources.** Eliminate process steps using a ready-to-use dNTP mix.
- **Rely on quality design and obtain reproducible results.** From the production process to formulation and final packaging, product release and long shelf life, lot after lot, NucleoMix meets all the requirements of the demanding kit manufacturer.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

NucleoMix (dTTP), PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

Specification

Appearance: Clear, colorless solution
pH value: 8.1-8.5
Concentration (sum, 1 µmol ≙ 10.7 A_{260} units, pH 7.0): 100-110 mmol/l
Identity (HPLC diode array detector):
dATP: 23-28 mmol/l
dCTP: 23-28 mmol/l
dGTP: 23-28 mmol/l
dTTP: 23-28 mmol/l
dNTP (HPLC, sum of 4 peaks): ≥99 area%
dNDP (HPLC, sum of 4 peaks): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
Function test in RT-PCR: Corresponds to specification
Stability: At -15 to -25°C within specification range for 30 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
04 920 171 103	20 ml
03 991 016 103	100 ml

03991016103: Will be supplied as "Nucleomix, 25mM, Na, Slt. (PCR-Gr.)". Unit of Measure is "ml".
04920171103: Will be supplied as "NucleoMix PCR Grade, 25 mmol/l, 20 ml". Unit of Measure is "ml".

DRY ICE

For further processing only.

NucleoMix (dUTP), PCR Grade

sodium salt, 100 mM (25 mmol/l each dNTP)

Cat. No.	Pack Size
04 980 905 103	20 ml

Will be supplied as "NucleoMix PCR Grd (dU), 25 mmol/l, 20 ml". Unit of Measure is "ml".

For further processing only.

For outstanding, consistent performance in amplification reactions, use GMP-manufactured dNTP NucleoMixes from the leading manufacturer of nucleotides.

Application

NucleoMix (dUTP), PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for *in vitro* diagnostics. The ready-to-use mix eliminates process steps. Avoid carryover contamination between PCRs, a significant source of false positives. To decontaminate PCR and RT-PCR reagent mixes, dUTP is incorporated in place of dTTP. Subsequent reactions should be treated with Uracil-DNA Glycosylase (UNG) before amplification to degrade dUTP-containing PCR products.

Benefits

- **Insist on the highest purity for optimal results even with difficult targets.** PCR grade dNTPs are rigorously controlled for amplification inhibitors.
- **Save time and resources.** Eliminate process steps using a ready-to-use dNTP mix.
- **Avoid false positive results.** Decontaminate before starting a new amplification reaction using Uracil-DNA Glycosylase to digest the dUTP-containing NucleoMix before PCR.
- **Rely on quality design and obtain reproducible results.** From the production process to formulation and final packaging, product release and long shelf life, lot after lot, NucleoMix meets all the requirements of the demanding kit manufacturer.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

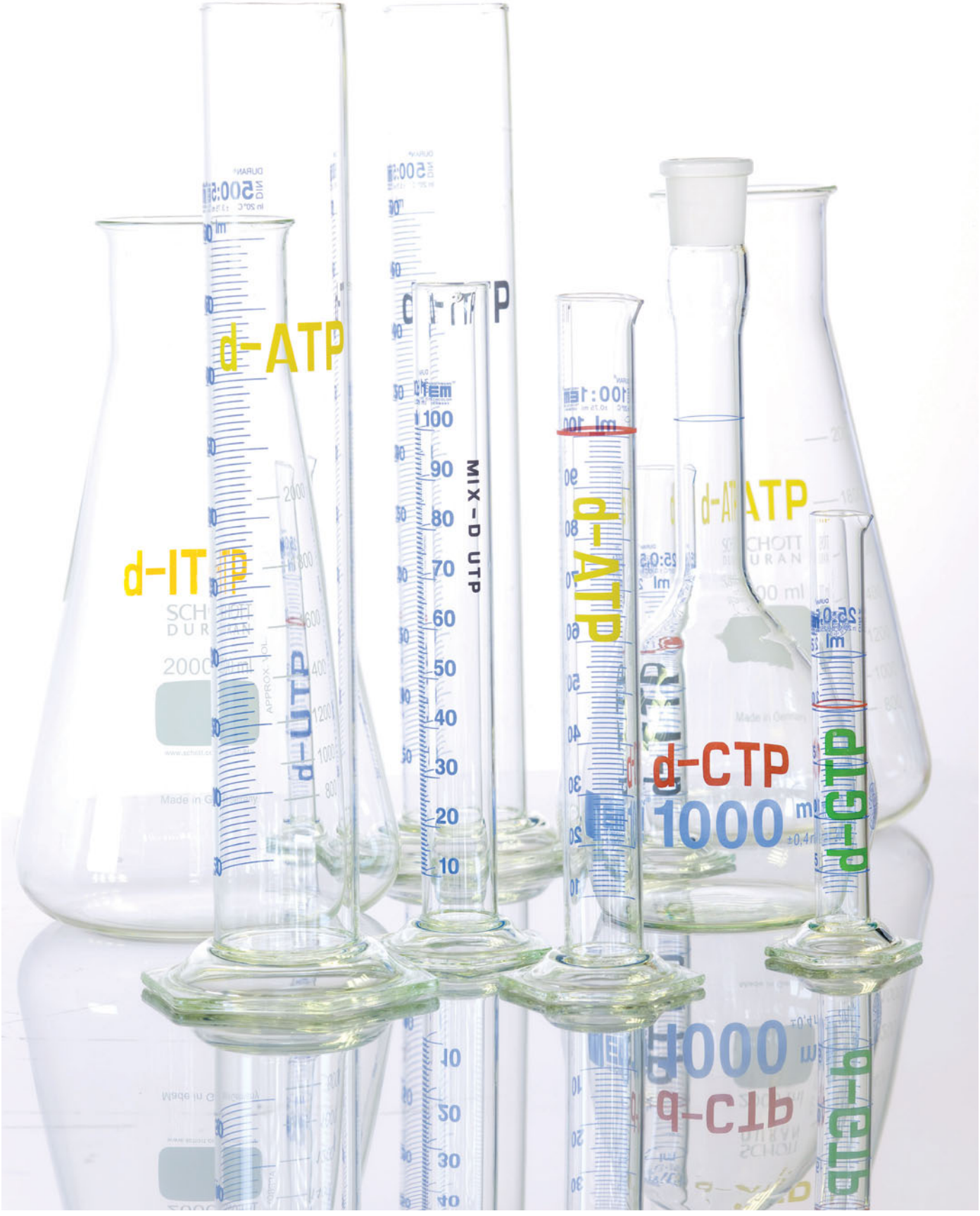
NucleoMix (dUTP), PGR Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for amplification.

Specification

Appearance: Clear, colorless solution
pH value: 8.1-8.5
Concentration (sum, 1 µmol ≙ 11.0 A_{260} units, pH 7.0): 100-110 mmol/l
Identity (HPLC diode array detector):
dATP: 23-28 mmol/l
dCTP: 23-28 mmol/l
dGTP: 23-28 mmol/l
dUTP: 23-28 mmol/l
dNTP (HPLC, sum of 4 peaks): ≥99 area%
dNDP (HPLC, sum of 4 peaks): ≤0.9 area%
DNases/RNases: Negative
Nicking activity: Negative
Function test in PCR: Corresponds to specification
Stability: At -15 to -25°C within specification range for 30 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.



ddATP, Sequencing Grade

sodium salt, 10 mM

For consistent performance in sequencing applications and primer extension reactions, use dideoxyribonucleotides from the leading manufacturer of nucleotides.

Application

ddATP, Sequencing Grade, in dNTP mixes acts as chain terminator in sequencing and primer extension reactions. High purity and proven manufacturing processes produce a product ideal for the manufacturing of *in vitro* diagnostics.

Benefits

- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these dideoxyribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the high lot-to-lot performance of this product.

Product Description

ddATP, Sequencing Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The pH is adjusted to match conditions for amplification.

Properties

Nomenclature: 2',3'-Dideoxy-adenosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{11}P_3$
Molecular weight: 475.2 D

Specification

Appearance: Clear, colorless solution
pH value: 8.1–8.5
ddATP (1 µmol ≙ 15.3 A_{260} units, pH 7.0): 10.0–11.0 mmol/l
ddATP (HPLC): ≥98 area%
ddADP (HPLC): ≤1.5 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.76±0.02
A_{280}/A_{260}: 0.15±0.01
A_{290}/A_{260}: ≤0.02
Stability: At -15 to -25°C within specification range for 24 months.

Quality

All dideoxynucleotides can be GMP manufactured upon request.

Cat. No.	Pack Size
12 158 175 103	100 ml (1,000 µmol)

Will be supplied as "Dideoxy-ATP, Na, Sequencing Grade, Solution". Unit of Measure is "µmol".

DRY ICE

For further processing only.

ddCTP, Sequencing Grade
sodium salt, 10 mM

For consistent performance in sequencing applications and primer extension reactions, use dideoxyribonucleotides from the leading manufacturer of nucleotides.

Application
ddCTP, Sequencing Grade, in dNTP mixes acts as chain terminator in sequencing and primer extension reactions. High purity and proven manufacturing processes produce a product ideal for the manufacturing of *in vitro* diagnostics.

Benefits
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these dideoxyribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the high lot-to-lot performance of this product.

Product Description
ddCTP, Sequencing Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The pH is adjusted to match conditions for amplification.

Properties
Nomenclature: 2',3'-Dideoxy-cytidine-5'-triphosphate
Formula: $C_9H_{16}N_3O_{12}P_3$
Molecular weight: 452.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
ddCTP (1 µmol ≙ 9.6 A_{272} units, pH 7.0): 10.0–11.0 mmol/l
ddCTP (HPLC): ≥98 area%
ddCDP (HPLC): ≤1.5 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.76±0.02
A_{280}/A_{260}: 1.06±0.02
A_{290}/A_{260}: 0.33±0.02
Stability: At -15 to -25°C within specification range for 24 months.

Quality
All dideoxynucleotides can be GMP manufactured upon request.

Cat. No.	Pack Size
12 158 183 103	100 ml (1,000 µmol)

Will be supplied as "Dideoxy-CTP, Na, Sequencing Grade, Solution". Unit of Measure is "µmol".

DRY ICE

For further processing only.

ddGTP, Sequencing Grade

sodium salt, 10 mM

For consistent performance in sequencing applications and primer extension reactions, use dideoxyribonucleotides from the leading manufacturer of nucleotides.

Application

ddGTP, Sequencing Grade, in dNTP mixes acts as chain terminator in sequencing and primer extension reactions. High purity and proven manufacturing processes produce a product ideal for the manufacturing of *in vitro* diagnostics.

Benefits

- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these dideoxyribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the high lot-to-lot performance of this product.

Product Description

ddGTP, Sequencing Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The pH is adjusted to match conditions for amplification.

Properties

Nomenclature: 2',3'-Dideoxy-guanosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{12}P_3$
Molecular weight: 491.2 D

Specification

Appearance: Clear, colorless solution
pH value: 8.1–8.5
ddGTP (1 µmol ≙ 13.7 A_{252} units, pH 7.0): 10.0–11.0 mmol/l
ddGTP (HPLC): ≥98 area%
ddGDP (HPLC): ≤1.5 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 1.16±0.02
A_{280}/A_{260}: 0.67±0.02
A_{290}/A_{260}: 0.27±0.01
Stability: At -15 to -25°C within specification range for 24 months.

Quality

All dideoxynucleotides can be GMP manufactured upon request.

Cat. No.	Pack Size
12 158 191 103	100 ml (1,000 µmol)

Will be supplied as "DideoxyGTP, Na, Sequencing Grade, Solution". Unit of Measure is "µmol".

DRY ICE

For further processing only.

ddTTP, Sequencing Grade
sodium salt, 10 mM

For consistent performance in sequencing applications and primer extension reactions, use dideoxyribonucleotides from the leading manufacturer of nucleotides.

Application
ddTTP, Sequencing Grade, in dNTP mixes acts as chain terminator in sequencing and primer extension reactions. The high purity and carefully designed manufacturing process are ideally suited for the manufacturing of *in vitro* diagnostics.

Benefits
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these dideoxyribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the high lot-to-lot performance of this product.

Product Description
ddTTP, Sequencing Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The pH is adjusted to match conditions for amplification.

Properties
Nomenclature: 2',3'-Dideoxy-thymidine-5'-triphosphate
Formula: $C_{10}H_{17}N_2O_{13}P_3$
Molecular weight: 466.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
ddTTP (1 µmol ≙ 8.4 A_{260} units, pH 7.0): 10.0–11.0 mmol/l
ddTTP (HPLC): ≥98 area%
ddTDP (HPLC): ≤1.5 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 0.60±0.02
A_{280}/A_{260}: 0.83±0.03
A_{290}/A_{260}: 0.31±0.02
Stability: At -15 to -25°C within specification range for 24 months.

Quality
All dideoxynucleotides can be GMP manufactured upon request.

Cat. No.	Pack Size
12 158 205 103	100 ml (1,000 µmol)

Will be supplied as "Dideoxy-TTP, Na, Sequencing Grade, Solution". Unit of Measure is "µmol".

DRY ICE

For further processing only.

ATP, Molecular Diagnostic Grade

sodium salt, 100 mM

Cat. No.	Pack Size
04 980 824 103	100 ml

Will be supplied as "ATP Mol Dia Grade, 100 mmol/l, 100 ml". Unit of Measure is "ml".

DRY ICE

For further processing only.

For outstanding, consistent performance in transcription reactions, use GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides.

Application

ATP, Molecular Diagnostics Grade, is designed for *in vitro* transcription reactions and alternative amplification reactions where high-quality reagents are required, such as for the manufacture of *in vitro* diagnostics.

Benefits

- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these ribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

ATP, Molecular Diagnostic Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for reverse transcription and amplification.

CAS: 56-65-5

Properties

Nomenclature: Adenosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{13}P_3$
Molecular weight: 507.2 D

Specification

Appearance: Clear, colorless solution
pH value: 8.1–8.5
ATP (1 µmol ≙ 15.0 A_{260} units, pH 7.0): 100–110 mmol/l
ATP (HPLC): ≥98 area%
ADP (HPLC): ≤1.5 area%
AMP (HPLC): ≤0.5 area%
Functional transcription assay: Corresponds to specification
DNases/RNases: Negative
Nicking activity: Negative
Stability: At -15 to -25°C within specification range for 30 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

CTP, Molecular Diagnostic Grade
sodium salt, 100 mM

For outstanding, consistent performance in transcription reactions, use GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides.

Application
CTP, Molecular Diagnostics Grade, is designed for *in vitro* transcription reactions and alternative amplification reactions where high-quality reagents are required, such as for the manufacture of *in vitro* diagnostics.

Benefits
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these ribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
CTP, Molecular Diagnostic Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for reverse transcription and amplification.

CAS: 65-47-4

Properties
Nomenclature: Cytidine-5'-triphosphate
Formula: $C_9H_{16}N_3O_{14}P_3$
Molecular weight: 483.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1-8.5
CTP (1 µmol ≙ 7.4 A_{260} units, pH 7.0): 100-110 mmol/l
CTP (HPLC): ≥98 area%
CDP (HPLC): ≤1.5 area%
CMP (HPLC): ≤0.5 area%
Functional transcription assay: Corresponds to specification
DNases/RNases: Negative
Nicking activity: Negative
Stability: At -15 to -25°C within specification range for 30 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
04 980 875 103	100 ml

Will be supplied as "CTP Mol Dia Grade, 100 mmol/l, 100 ml". Unit of Measure is "ml".

DRY ICE

For further processing only.

GTP, Molecular Diagnostic Grade

sodium salt, 100 mM

For outstanding, consistent performance in transcription reactions, use GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides.

Application

GTP, Molecular Diagnostics Grade, is designed for *in vitro* transcription reactions and alternative amplification reactions where high-quality reagents are required, such as for the manufacture of *in vitro* diagnostics.

Benefits

- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these ribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description

GTP, Molecular Diagnostic Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for reverse transcription and amplification.

CAS: 86-01-1

Properties

Nomenclature: Guanosine-5'-triphosphate
Formula: $C_{10}H_{16}N_5O_{14}P_3$
Molecular weight: 523.2 D

Specification

Appearance: Clear, colorless solution
pH value: 8.1–8.5
GTP (1 µmol ≙ 13.7 A_{252} units, pH 7.0): 100–110 mmol/l
GTP (HPLC): ≥98 area%
GDP (HPLC): ≤1.5 area%
GMP (HPLC): ≤0.5 area%
Functional transcription assay: Corresponds to specification
DNases/RNases: Negative
Nicking activity: Negative
Stability: At -15 to -25°C within specification range for 30 months.

Quality

Manufactured under GMP (Good Manufacturing Practice) regulations.

Cat. No.	Pack Size
04 980 859 103	100 ml

Will be supplied as "GTP Mol Dia Grade, 100 mmol/l, 100 ml". Unit of Measure is "ml".

DRY ICE

For further processing only.

UTP, Molecular Diagnostic Grade
sodium salt, 100 mM

For outstanding, consistent performance in transcription reactions, use GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides.

Application
UTP, Molecular Diagnostics Grade, is designed for *in vitro* transcription reactions and alternative amplification reactions where high-quality reagents are required, such as for the manufacture of *in vitro* diagnostics.

Benefits
- **Rely on quality by design.** From the production process to formulation and final packaging, product release and long shelf life, these ribonucleotides meet all the requirements of the demanding kit manufacturer.
- **Obtain consistent results.** Rely on the robust lot-to-lot performance of this product.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to Good Manufacturing Practice (GMP) regulations.

Product Description
UTP, Molecular Diagnostic Grade, is supplied in sealed and CO_2-proof bottles to ensure a stable pH during shipment on dry ice. The manufacturing process is fully validated including the final filling step. The pH is adjusted to match conditions for reverse transcription and amplification.

CAS: 63-39-8

Properties
Nomenclature: Uridine-5'-triphosphate
Formula: $C_9H_{15}N_2O_{15}P_3$
Molecular weight: 484.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
UTP (1 µmol ≙ 9.9 A_{260} units, pH 7.0): 100–110 mmol/l
UTP (HPLC): ≥98 area%
UDP (HPLC): ≤1.5 area%
UMP (HPLC): ≤0.5 area%
Functional transcription assay: Corresponds to specification
DNases/RNases: Negative
Nicking activity: Negative
Stability: At -15 to -25°C within specification range for 30 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

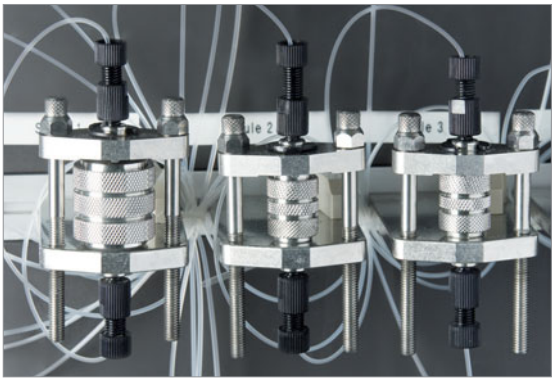
Cat. No.	Pack Size
04 979 818 103	100 ml

Will be supplied as "UTP Mol Dia Grade, 100 mmol/l, 100 ml". Unit of Measure is "ml".

DRY ICE

For further processing only.

Custom-Made Primers and Probes Produced According to cGMP



Columns for oligonucleotide synthesis

DNA- and RNA-based diagnostics require unmodified or labeled oligonucleotides. Roche has the expertise, capability, and capacity to routinely develop and produce high-quality customized oligonucleotides in large quantities.

Roche has extensive experience in the development and production of custom primers and probes for diagnostics manufacturers, with a focus on filling and labeling according to customer needs:

- Oligonucleotides, modified or conjugated *(e.g.,* biotin, amino, or 3'-phosphate groups)
- Probes labeled with dyes, such as LightCycler® dyes
- Oligonucleotides coupled to customer-designed labels
- Modified amidites and CPG supports
- Additional analytical methods

Final filling step takes place in a laminar flow box

The Roche oligonucleotide production facility allows synthesis scales from 15 µmoles to a few mmoles per batch. With a variety of proven purification protocols optimized for specific types of oligonucleotides, you are assured the high purity, quality, regulatory standards, and safety standards during synthesis.

- Choose from several production-scale synthesizers: 15 – 2000 µmol.
- Select from a variety of preparative HPLC purification lines: 15 – 400 µmol.
- Utilize ultrafiltration (UF) cross-contamination-free concentration/ desalting capabilities: 15 – 2000 µmol.
- Take advantage of proven oligo-protein-conjugate capabilities.
- Use comprehensive in-process control equipment: analytical HPLC systems, spectrometers, mass spectrometry.

Professional Support for Manufacturers of Molecular Diagnostics

Our personalized service features the detailed technical advice of Roche oligonucleotide experts right from the beginning.

We are happy to discuss project-specific details (*e.g.,* scale, specifications, sequence, regulatory requirements, time frame, patents) in-depth, and your project will be handled with complete confidentiality, with confidential disclosure agreements provided upon request.

- A pre-production test synthesis run may be required to ensure we are meeting your needs.
- Ensure quality with your own eyes. After your large scale synthesis run under regulatory demands, a representative sample is sent to you for function testing.
- Individual specifications will be set for each product.
- Production will proceed in complete accordance to your needs and regulatory requirements.

During purification by chromatography, each fraction is analyzed for purity.

GMP Grade Oligonucleotides

Roche is one of a few suppliers in the world that can produce customized oligonucleotides according to GMP. In answer to the rising importance of GMP manufacturing for diagnostic reagents, we built a state-of-the-art oligonucleotide production facility in early 2001.

In our processes, all raw materials must meet the highest quality and regulatory demands, and all vendors of building blocks and solvents must be qualified. Even the water used for the production process is monitored for microbial and RNase/DNase contamination. All production processes for oligonucleotides follow strict regulatory requirements and are designed to keep oligonucleotides in solution at all times, minimizing the risk of cross-contamination.

- All production areas are Class 100,000 with reference to non-viable particle counts (> 0.5 µ/cft) and less than 200 cfu/m^3. Filling of bulk solutions takes place in a laminar flow box (Class 100).
- Documentation includes batch records with full traceability of raw material and equipment.
- A strict product segregation policy prevents all cross-contamination.
- The “dedication/single-use” concept ensures that materials having direct contact with the product (*e.g.,* graduated cylinders, fraction vials) are sterilized and used only once. Equipment in direct contact with the product (*e.g.,* prep. HPLC columns, UF membranes) are also dedicated for a single product or parameter.
- Processes and methods of production of oligonucleotides are validated and controlled by an independent quality measure.

Production process controls also apply to in-house personnel.

- A defined flow of personnel, material, and equipment maintains traceability and the highest quality standards.
- Access to dedicated laboratories is controlled for security and safety.

GC-RICH Solution
5x concentrated

Cat. No.	Pack Size
05 917 158 103	1 ml
12 161 583 103	custom fill

12161575103: Will be supplied as "GC-rich solution, MBF". Unit of Measure is "piece".
12161583103: Will be supplied as "GC-rich solution". Unit of Measure is "l".

DRY ICE

For further processing only.

Additive for efficient amplification of difficult DNA templates as GC-rich targets up to 5 kb in the polymerase chain reaction (PCR).

Application
Use GC-RICH Solution in combination with PCR buffer to improve the amplification of GC-rich template DNA, GC-rich targets and repetitive sequences, as well as mixtures of nucleic acids with varying GC content.

Benefits
- **Enhance performance with difficult targets.** Use GC-RICH Solution to quickly optimize amplification of difficult templates.
- **Obtain reliable results.** Rely on the high lot-to-lot consistency of this product, thoroughly tested for a consistent quality.

Specification
Appearance: Clear, colorless solution.
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µl after 1 hour incubation at +37°C.
Function test in PCR (200 ng human genomic DNA, 284 bp ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

LightCycler® 480 Multiwell Plate 384
white, 4 barcodes

Cat. No.	Pack Size
05 217 555 001	5 x 10 plates without sealing foils

Will be supplied as "LC480 Multiwell Plate 384, 4 bar codes". Unit of Measure is "piece". The plates are supplied without sealing foils.
For further processing only.

Patent and License Disclaimer(s): 51

High-performance reaction device tailor-made for the LightCycler® 480 Instruments, 384-well version.

Application
Use LightCycler® 480 Multiwell Plates 384 for real-time PCR and melting curve analysis applications with the LightCycler® 480 Instrument, 384-well version.

Benefits
- **Gain excellent performance.** Benefit from plates, which fully exploit the special thermal and optical characteristics of the LightCycler® 480 Instrument, 384-well.
- **Simplify PCR setup.** Take advantage of the plate design with cut-away corner for error-free positioning.
- **Simplify PCR sample tracking.** Rely on identical barcodes fixed on each side of the plate for easy assay and sample tracking.
- **Profit from the cost efficiency.** The plate design is compatible with a variety of robotic systems. Save costs for sealing foils using proven automated sealing.

Product Description
LightCycler® 480 Multiwell Plates 384 are full-skirted, white polypropylene reaction devices supplied with a barcoded label on each side of the plate. Their dimensions (inner/outer well geometry) and material are designed to achieve optimal results using the LightCycler® 480 Instrument, 384-well, for reaction volumes from 5 to 20 µl.

Specification
Appearance (visual control): Corresponds to specification
Sample evaluation (visual control): Corresponds to specification
Stability: Store at +15 to +25°C.

LightCycler® 480 Multiwell Plate 96
white, 4 barcodes

Cat. No.	Pack Size
05 220 319 001	5 x 10 plates without sealing foils

Will be supplied as "LC480 Multiwell Plate 96, 4 bar codes". Unit of Measure is "piece". The plates are supplied without sealing foils. For further processing only.

Patent and License Disclaimer(s): 51

High-performance reaction device tailor-made for the LightCycler® 480 Instruments, 96-well version.

Application
LightCycler® 480 Multiwell Plates 96 are used for real-time PCR and melting curve analysis applications with the LightCycler® 480 Instrument, 96-well version.

Benefits
- **Gain excellent performance.** Benefit from plates, which fully exploit the special thermal and optical characteristics of the LightCycler® 480 Instrument, 96-well.
- **Simplify PCR setup.** Take advantage of the plate design with cut-away corner for error-free positioning.
- **Simplify PCR sample tracking.** Rely on identical barcodes fixed on each side of the plate for easy assay and sample tracking.
- **Profit from the cost efficiency.** The plate design is compatible with a variety of robotic systems. Save costs for sealing foils using proven automated sealing.

Product Description
LightCycler® 480 Multiwell Plates 96 are half-skirted, white polypropylene reaction devices supplied with a barcode label on each side of the plate. Their dimensions (inner/outer well geometry) and material are designed to achieve optimal results using the LightCycler® 480 Instrument, 96-well, for reaction volumes from 10 to 100 µl.

Specification
Appearance (visual control): Corresponds to specification
Sample evaluation (visual control): Corresponds to specification
Stability: Store at +15 to +25°C.

$MgCl_2$ Stock Solution
25 mM

Cat. No.	Pack Size
11 600 770 103	1 ml
11 600 788 103	custom fill

11600770103: Will be supplied as "MgCl2-Slt. 25mM MPB". Unit of Measure is "piece".
11600788103: Will be supplied as "MgCl2-Solution 25mM/Bulk". Unit of Measure is "ml".

DRY ICE

For further processing only.

PCR Grade $MgCl_2$ Stock Solution.

Application
Use this $MgCl_2$ Stock Solution in combination with any PCR buffer without $MgCl_2$ to optimize the magnesium concentration.

Benefits
- **Obtain reliable results.** Rely on the high lot-to-lot consistency of this product, thoroughly tested for a constant quality.
- **Simplify your PCR setup.** Save time producing a suitable, pure $MgCl_2$ solution with this ready-to-use formulation.

Specification
Appearance: Clear, colorless solution
Contents: $MgCl_2$, 25 mmol/l; pH approximately 8.3 at +20°C

Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activitiy (pBR322 DNA): Not detectable in up to 20 µl after16 hours incubation at +65°C.
Function test in PCR (0.01 ng λDNA, 0.5 kb lambda fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Protector RNase Inhibitor
from rat lung, expressed in *E. coli*

Cat. No.	Pack Size
03 335 429 103	custom fill

Will be supplied as "Protector RNase Inhibitor". Unit of Measure is "MU".

DRY ICE

For further processing only.

Protector RNase Inhibitor is useful in any application where RNA degradation by RNases is critical.

Application
Use Protector RNase Inhibitor to:
- Protect RNA in cDNA synthesis reactions, *in vitro* transcription/translation systems, *in vitro* RNA synthesis, and *in vitro* virus replication
- Protect RNA during RNA isolation and purification
- Produce RNase activity-free antibodies

Benefits
- **Protect your RNA over a wide range of reaction conditions.** Use Protector RNase Inhibitor also with more thermostable reverse transcriptases for cDNA synthesis at elevated temperatures. It is stable at temperatures up to +55°C and at pH 5.0 to 9.0.
- **Don't worry about interference.** Even at high concentrations, Protector RNase Inhibitor does not interfere with other enzymes and reagents commonly used to analyse RNA.
- **Insist on a highly-purified preparation.** Each batch is function tested for the absence of nucleic acid modifying activities.

Properties
Protector RNase Inhibitor is a protein of 50 kD which inhibits enzymatic activity of RNases by noncovalently binding to the active site.
Activity: A minimum of 1 mmol/l DTT is required to maintain the inhibitor in its active state; a pH value between 5.0 and 9.0 is recommended (isoelectric point is at pH 4.7).
Inactivation: At temperatures >+65°C or under severe denaturing conditions the inhibitory activity disappears.

Specification
Appearance: Clear, colorless solution
Storage buffer: Hepes-KOH, 20 mmol/l; KCl, 50 mmol/l; DTT, 8 mmol/l; glycerol, 50% (v/v); pH approximately 7.6
Volume activity: ≥40 U/µl
Specific activity: ≥80 kU/mg protein
Unit definition: One unit Protector RNase Inhibitor is defined as the amount which inhibits 50% of the activity of 5 ng RNase A (activity measured according to Blackburn by inhibition of hydrolysis of cyclic cytidine-monophosphoric acid).
Purity (SDS PAGE): ≥95%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Ribonuclease activity after thermal inactivation of inhibitor (10 minutes

at +65°C, MS2 RNA): Not detectable in up to 160 U after 1 hour incubation at +37°C.
Function test in RT-PCR (Titan One Tube RT-PCR Kit with control RNA): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® instrument (PBGD gene fragment from RNA standards): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

RNase Inhibitor, recombinant, GMP Grade
from rat lung, expressed in *E. coli*

RNase Inhibitor, recombinant, GMP Grade, is useful in any application where RNA degradation by RNases is critical.

Application
Use RNase Inhibitor, recombinant, GMP Grade, to:
- Protect RNA in cDNA synthesis reactions, *in vitro* transcription/translation systems, *in vitro* RNA synthesis, and *in vitro* virus replication
- Protect RNA during RNA isolation and purification
- Produce RNase activity-free antibodies
- Manufacture reaction mixtures for applications with regulatory requirements (*e.g.,in vitro* diagnostics, quality control)

Benefits
- **Protect your RNA over a wide range of reaction conditions.** Use RNase Inhibitor, recombinant, GMP Grade, also with more thermostable reverse transcriptases for cDNA synthesis at elevated temperatures. It is stable at temperatures up to +55°C and at pH 5.0 to 9.0.
- **Don't worry about interference.** Even at high concentrations, RNase Inhibitor, recombinant, GMP Grade, does not interfere with other enzymes and reagents commonly used to analyze RNA.
- **Insist on a highly-purified preparation.** Each batch is extensively function tested for the absence of nucleic acid modifying activities.
- **Stay ahead of regulatory requirements.** High quality manufacturing, quality control and documentation according to GMP (Good Manufacturing Practice) regulations.

Properties
RNase Inhibitor, recombinant, GMP Grade, is a protein of 50 kD which inhibits enzymatic activity of RNases by noncovalently binding to the active site.
Activity: A minimum of 1 mmol/l DTT is required to maintain the inhibitor in its active state; a pH value between 5.0 and 9.0 is recommended (isoelectric point is at pH 4.7).
Inactivation: At temperatures >+65°C or under severe denaturing conditions the inhibitory activity disappears.

Specification
Appearance: Clear, colorless solution
Storage buffer: Hepes-KOH, 20 mmol/l; KCl, 50 mmol/l; DTT, 8 mmol/l; glycerol, 50% (v/v); pH approximately 7.6
Volume activity: ≥40 U/µl
Specific activity: ≥80 kU/mg protein
Unit definition: One unit RNase Inhibitor, recombinant, GMP Grade, is defined as the amount which inhibits 50% of the activity of 5 ng RNase A (activity measured according to Blackburn by inhibition of hydrolysis of cyclic cytidine-monophosphoric acid).
Purity (SDS PAGE): ≥95%
DNA content: <100 pg/mg protein

Cat. No.	Pack Size
04 488 105 103	100 kU
03 247 058 103	1.4 MU

04488105103: Will be supplied as "RNase Inhibitor Ind. GMP Grade, 100 KU". Unit of Measure is "piece".
03247058103: Will be supplied as "RNAse Inh. GMP, Blk 1.4M U/ bottle". Unit of Measure is "MU".

DRY ICE

For further processing only.

Unspecific endonucleases (MWM III DNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 400 U after 1 hour incubation at +37°C.
Ribonucleases after thermal inactivation of inhibitor (10 minutes at +65°C, MS2 RNA): Not detectable in up to 160 U after 1 hour incubation at +37°C.
Function test in RT-PCR (Titan One Tube RT-PCR Kit with control RNA): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® instrument (PBGD gene fragment from RNA standards): Corresponds to reference
Bioburden:<50 CFU/ml
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Random Octamer Primer
2.5x concentrated solution

Cat. No.	Pack Size
05 109 701 103	7 ml

Will be supplied as "Random Octamer (2.5X), MPB". Unit of Measure is "piece".

DRY ICE

For further processing only.

Use Random Octamer Primer for cDNA synthesis and to prime synthesis in oligonucleotide labeling.

Application
Use Random Octamer Primer for priming oligonucleotide labeling and cDNA synthesis.

Benefits
- Obtain consistent results in your RT-PCR reaction using the Random Octamer Primer.
- Produce high specific activity labeled DNA probes for *in situ* hybridization, northern and Southern blots.

Product Description
Random Octamer Primer is a mixture of 8-mer primers comprised of all possible sequences.

Specification
Appearance: Colorless solution
Contents: Tris/HCl, 120 mmol/l; $MgCl_2$, 12.5 mmol/l; octamer primer, 750 µg/ml; β-mercaptoethanol, 25 mmol/l; pH 7.0
Function test in octamer primed labeling (Cy5-dCTP):
Amount of DNA: ≥2.8 µg
Amount of fluorescently labeled dye: ≥100 pmol
Base to dye ratio: 40-80
Stability: At -15 to -25°C within specification range for 18 months.

T4 Gene 32 Protein, recombinant
recombinant from T4 phage, expressed in *E. coli*, solution

Cat. No.	Pack Size
05 793 262 103	custom fill

Will be supplied as "T4 Gene 32 Protein, rec.". Unit of Measure is "mg".
For further processing only.

T4 Gene 32 Protein, recombinant, is a DNA-binding protein specific for single-stranded DNA, which can be used to improve the outcome of reverse transcription and PCR.

Application

Use T4 Gene 32 Protein, recombinant, for:

- Optimization of reverse transcription and PCR (addition of T4 Gene 32 Protein to the reaction mixture can increase yield, specificity and efficiency of cDNA synthesis and DNA amplification)
- Stimulation of *in vitro* DNA synthesis
- Stabilization of single-stranded regions of DNA and RNA
- Sequencing of DNA with strong secondary structures
- Site-specific mutagenesis experiments using T4 DNA Ligase or T4 DNA Polymerase
- Complete digestion of DNA by restriction enzymes

Benefits

- Add T4 Gene 32 Protein to reaction mixes to improve performance of PCR and RT-PCR reactions.
- Rely on a contamination-controlled recombinant product with high lot-to-lot consistency.

Properties

Molecular weight: 35 kD
pH optimum: About 8.0
Isoelectric point: pH 5.5
Inactivation: After 20 minutes heat denaturation at +65°C the DNA binding activity is abolished.

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; NaCl, 100 mmol/l; EDTA, 1.0 mmol/l; DTT, 0.5 mmol/l; glycerol, 50% (v/v), pH approximately 8.0
ssDNA binding (shift in gelelectrophoresis): Corresponds to reference
Unspecific endonucleases (λDNA): Not detectable in up to 50 µg after 1 hour incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 50 µg after 1 hour incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 50 µg after 1 hour incubation at +37°C.
Single-strand specific exonucleases (M13mp9 DNA): Not detectable in up to 50 µg after 1 hour incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 50 µg after 1 hour incubation at +37°C.
Absence of contaminating nucleic acids
(LightCycler® UniTOOL Resolight assay for detection of bacterial and fungal DNA): <1 genome equivalent/50 µg
(LightCycler® PCR assay for detection of human β-Globin gene): <1 gene copy/50 µg
Stability: At -15 to -25°C within specification range for 12 months.

Uracil-DNA Glycosylase, heat-labile
from marine bacterium BMTU 3346, expressed in *E. coli*

Cat. No.	Pack Size
11 780 565 103	custom fill

Will be supplied as "Uracil-DNA Glycosylase, heatlab". Unit of Measure is "kU".

DRY ICE

For further processing only.

Uracil-DNA Glycosylase (UNG) with an increased heat intolerance is the enzyme of choice for prevention of PCR carryover contamination.

Application

Use Uracil-DNA Glycosylase, heat-labile, (UNG) for prevention of carryover contamination with DNA amplification products in PCR. Always use dUTP containing PCR mixtures to enable decontamination by UNG treatment. In contrast to the UNG variant from *E.coli*, this heat-labile enzyme is completely

inactivated in the initial heat denaturation step of a common PCR protocol and the formed PCR product will not be degraded.
Note: For high sensitive real-time PCR, specially optimized LightCycler® Uracil-DNA Glycosylase is recommended.

Benefits
- **Prevent carryover contamination.** Avoid the risk of false-positive PCR results by simple addition of this reagent to your PCR mixture.
- **Secure your PCR products.** No degradation of your amplified DNA due to the fast inactivation of this heat-labile enzyme in the beginning of the PCR protocol.

EC 3.2.2.15

Properties
Uracil-DNA Glycosylase hydrolyzes uracil-glycosidic bonds in DNA, creating abasic sites where the DNA is cleaved by heat, alkali, or endonuclease treatment. This heat-labile enzyme is easily inactivated by heat denaturation.
Specificity: Hydrolyzes uracil-glycosidic bonds in single- and double-stranded DNA; no activity on dU-free natural DNA and RNA.
Incubation: +15 to +25°C for 10 minutes are recommended for treatment of PCR mixtures; at higher temperatures the enzyme stability decreases.
Half life at +40°C: About 2 minutes
Heat inactivation: +95°C for 2 minutes are sufficient for inactivation
pH optimum: 8.3-8.9
Inhibition: Activity does not depend on metal ions; no inhibition in presence of EDTA or other chelating reagents.

Specification
Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.1 mmol/l; glycerol, 50% (v/v); Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); pH 8.0±0.1 at +4°C
Volume activity: ≥1 U/µl
Unit definition: One unit Uracil-DNA Glycosylase, heat-labile, is defined as the amount of enzyme required to completely degrade 1 µg purified single-stranded uracil-containing DNA (bacteriophage M13, grown in *E.coli* CJ236 dut-ung-) at +37°C within 60 minutes. For comparison, one Lindahl unit is comparable to 520,000 units based on our unit definition. One Lindahl unit is defined as the amount of enzyme required to release 1 mol uracil at +37°C in 1 minute.
Unspecific endonucleases (MWM III DNA and M13mp9 ssDNA): Not detectable in up to 20 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 10 U after 4 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 20 U after 4 hours incubation at +65°C.
Function test, DNA decontamination (complete elimination of 10,000 copies of uracil-containing template DNA in a PCR assay): Corresponds to specification
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 18 months.

Water, PCR Grade

Specially purified, double-distilled, deionized, and autoclaved water.

Application

This product is specially tested and qualified for use in all PCR or RT-PCR. It can be used in conjunction with all endpoint or real-time PCR assays whenever highest quality water is required. All LightCycler® kits and many of the PCR amplification products, available from Roche Applied Science, contain Water, PCR Grade.

Benefits

- For high quality PCR, use pre-tested Water, PCR Grade.
- Trust this specially purified, double distilled, deionized, autoclaved water.
- There are no detectable endonucleases, ribonucleases and nicking activities.

CAS: 7732-18-5

Specification

Appearance: Clear, colorless solution
Content: Water
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +65°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µl after 1 hour incubation at +37°C.
Performance test in PCR (0.01 ng λDNA, 0.5 kb λDNA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Quality

Function test: Each lot of Water, PCR Grade is tested using PCR amplification of a 0.5 kb target from 0.01 ng λDNA. When the PCR product is analyzed using gel electrophoresis, a clear, defined band is obtained.
Absence of nucleases: Water, PCR Grade, is tested using nucleic acids serving as nuclease substrates. No endonucleases, ribonucleases, or nicking activities are detected according to the strict Quality Control procedures.

Cat. No.	Pack Size
03 315 959 001	25 ml 1 x 25 ml
03 315 843 001	100 ml 4 x 25 ml

Will be supplied as "Water, PCR-Grade". Unit of Measure is "piece".

DRY ICE

For life science research only. Not for use in diagnostic procedures.

Water, PCR Grade

Specially purified, double-distilled, deionized, and autoclaved water.

Application

Use Water, PCR Grade, for the preparation for solutions used in molecular diagnostics or molecular biology.

Benefits

- **Protect your expensive raw materials.** Use Water, PCR Grade, which is extensively tested to avoid the introduction of contaminants.
- **Obtain process security.** Use the same high quality water in all production lots.

CAS: 7732-18-5

Specification

Appearance: Clear solution
pH value: 5.0–7.0
Bioburden: <1 CFU/100 ml
TOC: <0.5 ppm
Conductivity: <1.3 µS/cm
DNases/RNases: Negative
Endotoxins (LAL assay): <0.25 EU/ml
Stability: At +15 to +25°C within specification range for 24 months.

Quality

Water, PCR Grade, is specially purified, double-distilled, deionized, and autoclaved. Nucleases that degrade DNA and RNA are not detectable. The product is tested for total organic content (TOC) and bioburden to avoid contamination with microorganisms and nucleic acids. In addition, Water, PCR Grade, is tested for endotoxins.

Cat. No.	Pack Size
03 036 430 103	0.5 Liter

Will be supplied as "Water PCR grade". Unit of Measure is "l".
For further processing only.

Anti-Digoxigenin-AP, Fab fragments

polyclonal antibodies from sheep, lyophilizate

Fab fragments of a polyclonal anti-digoxigenin antibody conjugated to alkaline phosphatase for nonradioactive detection.

Application

Use Anti-Digoxigenin-AP, Fab fragments, for the detection of digoxigenin-labeled compounds using:

- cDNA array and nonradioactive DNA sequencing blot
- Colony/plaque hybridization
- Dot blot and ELISA
- Gel shift assay
- Immunohistocytochemistry
- *In situ* hybridization
- Northern, Southern, western blot
- RNase protection assay

Benefits

- Benefit from a hazard free labeling and detection system without the risks associated with radioactive assays.
- Achieve higher sensitivity and faster results compared to isotopic procedures.
- Profit from single-step detection using any substrate of alkaline phosphatase.
- Use Anti-Digoxigenin-AP, Fab fragments, for all your applications in combination with other Roche products.

Properties

Molecular weight: 50 kD (Fab fragment), 140 kD (alkaline phosphatase)
Specificity: Specific to digoxigenin and digoxin.
Cross-reactivity:
Digitoxin and digitoxigenin: <1%
None to other human estrogen and androgen steroids, *e.g.,* estradiol or testosterone.
Digoxina: Not known
Binding:
Conjugate does not bind to itself.
Normally one molecule conjugate binds to one molecule digoxigenin, although there are two possible binding sites for digoxigenin.
Unspecific binding to RNA has not been reported.

Specification

Apppearance: Clear, colorless solution
Volume activity (+37°C): 750-825 U/ml
Sensitivity: ≤0.1 pg
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
11 082 736 103	custom fill

Will be supplied as "Anti-digoxigenin AP-conjugate". Unit of Measure is "kU".
For further processing only.

Anti-Digoxigenin-POD, Fab fragments

polyclonal antibodies from sheep, lyophilizate

Fab-fragments of a polyclonal anti-digoxigenin antibody conjugated to horseradish peroxidase for nonradioactive detection.

Application

Use Anti-Digoxigenin-POD, Fab fragments, for the detection of digoxigenin-labeled compounds using:

- Dot blots and ELISA
- Immunohistocytochemistry
- *In situ* hybridization
- Western blot

Benefits

- Benefit from a hazard free labeling and detection system without the health risks associated with radioactive assays.
- Achieve higher sensitivity and faster results compared to isotopic procedures.
- Profit from the broad Roche product portfolio related to the DIG system.

Properties

Molecular weight: Molecular weight is within a broad range of 200 kD to several million kD depending on how large the complexes are.
Specificity: Specific to digoxigenin and digoxin.
Cross-reactivity: None to other human estrogen or androgen steroids, *e.g.,* estradiol or testosterone.

Specification

Appearance: Clear, brown solution
Volume activity (+25°C, ABTS): 3,400-4,600 U/ml
Storage buffer: Potassium phosphate 10 mmol/l; NaCl 100 mmol/l; succrose, 7.5%; RPLA4, 5 mg/ml; pH 7.5
pH 5.5 treatment (≥30 minutes): Corresponds to specification
Performance test (immune reaction signal height): Corresponds to specification
Stability: At -196°C within specification range for 48 months.

Cat. No.	Pack Size
11 210 360 103	custom fill

Will be supplied as "Anti-digoxigenin POD-conjugate". Unit of Measure is "kU".

DRY ICE

For further processing only.

Anti-Digoxigenin-Rhodamine, Fab fragments

polyclonal antibodies from sheep, lyophilizate

Fab-fragments of a polyclonal anti-digoxigenin antibody conjugated to rhodamine for nonradioactive detection.

Application

Use Anti-Digoxigenin-Rhodamine, Fab fragments, for the detection of digoxigenin-labeled compounds using:

- Digoxigenin-labeled sugars in glycoconjugate research
- Fluorescent *in situ* hybridization (FISH)
- Immunohistocytochemistry
- *In situ* hybridization

Benefits

- Simplify detection by direct visualization using a fluorescence microscope.
- Benefit from hazard free labeling and detection system without the risk associated with radioactive assays.
- Achieve higher sensitivity and faster results compared to isotopic procedures.
- Use Anti-Digoxigenin-Rhodamine, Fab fragments, for all your applications in combination with other Roche products.

Properties

Molecular weight: 50 kD (not conjugated) ≤MW ≤54.22 kD (fully conjugated). Two to three rhodamine molecules are fused to one anti-digoxigenin, Fab fragment.
Specificity: Specific to digoxigenin and digoxin.
Cross-reactivity: None to other human estrogen and androgen steroids, *e.g.,* estradiol or testosterone.

Specification

Appearance: Clear, red, fluorescent solution
Performance test (*in situ* hybridization): Corresponds to specification
Stability: At -60 to -90°C within specification range for 36 months.

Cat. No.	Pack Size
11 210 378 103	custom fill

Will be supplied as "Anti-digoxigenin-rhodamine". Unit of Measure is "mg active ingredient".

DRY ICE

For further processing only.

Klenow Enzyme, Labeling Grade
from *E. coli* lysogenic NM 964, solution

Klenow enzyme is a DNA-dependent 5'-3' polymerase with 3'-5' exonuclease activity to synthesize DNA complementary to single-stranded DNA templates.

Application
Use Klenow Enzyme for:
- Random-primed DNA labeling using random oligonucleotides as primers for the incorporation of nonradioactively labeled and ^{32}P-labeled nucleotides
- Fill-in reaction for blunt-end formation of 3'-recessed (staggered) ends

Benefits
- Obtain consistent performance compared to the native enzyme due to high lot-to-lot consistency of the recombinant enzyme.
- Rely on the secure supply as calf thymus is no longer used.

Product Description
Klenow Enzyme is a DNA-dependent 5'-3' polymerase with 3'-5' exonuclease activity. It lacks the 5'-3' exonuclease activity of the native enzyme. Klenow Enzyme catalyzes the addition of mononucleotides to the 3'-OH terminus of DNA. This activity is used to synthesize DNA complementary to single-stranded DNA templates.

EC 2.7.7.7

Properties
Molecular weight: 68 kD

Specification
Appearance: Colorless solution
Storage buffer: Potassium phosphate, 50 mmol/l; DTE, 1 mmol/l; glycerol, 50% (v/v); pH approximately 7.0 at +4°C
Volume activity: ≥2,000 U/ml
Specific activity: ≥5,000 U/mg
Unit definition: One unit is the enzyme activity which incorporates 10 nmol of total nucleotides into an acid-precipitable fraction in 30 minutes under assay conditions at +37°C with poly [d(A-T)] as primer (Richardson, C.C. & Kornberg, A. (1994) J. Biol. Chem. ***244***, 2996).
Purity (SDS gel electrophoresis, using up to 50 U enzyme): ≥90%
Protein: ≤0.4 mg/ml
Nicking activity (pBR322 DNA): Not detectable in up to 50 U after 16 hours incubation at +37°C.
Function test using Random Primed DNA Labeling Kit (>50% incorporation radioactive nucleotids after 30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
11 010 492 103	custom fill

Will be supplied as "Klenow Enzyme, Labeling Grade". Unit of Measure is "kU".

DRY ICE

For further processing only.

Terminal Transferase, recombinant
from calf thymus, expressed in *E. coli*, solution

Terminal Transferase catalyzes the addition of deoxy- and dideoxynucleoside triphosphates to the 3'-OH ends of double- and single-stranded DNA fragments and oligonucleotides.

Application
Use Terminal Transferase to add homopolymer tails to DNA fragments in cloning experiments, such as addition of overhanging ends onto cDNAs for easier cloning and labeling of 3' ends of double- and single-stranded DNA (*e.g.,* oligonucleotides) with radioactive labeled nucleotides or nucleotides labeled with haptens, *e.g.,* digoxigenin or biotin.

Benefits
- Profit from high lot-to-lot consistency due to the recombinant production process.
- Obtain outstanding performance compared to the native enzyme.

Product Description
Terminal Transferase catalyzes the template independent addition of deoxy- and dideoxynucleoside triphosphates to the 3'-OH ends of double- and single-stranded DNA fragments and oligonucleotides. Terminal Transferase incorporates digoxigenin-, biotin-, and fluorochrome-labeled deoxy- and dideoxynucleoside triphosphates, as well as radioactively labeled deoxy- and dideoxynucleoside triphosphates. The supplied 5x concentrated reaction buffer facilitates optimal tailing of all types of double-stranded DNA ends: blunt ended, with 3' overhang, or with 5' overhang.

EC 2.7.7.31

Properties
The enzyme catalyzes a template-independent addition of dNTPs or of a single ddNTP to the 3'-OH ends of double- or single-stranded DNA.
It accepts radioactively labeled nucleotides and nucleotides labeled with haptens, such as digoxigenin or biotin.
For activity, the enzyme requires the presence of divalent metal ions, preferably Co^{2+}.

Specification
Appearance: Clear, colorless solution
Storage buffer: Potassium phosphate, 60 mmol/l; KCl, 150 mmol/l; 2-mercaptoethanol, 1 mmol/l; Triton X-100, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 7.2 at +4°C
Volume activity (Co^{2+}): ≥400x10^3 U/ml
Specific activity (Co^{2+}): ≥200x10^3 U/mg
Unit definition: One unit is the enzyme activity that leads to an incorporation of 1 nmol
dTMP into acid insoluble products within 30 minutes at +37°C under assay conditions (cacodylate, 200 mmol/l; Co^{2+}, 1 mmol/l) using $d(pT)_6$ as primer.
Unspecific endonucleases (MWM II DNA): Not detectable in up to 400 U after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 400 U after 4 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): ≤0.1%
Function test (tailing reaction on a 30-mer oligonucleotide): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Background Information
The enzyme is shipped without reaction buffer. Please inquire to obtain an optimized buffer system.

Cat. No.	Pack Size
03 289 869 103	custom fill

Will be supplied as "Terminale Transferase, recombi". Unit of Measure is "kU".

DRY ICE

For further processing only.

- For the appropriate divalent metal ion, use Cobalt Chloride Solution, see page 310
- For the best fit reaction buffer, use Terminal Transferase Reaction Buffer, see page 310

Terminal Transferase Reaction Buffer
5x concentrated

Cat. No.	Pack Size
06 280 927 103	1 ml

Reaction buffer for Terminal Transferase, recombinant.

Will be supplied as "React buffer, term.transf., Sar. 1 ml". Unit of Measure is "piece".

DRY ICE

For further processing only.

Application
Use Terminal Transferase Reaction Buffer for optimal results with Roche's Terminal Transferase, recombinant.

Specification
Appearance: Clear, colorless solution
Contents: Potassium cacodylate, 1 mol/l; Tris/HCl, 125 mmol/l; BSA, 1.25 mg/ml; pH 6.6±0.1 at +20°C
pH value (+20°C): 6.50-6.70
Unspecific endonucleases (MWM II DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Performance test (tailing of a 30-mer oligonucleotide): Corresponds to specification
Stability: At -15 to -25°C within specification range for 18 months.

Cobalt Chloride Solution
25 mM solution

Cat. No.	Pack Size
05 895 391 103	1 ml

Cobalt chloride solution for the activation of terminal transferase and other enzymes.

Will be supplied as "Cobalt Chloride Sol., Sarstedt 1 ml". Unit of Measure is "piece".

DRY ICE

For further processing only.

Application
Use Cobalt Chloride Solution as a cofactor for many enzymes.

Specification
Appearance: Clear, reddish solution
Unspecific endonucleases (MWM II DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Performance test (tailing of a 30-mer oligonucleotide): Corresponds to specification
Stability: At -15 to -25°C within specification range for 18 months.

5-Aminoallyl-UTP
powder, lithium salt

Cat. No.	Pack Size
11 230 271 103	custom fill

Will be supplied as "5-Aminoallyl-UTP, Tetra-Li". Unit of Measure is "g".

DRY ICE

For further processing only.

Aminoallyl-modified nucleotides are used for efficient target labeling and a wide variety of dyes and haptens for subsequent post-labeling reactions.

Application
5-Aminoallyl-16-UTP is a substrate for SP6, T3, and T7 RNA polymerase. It can replace UTP in the *in vitro* transcription reaction for RNA labeling.
Linearized template DNA with T7, SP6, or T3 promoter is *in vitro* transcribed with the corresponding RNA polymerases using ATP, GTP, CTP, UTP, and aminoallyl-16-UTP, respectively.
Lacking bulky dye groups, aminoallyl-modified nucleotides are incorporated at extremely high and reproducible levels. Reaction of the amine-modified nucleic acid with an excess of amine-reactive dye or hapten results in high and consistent labeling efficiencies, regardless of the dye or hapten chosen. The two-step labeling method eliminates the need to optimize the labeling reaction.

Benefits
- Generate stronger signals using efficient incorporation of amino groups for post-labeling.
- Label targets with high uniformity and consistency.
- Increase the options for target labels by post-labeling.
- Save time with ready-to-use solutions.

Properties
Nomenclature: 5-Aminoallyl-uridine-5'-triphosphate
Formula: $C_{12}H_{16}N_3O_{15}P_3Li_4$
Molecular weight: 563 D

Specification
Appearance: White powder
5-Aminoallyl-UTP (1 µmol ≙ 9.73 A_{240} units; phosphate buffer, 0.1 mol/l, pH 7.0): ≥90%
Purity (HPLC): ≥75 area%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

5-Aminoallyl-dUTP
powder, lithium salt

Cat. No.	Pack Size
11 115 502 103	custom fill

Will be supplied as "5-Allylamino-2'-deoxy-UTP, Lithium Salt". Unit of Measure is "µmol".

DRY ICE

For further processing only.

Aminoallyl-modified nucleotides are used for efficient target labeling and a wide variety of dyes and haptens for subsequent post-labeling reactions.

Application
5-Aminoallyl-16-dUTP replaces dTTP in labeling reactions using:

- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- T4 and T7 DNA polymerase
- Taq DNA polymerase and reverse transcriptases

Lacking bulky dye groups, aminoallyl-modified nucleotides can be incorporated at extremely high and reproducible levels. Reaction of the amine-modified nucleic acid with an excess of amine-reactive dye or hapten results in high and consistent labeling efficiencies, regardless of the dye or hapten chosen. The two-step labeling method eliminates the need to optimize the labeling reaction.

Benefits
- Generate stronger signals using efficient incorporation of amino groups for post-labeling.
- Label targets with high uniformity and consistency.
- Increase the options for target labels by post-labeling.
- Save time with ready-to-use solutions.

CAS: 1173-82-6

Properties
Nomenclature: 5-Aminoallyl-2'-deoxy-uridine-5'-triphosphate
Formula: $C_{12}H_{16}N_3O_{14}P_3Li_4$
Molecular weight: 547 D

Specification
Appearance: White powder
5-Aminoallyl-dUTP (1 µmol ≙ 9.73 A_{240} units; phosphate buffer, 0.1 mol/l, pH 7.0): ≥90%
Purity (HPLC): ≥75 area%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

5-Aminoallyl-ddUTP
powder, lithium salt

Aminoallyl-modified nucleotides are used for efficient target labeling and a wide variety of dyes and haptens for subsequent post-labeling reactions.

Application
5-Aminoallyl-11-ddUTP is used in 3'-end labeling reactions, serving as a substrate for:

- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- T4 and T7 DNA polymerase
- Taq DNA polymerase and reverse transcriptases

Lacking bulky dye groups, aminoallyl-modified nucleotides are incorporated at extremely high and reproducible levels. Reaction of the amine-modified nucleic acid with an excess of amine-reactive dye or hapten results in high and consistent labeling efficiencies, regardless of the dye or hapten chosen. The two-step labeling method eliminates the need to optimize the labeling reaction.

Benefits
- Generate stronger signals using efficient incorporation of amino groups for post-labeling.
- Label targets with high uniformity and consistency.
- Increase the options for target labels by post-labeling.
- Save time with ready-to-use solutions.

Cat. No.	Pack Size
11 858 114 103	custom fill

Will be supplied as "5'-Aminoallyl-2,3'-ddUTP, Li". Unit of Measure is "g".

DRY ICE

For further processing only.

Properties
Nomenclature: 5-Aminoallyl-2',3'-dideoxy-uridine-5'-triphosphate
Formula: $C_{12}H_{16}N_3O_{13}P_3Li_4$
Molecular weight: 531 D

Specification
Appearance: White to yellowish, crystalline substance
5-Aminoallyl-ddUTP (1 µmol ≙ 9.73 A_{240} units; phosphate buffer, 0.1 mol/l, pH 7.0): ≥85%
Purity (HPLC): ≥70 area%
Stability: At -15 to -25°C within specification range for 12 months. Store dry.

Biotin-11-CTP
10 mM solution

Cat. No.	Pack Size
04 762 924 103	custom fill

Will be supplied as "Biotin-11-CTP". Unit of Measure is "nmol".

DRY ICE

For further processing only.

Biotin-labeled nucleotides are used for the efficient generation of biotinylated targets which can be subsequently captured using streptavidin coated solid phases or detected by streptavidin conjugates.

Application
Biotin-11-CTP is a substrate for SP6, T3, and T7 RNA Polymerase. It can replace CTP in the *in vitro* transcription reaction for RNA labeling.
Double-stranded DNA (*i.e.,* linearized plasmid or cDNA) containing a T7, SP6, or T3 promoter serves as template for *in vitro* transcription with the corresponding RNA polymerase using ATP, GTP, CTP, UTP and Biotin-11-CTP. For a higher and/or more uniform label density Biotin-11-CTP can be used together with Biotin-16-UTP in the *in vitro* transcription reaction.
The labeled RNA can be detected using a fluorescent streptavidin conjugate or by ELISA using a Strepavidin-AP conjugate.

Benefits
- Save time with ready-to-use solutions.

Properties
Nomenclature: Biotin-11-cytidine-5'-triphosphate
Formula: $C_{28}H_{44}N_7O_{17}P_3SNa_2$
Molecular weight: 921.7 D

Specification
Appearance: Clear, colorless solution
Biotin-11-CTP (1 µmol ≙ 9.1 A_{271} units, phosphate buffer, 0.1 mol/l, pH 7.0): 10.0-11.0 mmol/l
Purity (HPLC): 85-100 area%
Function test (incorporation using T7 Polymerase): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Biotin-16-UTP
10 mM solution

Cat. No.	Pack Size
11 413 201 103	custom fill

Will be supplied as "Biotin-16-UTP". Unit of Measure is "nmol".

DRY ICE

For further processing only.

Biotin-labeled nucleotides are used for the efficient generation of biotinylated targets which can be subsequently captured using streptavidin coated solid phases or detected by streptavidin conjugates.

Application
Biotin-16-UTP is a substrate for SP6, T3, and T7 RNA Polymerase. It can replace UTP in the *in vitro* transcription reaction for RNA labeling.
Linearized template DNA with T7, SP6 or T3 promoter is *in vitro* transcribed

with the corresponding RNA polymerases using ATP, GTP, CTP, UTP and Biotin-16-UTP, respectively.
The labeled RNA can be subsequently detected with a fluorescent streptavidin conjugate or by ELISA using a Streptavidin-AP conjugate.

Benefits
- Save time with ready-to-use solutions.

CAS: 86303-26-6

Properties
Nomenclature: Biotin-16-uridine-5'-triphosphate
Formula: $C_{32}H_{48}N_7O_{19}P_3SLi_4$
Molecular weight: 987.5 D

Specification
Appearance: Clear, colorless solution
Biotin-16-UTP (1 µmol ≙ 10.7 A_{240} units, phosphate buffer, 0.1 mol/l, pH 7.0): 10.0-11.0 mmol/l
Purity (HPLC): ≥85 area%
Function test using DIG RNA Labeling Kit (SP6/T7): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Biotin-16-dUTP
20 mM solution

Cat. No.	Pack Size
04 889 665 103	custom fill

Will be supplied as "Biotin-16-dUTP, 20 mM". Unit of Measure is "nmol".

DRY ICE

For further processing only.

Biotin-labeled nucleotides are used for the efficient generation of biotinylated targets which can be subsequently captured using streptavidin coated solid phases or detected by streptavidin conjugates.

Application
Use Biotin-16-dUTP for nonradioactive DNA labeling such as random priming, PCR labeling or nick translation.
Biotin-16-dUTP is used as a substrate for:
- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- Taq DNA polymerase
- Reverse Transcriptase (*e.g.,* Transcriptor)

Biotin-16-dUTP replaces dTTP in the random-primed DNA labeling reaction or in nick translation in a ratio of 35% Biotin-16-dUTP and 65% dTTP, as well as in PCR.
The nucleotide also serves as a substrate for Terminal Transferase in 3'-end labeling.
Biotin labeled DNA can be detected with:
- Streptavidin-alkaline phosphatase conjugate and a chemiluminescent substrate (CSPD, CDP-*Star*) or a color substrate
- Biotin Luminescence Detection Kit

Benefits
- Save time with ready-to-use solutions.

Properties
Nomenclature: Biotin-16-2'-deoxy-uridine-5'-triphosphate
Formula: $C_{32}H_{48}N_7O_{18}P_3SLi_4$
Molecular weight: 971.5 D

Specification
Appearance: Clear, colorless solution

Biotin-16-dUTP (1 µmol ≙ 10.7 A_{240} units, phosphate buffer, 0.1 mol/l, pH 7.0): 20-25 mmol/l
Purity (HPLC): 85-100 area%
Function test using Biotin-High Prime (0.3 pg): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Biotin-16-dUTP
1 mM solution

Cat. No.	Pack Size
11 093 711 103	custom fill

Will be supplied as "Biotin-16-dUTP, Solution". Unit of Measure is "nmol".

DRY ICE

For further processing only.

Biotin-labeled nucleotides are used for the efficient generation of biotinylated targets which can be subsequently captured using streptavidin coated solid phases or detected by streptavidin conjugates.

Application
Use Biotin-16-dUTP for nonradioactive DNA labeling such as random priming, PCR labeling or nick translation.
Biotin-16-dUTP is used as a substrate for:
- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- Taq DNA polymerase
- Reverse Transcriptase (*e.g.,* Transcriptor)

Biotin-16-dUTP replaces dTTP in the random-primed DNA labeling reaction or in nick translation in a ratio of 35% Biotin-16-dUTP and 65% dTTP, as well as in PCR.
The nucleotide also serves as a substrate for Terminal Transferase in 3'-end labeling.
Biotin labeled DNA can be detected with:
- Streptavidin-alkaline phosphatase conjugate and a chemiluminescent substrate (CSPD, CDP-*Star*) or a color substrate
- Biotin Luminescence Detection Kit

Benefits
- Save time with ready-to-use solutions.

Properties
Nomenclature: Biotin-16-2'-deoxy-uridine-5'-triphosphate
Formula: $C_{32}H_{48}N_7O_{18}P_3SLi_4$
Molecular weight: 971.5 D

Specification
Appearance: Clear, colorless solution
Biotin-16-dUTP (1 µmol ≙ 10.7 A_{240} units, phosphate buffer, 0.1 mol/l, pH 7.0): 1.0-1.1 mmol/l
Purity (HPLC): 85-100 area%
Function test using Biotin-High Prime (0.3 pg): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Biotin-16-ddUTP
1 mM solution

Cat. No.	Pack Size
11 431 692 103	custom fill

Will be supplied as "Biotin-16-ddUTP". Unit of Measure is "nmol".

DRY ICE

For further processing only.

Biotin-labeled nucleotides are used for the efficient generation of biotinylated targets which can be subsequently captured using streptavidin coated solid phases or detected by streptavidin conjugates.

Application
Biotin-16-ddUTP is used as a substrate for:
- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)

- T4 DNA polymerase
- Taq DNA polymerase and reverse transcriptase (*e.g.,*Transcriptor)

Biotin-16-ddUTP is preferentially used for 3'-end labeling of oligonucleotides with Terminal Transferase, recombinant.
The biotin-labeled oligonucleotide can be used as a hybridization probe for:

- DNA and RNA transfers
- Colony and plaque screening
- *In situ* hybridization

In addition to common hybridization techniques, biotin-labeled oligonucleotides are specifically useful for screening expression libraries for sequence-specific DNA-binding proteins, for example, transcription factors.
The labeled oligomer can be subsequently detected by ELISA using the Streptavidin-AP conjugate for nucleic acid detection.
Oligonucleotides are enzymatically labeled at their 3' end with Terminal Transferase by incorporation of a single biotin-labeled dideoxyuridine-triphosphate (biotin-ddUTP).

Benefits
- Save time with ready-to-use solutions.

CAS: 422268-45-9

Properties
Nomenclature: Biotin-16-2',3'-dideoxy-uridine-5'-triphosphate
Formula: $C_{32}H_{48}N_7O_{17}P_3SLi_4$
Molecular weight: 955.5 D

Specification
Appearance: Clear, colorless solution
Biotin-16-ddUTP (1 µmol ≙ 10.7 A_{240} units, phosphate buffer, 0.1 mol/l, pH 7.0): 1.0-1.1 mmol/l
Purity (HPLC): 85-100 area%
Function test using DIG Oligonucleotide 3'-End Labeling Kit, 2nd generation (DIG is replaced by Biotin-16-ddUTP): Corresponds to reference
Stability: At -15 to -25°C within specification range for 24 months.

Digoxigenin-11-UTP
10 mM solution

Cat. No.	Pack Size
11 230 409 103	custom fill

Will be supplied as "DIG-11-UTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Digoxigenin-11-UTP is used to label RNA with digoxigenin. DIG-labeling permits fast and sensitive detection without the need of radioactive material.

Application
Use DIG-11-UTP as a substrate for SP6, T3, and T7 RNA polymerases. It replaces UTP in the *in vitro* transcription reaction for DIG labeling of RNA in a ratio of 35:65%. Linearized template DNA with T7, SP6, or T3 promoter is *in vitro* transcribed with the corresponding RNA polymerases using ATP, GTP, CTP, UTP, and DIG-11-UTP, respectively. Labeled RNA can be detected using Anti-Digoxigenin-AP or Fab fragments.

Benefits
- **Eliminate radioactive material from your laboratory.** Only nonhazardous material is required for your assays.
- **Obtain results faster.** The required exposure time is much shorter compared to radioactive assays.
- **Profit from a stable probe.** DIG-labeled probes are stable for more

than a year and can be easily stripped.
- **Take advantage of the large number of published protocols.**

CAS: 186033-10-3

Properties
Nomenclature: Digoxigenin-11-uridine-5'-triphosphate
Formula: $C_{43}H_{61}N_4O_{22}P_3Li_4$
Molecular weight: 1106.7 D
pH stability: Digoxigenin is bound to the nucleotide portion via an alkali-resistant ether linkage. The preparation is stable to 0.1-0.5 M NaOH at +15 to +25°C.

Specification
Appearance: Clear, colorless solution
Digoxigenin-11-UTP (1 µmol ≙ 8.78 A_{290} units, phosphate buffer, 0.1 mol/l, pH 7.0): 10.0-11.0 mmol/l
Purity (HPLC): 85 area%
Function test using Dig RNA Labeling Kit: Corresponds to reference
Stability: At -15 to -25°C within specification range for 18 months.

Quality
Function tested with the DIG RNA Labeling Kit.

Digoxigenin-11-UTP
3.5 mM solution

Digoxigenin-11-UTP is used to label RNA with digoxigenine. DIG-labeling permits fast and sensitive detection without the need of radioactive material.

Application
Use DIG-11-UTP as a substrate for SP6, T3, and T7 RNA polymerases. It replaces UTP in the *in vitro* transcription reaction for DIG labeling of RNA in a ratio of 35:65%. Linearized template DNA with T7, SP6, or T3 promoter is *in vitro* transcribed with the corresponding RNA polymerases using ATP, GTP, CTP, UTP, and DIG-11-UTP, respectively. Labeled RNA can be detected using Anti-Digoxigenin-AP or fab fragments.

Benefits
- **Eliminate radioactive material from your laboratory.** Only nonhazardous material is required for your assays.
- **Obtain results faster.** The required exposure time is much shorter compared to radioactive assays.
- **Profit from a stable probe.** DIG-labeled probes are stable for more than a year and can be easily stripped.
- **Take advantage from the large number of published protocols.**

Properties
Nomenclature: Digoxigenin-11-uridine-5'-triphosphate
Formula: $C_{43}H_{61}N_4O_{22}P_3Li_4$
Molecular weight: 1106.7 D
pH stability: Digoxigenin is bound to the nucleotide portion via an alkali-resistant ether linkage. The preparation is stable to 0.1-0.5 M NaOH at +15 to +25°C.

Specification
Appearance: Clear, colorless solution
Digoxigenin-11-UTP (1 µmol ≙ 8.78 A_{290} units, phosphate buffer, 0.1 mol/l, pH 7.0): 3.3-3.7 mmol/l
Purity (HPLC): 85-100 area%

Cat. No.	Pack Size
03 359 239 103	custom fill

Will be supplied as "Digoxigenin-11-UTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Function test using DIG RNA Labeling Kit: Corresponds to reference
Stability: At -15 to -25°C within specification range for 18 months.

Quality
Function tested with the DIG RNA Labeling Kit.

Digoxigenin-11-dUTP, alkali-stable
1 mM solution

Cat. No.	Pack Size
11 093 681 103	custom fill

Will be supplied as "DIG-11-dUTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Digoxigenin-11-dUTP, alkali-stable, replaces radioactive assays for even higher sensitivity. The required exposure time is drastically reduced compared to radioactive assays.

Application
Use Digoxigenin-11-dUTP, alkali-stable, for nonradioactive DNA labeling (*e.g.,* random priming, PCR labeling, tailing, or nick translation). DIG-11-dUTP replaces dTTP in the random-primed DNA labeling reaction or in nick translation in a ratio of 35% DIG-11-dUTP and 65% dTTP. It is ideal as a substrate for DNA polymerase,Taq DNA polymerase, Terminal Transferase and reverse transcriptase.
Note: For labeling of probes which are preferentially used in hybridization experiments where stripping and reprobing of the membrane is intended, use DIG-11-dUTP, alkali-labile.

Benefits
- **Eliminate radioactive material from your laboratory.** Only nonhazardous material is required for your assays.
- **Obtain results faster.** The required exposure time is much shorter compared to radioactive assays.
- **Profit from a stable probe.** DIG-labeled probes are stable for more than a year and can be easily stripped.
- **Take advantage of the large number of published protocols.**

CAS: 1173-82-6

Properties
Nomenclature: Digoxigenin-11-2'-deoxy-uridine-5'-triphosphate
Formula: $C_{43}H_{61}N_4O_{21}P_3Li_4$
Molecular weight: 1090.7 D

Specification
Appearance: Clear, colorless solution
Digoxigenin-11-dUTP (1 µmol ≙ 8.78 A_{290} units, phosphate buffer, 0.1 mol/l, pH 7.0): 0.9-1.1 mmol/l
Purity (HPLC): 85-100 area%
Function test using DIG DNA Labeling and Detection Kit: Corresponds to reference
Stability: At -15 to -25°C within specification range for 18 months.

Quality
Function tested by RPL.

Digoxigenin-11-dUTP, alkali-labile
1 mM solution

Cat. No.	Pack Size
11 579 541 103	custom fill

Will be supplied as "DIG-11-dUTP, Alkali-labile, Solution". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Digoxigenin-11-dUTP, alkali-labile, is a replacement for radioactive assays for even higher sensitivity. The DIG-label can be cleaved under basic conditions resulting in an unlabeled probe for further processing.

Application
Use Digoxigenin-11-dUTP, alkali-labile, for nonradioactive DNA labeling (*e.g.,* random-primed or nick translation). The alkali-labile compound should be used for labeling of probes which are preferentially used in hybridization experiments where stripping and reprobing of the membrane is intended. DIG-11-dUTP replaces dTTP in the random-primed DNA labeling reaction or in nick translation in a ratio of 35% DIG-11-dUTP and 65% dTTP. It is ideal as a substrate for DNA polymerase, Taq DNA polymerase, Terminal Transferase and reverse transcriptase.
Note: Do not use in experiments where alkaline treatment is required. For this application, use DIG-11-dUTP, alkali-stable.

Benefits
- **Eliminate radioactive material from your laboratory.** Only nonhazardous material is required for your assays.
- **Obtain results faster.** The required exposure time is much shorter compared to radioactive assays.
- **Profit from a stable probe.** DIG-labeled probes are stable for more than a year and can be easily stripped.
- **Obtain the unlabeled fragment after detection.** The DIG-label can be cleaved under basic conditions resulting in an unlabeled probe for further processing.
- **Take advantage of the large number of published protocols.**

CAS: 1173-82-6

Properties
Nomenclature: Digoxigenin-11-2'-deoxy-uridine-5'-triphosphate
Formula: $C_{45}H_{63}N_4O_{22}P_3Li_4$
Molecular weight: 1132.7 D

Specification
Appearance: Clear, colorless solution
Digoxigenin-11-dUTP (1 µmol ≙ 8.78 A_{290} units, phosphate buffer, 0.1 mol/l, pH 7.0): 0.9-1.1 mmol/l
Purity (HPLC): 85-100 area%
Function test using DIG DNA Labeling and Detection Kit: Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Function tested by RPL.

Digoxigenin-11-ddUTP
1 mM solution

Cat. No.	Pack Size
11 365 207 103	custom fill

Will be supplied as "DIG-11-ddUTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Digoxigenin-11-ddUTP permits replacement of radioactive assays for even higher sensitivity. The required exposure time is drastically reduced compared to a radioactive assay.

Application
Use Digoxigenin-11-ddUTP as a substrate for: Terminal Transferase, DNA polymerase I (holoenzyme and Klenow fragment), T4 and T7 DNA polymerase

or Taq DNA polymerase and reverse transcriptase (*e.g.,* Transcriptor). It is preferentially used for 3'-end labeling of oligonucleotides with Terminal Transferase, recombinant. The DIG-labeled oligonucleotide can be used as a hybridization probe for:

- DNA and RNA transfers
- Colony and plaque screening
- *In situ* hybridization

In addition to common hybridization techniques, DIG labeled oligonucleotides are specifically useful for screening expression libraries for sequence specific DNA-binding proteins such as transcription factors.

Benefits

- **Eliminate radioactive material from your laboratory.** Only nonhazardous material is required for your assays.
- **Obtain results faster.** The required exposure time is much shorter compared to radioactive assays.
- **Profit from a stable probe.** DIG-labeled probes are stable for more than a year and can be easily stripped.
- **Take advantage of the large number of published protocols.**

Properties

Nomenclature: Digoxigenin-11-2'-dideoxy-uridine-5'-triphosphate
Formula: $C_{43}H_{61}N_4O_{20}P_3Li_4$
Molecular weight: 1074.7 D

Specification

Appearance: Clear, colorless solution
Digoxigenin-11-ddUTP (1 µmol ≙ 8.78 A_{290} units, phosphate buffer, 0.1 mol/l, pH 7.0): 1.0–1.1 mmol/l
Purity (HPLC): 85–100 area%
Function test using DIG Oligonucleotide 3'-End Labeling Kit, 2nd generation: Corresponds to reference
Stability: At -15 to -25°C within specification range for 24 months.

Quality

Function tested by end labeling.

Fluorescein-12-UTP

10 mM solution

Cat. No.	Pack Size
11 431 706 103	custom fill

Will be supplied as "Fluorescein-12-UTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Enzymatic nonradioactive labeling reagent for *in vitro* transcription reactions.

Application

Use Fluorescein-12-UTP to add a nonradioactive label to RNA during *in vitro* transcription. The labeled RNA can easily and safely be detected either directly or with an enzyme-conjugated anti-fluorescein. Fluorescein-12-UTP can replace UTP as a substrate for the following enzymes:

- SP6 RNA polymerase
- T3 RNA polymerase
- T7 RNA polymerase

Labeled RNA can be subsequently detected by *in situ* hybridization and direct fluorescence detection and detection by ELISA using Anti-Fluorescein-AP, Fab fragments or Anti-Fluorescein-POD, Fab fragments.

Benefits

- **Save time** with a ready-to-use solution for *in situ* hybridization and ELISA.

CAS: 134367-01-4

Properties
Nomenclature: Fluorescein-12-uridine-5'-triphosphate
Formula: $C_{39}H_{37}N_4O_{22}P_3Li_4$
Molecular weight: 1034.4 D

Specification
Appearance: Clear, yellow solution
Fluorescein-12-UTP (1 µmol ≙ 63.3 A_{495} units, phosphate buffer, 0.1 mol/l, pH 9.0): 10.0-11.0 mmol/l
Purity (HPLC, including isomere): >85-100 area%
Function test using DIG RNA Labeling Kit (SP6/T7) (DIG is replaced by Fluorescein-12-UTP): Corresponds to reference
Ribonucleases: Negative
Stability: At -15 to -25°C within specification range for 12 months. Store dry and protect from light.

Fluorescein-12-dUTP
1 mM solution

Enzymatic nonradioactive labeling reagent for cDNA synthesis, PCR, random primed labeling, nick-translation or primer extension.

Cat. No.	Pack Size
11 375 601 103	custom fill

Will be supplied as "Fluorescein-12-dUTP". Unit of Measure is "nmol".
For other than the listed concentrations please inquire.

DRY ICE

For further processing only.

Application
Use Fluorescein-12-dUTP as a substrate for:
- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- Taq DNA polymerase
- Reverse transcriptase (*e.g.,* from AMV and M-MuLV)

Fluorescein-12-dUTP replaces dTTP in the random-primed DNA labeling reaction or in nick translation reactions, as well as in PCR. The nucleotide also serves as a substrate for Terminal Transferase in 3'-end labeling.
Fluorescein-labeled probes can be used for *in situ* hybridization with direct fluorescence detection and detection by ELISA using Anti-Fluorescein-AP, Fab fragments.
Repeated fluorescence labeling using Tetramethylrhodamine-6-dUTP (red) and AMCA-6-dUTP (bright blue) is possible.

Benefits
- **Save time** with a ready-to-use solution for *in situ* hybridization and ELISA.
- **Be flexible.** The Fluorescein-12-dUTP labeled samples can be co-labeled using either Tetramethylrhodamine-dUTP or AMCA-6-dUTP.

CAS: 134344-32-4

Properties
Nomenclature: Fluorescein-12-deoxyuridine-5'-triphosphate
Formula: $C_{39}H_{37}N_4O_{21}P_3Li_4$
Molecular weight: 1018.4 D

Specification
Appearance: Clear, yellow solution
Fluorescein-12-dUTP (1 µmol ≙ 63.3 A_{495} units, phosphate buffer, 0.1 mol/l, pH 9.0): 1.0-1.1 mmol/l
Purity (HPLC, including isomere): >85-100 area%
Function test using *In Situ* Cell Death Detection Kit, Fluorescein (*in situ* hybridization): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months. Store dry and protect from light.

Tetramethylrhodamine-5-dUTP

1 mM solution, lithium salt

Tetramethylrhodamine-5-dUTP is a substitute for dTTP in nick-translation and in the random-primed labeling reactions.

Application

Tetramethylrhodamine-5-dUTP is used for nonradioactive labeling of DNA. This modified nucleotide is a substrate for:

- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- Taq DNA polymerase
- Reverse transcriptase (*e.g.,* Transcriptor Reverse Transcriptase and other reverse transcriptases)

Benefits

- Benefit from a hazard free labeling and detection system without the risks associated with radioactive assays.
- Profit from directly measuring the fluorescense for *in situ* hybridization.

Product Description

Tetramethylrhodamine-5-dUTP is a substitute for dTTP in nick-translation reactions and in the random-primed labeling technique for DNA labeling, as well as in PCR. The nucleotide also serves as a substrate for Terminal Transferase in 3'-end labeling. Tetramethylrhodamine-labeled probes show red fluorescence and are suitable for use in *in situ* hybridization for direct fluorescence detection. Multiple fluorescence labeling using Fluorescein-12-dUTP (yellow fluorescence) or other dye-labeled deoxynucleotides is possible.

Properties

Formula: $C_{37}H_{36}N_5O_{18}P_3Li_4$
Molecular weight: 959.4 D

Specification

Appearance: Clear, red solution
Tetramethylrhodamine-5-dUTP (1 µmol ≙ 70.0 A_{551} units, phosphate buffer, 0.1 mol/l, pH 9.0): 1.0–1.1 mmol/l
Purity (HPLC): 85.0–100.0 area%
Function test (*in situ* hybridization): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months. Protect from light.

Cat. No.	Pack Size
11 542 907 103	custom fill

Will be supplied as "Tetramethylrhodamine-5-dUTP". Unit of Measure is "nmol".

For further processing only.

COT Human DNA, CGH Grade

from human male placenta DNA, enriched for repetitive sequences, solution

Cat. No.	Pack Size
05 111 854 103	custom fill

Will be supplied as "COT Human DNA, CGH Grade". Unit of Measure is "ml".

DRY ICE

For further processing only.

Obtain best results for *in situ* suppression (CISS) hybridization, DNA microarray application and many other hybridization applications. With the COT Human DNA, CGH Grade, reproducible and sensitive measurements of dsDNA concentration are possible.

Application

Use the COT Human DNA in the following applications:

- Nucleic acid labeling and detection
- DNA microarray applications such as comparative genome hybridization and sequence capture
- Complex hybridization of human nucleic acids like FISH

In microarray applications, COT Human DNA is used in hybridization solutions to block repetitive DNA sample sequences from nonspecific hybridizations. In filter and other hybridization techniques, COT Human DNA is also used in prehybridization solutions to inactivate nonspecific target binding sites.

Benefits

- Ensure specificity by blocking unspecific nucleic acid motifs using high concentrations of double-stranded, repetitive (COT) human DNA.
- Achieve reproducible, reliable results using fluorometrically quantified COT human DNA, when hybridizing to complex dsDNA.
- Use COT Human DNA that has been pretested using DNA microarrays and comparative genome hybridization (CGH).
- Suppress the background noise effectively in your experiments using high concentrations of repetitive dsDNA.

Product Description

The COT fraction of human genomic DNA consists largely of rapidly annealing repetitive elements. These interspersed repetitive sequences (IRS) such as SINEs (small interspersed repetitive elements, *e.g.*, Alu-elements) and LINEs (large interspersed repetitive elements, *e.g.,* L1-elements) are distributed ubiquitously throughout the genome. COT Human DNA is prepared from human placental DNA by shearing, denaturing, and reannealing under conditions that enrich these repetitive elements.

CAS: 99675-55-5

Specification

Appearance: Clear, colorless solution
COT Human DNA (A_{260}, water, 1 AB=50 µg/ml): ≥1.0 mg/ml
Fluorometrical determination of concentration: 1.0-1.5 mg/ml
Y-Chromosom (recovered exclusively from male human placenta): Corresponds to specification
A_{260}/A_{280}: 1.6-2.0
Absence of HIV 1/2 and HCV/HBV: Corresponds to specification
Performance test using gel electrophoretic separation (4% agarose gel without RE cleavage): middle chain length: 50-300 bp
Comparable intensity to previous lot: Corresponds to specification
Function test in the CGH array: Corresponds to specification
Stability: At -15 to -25°C within specification range for 18 months.

Quality

The product is HIV tested.

Background Information

Repetitive elements (IRS) present in a probe (*e.g.,* cosmids, YACs, chromosome painting probes) generate nonspecific hybridization signals that are distributed

over the whole chromosome or genome. To enable specific hybridization of the probe to the chromosomal target site (*e.g.,* single-copy sequences or low-copy repeats), the probe must be denatured in the presence of excess unlabeled COT Human DNA. This DNA serves as a competitor. In a subsequent preannealing step, the repetitive probe elements rapidly hybridize to excess repeats in the Cot Human DNA, while most of the specific probe sequences remain single stranded, and can thus hybridize to their chromosomal targets. This technique is known as chromosomal *in situ* suppression (CISS) hybridization.

COT Human DNA

from human placenta DNA, enriched for repetitive sequences, solution

For suppression of cross-hybridization to human repetitive sequences in filter and *in situ* hybridizations.

Cat. No.	Pack Size
11 582 011 103	custom fill

Will be supplied as "DNA,Cot-1,human". Unit of Measure is "mg".

DRY ICE

For further processing only.

Application

COT Human DNA is used in chromosome *in situ* suppression (CISS) hybridization. Cosmid or YAC probes contain repetitive elements that result in monospecific hybridization signals distributed over the entire chromosome. To enable specific hybridization to the chromosomal target site, the probe is denatured together with an excess of unlabeled COT Human DNA as a competitor. COT Human DNA can be used to suppress nonspecific hybridization to human repetitive sequences in microarray analysis, and in filter and *in situ* hybridization experiments.

Benefits

- Rely on the effective suppression due to the high concentration of repetitive dsDNA.

Product Description

The COT fraction of human genomic DNA consists largely of rapidly annealing repetitive elements. These interspersed repetitive sequences (IRS) such as SINEs (small interspersed repetitive elements, *e.g.*, Alu-elements) and LINEs (large interspersed repetitive elements, *e.g.,* L1-elements) are distributed ubiquitously throughout the genome. COT Human DNA is prepared from human placental DNA by shearing, denaturing, and reannealing under conditions that enrich these repetitive elements.

CAS: 99675-55-5

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 10 mmol/l; EDTA, 1 mmol/l; pH 7.4
COT Human DNA (A_{260}, water): 1.0–2.0 mg/ml
Y-Chromosom (recovered exclusively from male human placenta): Corresponds to specification
A_{260}/A_{280}: 1.6–2.0
Absence of HIV 1/2 and HCV/HBV: Corresponds to specification
Performance test using gel electrophoretic separation (4% agarose gel, without RE cleavage): middle chain length: 50-300 bp
Comparable intensity of Cot 1 DNA to masterlot: Corresponds to specification
Stability: At -15 to -25°C within specification range for 18 months.

Quality

The product is HIV tested.

DNA
from fish sperm, solution

Cat. No.	Pack Size
10 223 638 103	custom fill

Will be supplied as "DNA, Sodium Salt from fish sperm". Unit of Measure is "g".
For further processing only.

This DNA preparation can serve for prevention of nonspecific binding in hybridization experiments.

Application
Use this preparation of single-stranded genomic DNA fragments to prevent nonspecific binding in membrane or *in situ* DNA hybridization experiments. It can be added directly to the hybridization mix with no need for prior sonification or denaturation.

CAS: 9007-49-2

Properties
The DNA is sonicated. The length of the DNA fragments is mostly in the range of 50 to 600 bp (not verified). UV absorption maximum is at 258 nm.

Specification
Appearance: White to slightly grey lyophilizate
DNA content (A_{260}): ≥15 AB/mg lyophilizate
DNA content (based on $P_{organic}$): ≥70% of lyophilizate
$P_{organic}$ (P_{total}-P_i): ≥60 µg/mg lyophilizate
P_i: ≤3 µg/mg lyophilizate
Na (flame photometric): 6±2%
Protein content (Lowry): ≤50 µg/mg lyophilizate
Stability: At +2 to +8°C within specification range for 12 months.

Poly [d(A-T)]
powder

Cat. No.	Pack Size
11 336 312 103	50 OD[260] units

Will be supplied as "Poly[d(A-T)], Sodium Salt". Unit of Measure is "piece".
DRY ICE
For further processing only.

Poly[d(A-T)] is a suitable template for RNA synthesis.

Application
Use Poly[d(A-T)] as a template for RNA polymerases.

Specification
Appearance: White lyophilizate
Melting range: 62.0-69.0°C
Content (A_{260}, content of one vial resolved in 1 ml water): 50-60 OD/ml
Mean strand length (gel electrophoresis): 500-100,000 bp
Ratio dA/dT: 1:1±10%
A_{250}/A_{260}: 0.70-0.76
A_{280}/A_{260}: 0.38-0.58
A_{290}/A_{260}: 0.09-0.16
Stability: At -15 to -25°C within specification range for 24 months.

RNA
from yeast, powder, free acid

Cat. No.	Pack Size
10 153 320 103	custom fill

Will be supplied as "RNA from Yeast". Unit of Measure is "g".
For further processing only.

This product is a preparation of total RNA.

Application
Use this RNA preparation for studies which use natural RNA in a *in vivo* and *in vitro* protein-synthesizing system. It can also be used as carrier RNA in *in situ* hybridization experiments.

CAS: 63231-63-0

Properties
Total RNA from *Saccharomyces cerevisiae.*

Specification
Appearance: Yellowish to brown powder
Purity (A_{260}): ≥95.0%
P_i: ≤0.3%
A_{250}/A_{260}: 0.86-0.92
A_{280}/A_{260}: 0.44-0.48
A_{290}/A_{260}: 0.15-0.19
Stability: At +15 to +25°C within specification range for 24 months.

Poly(A)
potassium salt, solution

Cat. No.	Pack Size
12 159 074 103	custom fill

Will be supplied as "Poly (A) Potassium Salt, Solution". Unit of Measure is "g".

For further processing only.

Poly(A) supports precipitation of DNA and RNA.

Application
Use Poly(A) as a carrier for quantitative precipitation of DNA and RNA.

CAS: 26763-19-9

Properties
Poly(A) is a suitable carrier for quantitative precipitation of DNA and RNA, especially to improve recovery of low amounts of nucleic acid or of short fragments <200 bp.
Molecular weight: 100-500 kD

Specification
Appearance: Clear, colorless solution
pH value: 6.5±0.5
Content (A_{257}): 4.5-5.5 mg/ml
Mean strand length (gel electrophoresis): 3,000-10,000 nucleotides
Ribonucleases (fluorescence polarisation): Negative
A_{250}/A_{260}: 0.86-0.90
A_{280}/A_{260}: 0.28-0.32
A_{290}/A_{260}: 0.03-0.05
Stability: At -15 to -25°C within specification range for 36 months.

Poly(A)
potassium salt, lyophilizate

Poly(A) supports precipitation of DNA and RNA.

Application
Use Poly(A) as a carrier for quantitative precipitation of DNA and RNA.

CAS: 26763-19-9

Properties
Poly(A) is a suitable carrier for quantitative precipitation of DNA and RNA, especially to improve recovery of low amounts of nucleic acid or of short fragments <200 bp.
Molecular weight: 100-500 kD

Specification
Appearance: White lyophilizate
Content (A_{257}): 2.1 µmol/mg
Mean strand length (gel electrophoresis): 2,100-10,000 nucleotides
Ribonucleases (fluorescence polarization): Negative
$\mathbf{A_{250}/A_{260}}$: 0.86-0.90
$\mathbf{A_{280}/A_{260}}$: 0.28-0.32
$\mathbf{A_{290}/A_{260}}$: 0.03-0.05
Stability: At +2 to +8°C within specification range for 36 months.

Cat. No.	Pack Size
10 041 955 103	1 g

Will be supplied as "Polyadenylic Acid, Poly (A), K-Salt". Unit of Measure is "g".
For further processing only.

Glycogen, Molecular Biology Grade
from mussels, solution

Glycogen, Molecular Biology Grade, supports precipitation of DNA and RNA.

Application
Use Glycogen, Molecular Biology Grade, as a carrier for quantitative precipitation of DNA and RNA.

Benefits
- **Gain excellent performance.** Take advantage of a contamination-controlled reagent with high lot-to-lot consistency.

CAS: 9005-79-2

Properties
Glycogen, Molecular Biology Grade, is a suitable carrier for DNA and RNA in ethanol precipitation and phenol/chloroform extraction, especially to increase sensitivity with low amounts of total nucleic acid. In contrast to carrier DNA and RNA, glycogen is inert in nucleic acid modifying processes. It has no influence on enzymatic treatment of nucleic acids or on gel electrophoresis. Glycogen does not bind to nucleic acids, and can be easily removed by gel electrophoresis or gel filtration.

Specification
Appearance: Clear, colorless solution
Concentration: ≥20 mg/ml
Unspecific endonucleases (λDNA and MWM III DNA): Not detectable in up to 200 µg after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 200 µg after 4 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 200 µg after 4 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 200 µg after 4 hours incubation at +37°C.
Proteinases (colorimetric): Not detectable in up to 200 µg after 2 hours incubation at +37°C.
Nucleic acid (gel electrophoresis): Not detectable in up to 200 µg
Stability: At -15 to -25°C within specification range for 36 months.

Cat. No.	Pack Size
10 899 232 103	custom fill

Will be supplied as "Glycogen, from Mussels SQ for Mol.Biol.".
Unit of Measure is "g".

For further processing only.

Alkaline Phosphatase, recombinant, 1 U/µl

from bovine intestine, expressed in *Pichia pastoris*, solution

Alkaline Phosphatase for 5' dephosphorylation of DNA and RNA.

Application

Use Alkalkine Phosphatase, recombinant, 1 U/µl for:

- Dephosphorylation of 5' phosphate from DNA and RNA
- Coupling to other proteins via its amino or carbohydrate groups, for detection in immunoassays and western blot analysis. The increased heat instability of the recombinant enzyme allows quick deactivation by heating after dephosphorylation

Benefits

- **Rely on fast end efficient performance.** Recombinant AP allows fast dephosphorylation and quick deactivation.
- **Gain excellent performance.** Take advantage of this highly processive Alkaline Phosphatase, recombinant, 1 U/µl, specifically tested for molecular biology applications.

EC 3.1.3.1

Properties

Enzyme activity: Alkaline Phosphatase, recombinant, 1 U/µl catalyzes the dephosphorylation of 5' phosphate from DNA and RNA.
pH activity optimum: 9.8
pH stability optimum: 8.0
Cofactor: Zn^{2+}
Aktivators: Mg^{2+}, Mn^{2+}, Co^{2+}
Inactivation: Complete inactivation after 5 minutes at +75°C.

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 25 mmol/l; $MgCl_2$, 1 mmol/l; $ZnCl_2$, 0.1 mmol/l; glycerol, 50% (v/v), pH approximately 7.6 at +4°C
Volume activity: ≥1 U/µl
Specific activity: ≥5 kU/mg protein
Unit determination: Photometric test with 4-nitrophenyl phosphate
Unspecific endonucleases (λDNA): Not detectable in up to 100 U after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 100 U after 4 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 60 U after 4 hours incubation at +37°C. **Ribonucleases** (MS2 RNA): Not detectable in up to 100 U after 1 hour incubation at +37°C. **Function test, 5' labeling** (MWM III DNA, incorporation rate ≥30%): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
04 571 550 103	custom fill

Will be supplied as "Alkaline Phosphatase rec., MB Grade, 1 U".
Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use Dephosphorylation Buffer for Alkaline Phosphatase, see page 331

Alkaline Phosphatase, recombinant, 20 U/µl

from bovine intestine, expressed in *Pichia pastoris*, solution

Alkaline Phosphatase for 5' dephosphorylation of DNA and RNA.

Application

Use Alkalkine Phosphatase, recombinant for:

- Dephosphorylation of 5' phosphate from DNA and RNA
- Coupling to other proteins via its amino or carbohydrate groups, for detection in immunoassays and western blot analysis

Benefits

- **Gain excellent performance.** Take advantage of this highly processive, contamination-controlled Alkaline Phosphatase, recombinant.

EC 3.1.3.1

Properties

Enzyme activity: Alkaline Phosphatase, recombinant, 1 U/µl catalyzes the dephosphorylation of 5' phosphate from DNA and RNA.
pH activity optimum: 9.8
pH stability optimum: 8.0
Cofactor: Zn^{2+}
Aktivators: Mg^{2+}, Mn^{2+}, Co^{2+}
Inactivation: Complete inactivation after 5 minutes at +75°C.

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 25 mmol/l; $MgCl_2$, 1 mmol/l; $ZnCl_2$, 0.1 mmol/l; glycerol, 50% (v/v); pH approximately 7.6 at +4°C
Volume activity: ≥20 U/µl
Specific activity: ≥5 kU/mg protein
Unit determination: Photometric test with 4-nitrophenyl phosphate.
Unspecific endonucleases (λDNA): Not detectable in up to 100 U after 4 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 100 U after 4 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 60 U after 4 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 100 U after 1 hour incubation at +37°C.
Function test, 5' labeling (MWM III DNA, incorporation rate ≥30%): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
04 571 363 103	custom fill

Will be supplied as "Alkaline Phosphatase rec., MB Grade, 20 U".
Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use Dephosphorylation Buffer for Alkaline Phosphatase, see page 331

Dephosphorylation Buffer for Alkaline Phosphatase

10x concentrated

Standard reaction buffer for Alkaline Phosphatase.

Application

Use Dephosphorylation Buffer for Alkaline Phosphatase as optimized reaction buffer for Alkaline Phosphatase, recombinant, 1 U/µl.

Benefits

- **Simplify reaction setup.** Use this premixed, pH-adjusted and contamination-controlled standard reaction buffer for fast and easy setup of highly reproducible experiments.
- **Gain excellent performance.** Take full advantage of this Dephosphorylation Buffer for Alkaline Phosphatase, using it as reaction buffer specially optimized for Alkaline Phosphatase, recombinant, 1 U/µl.

Specification

Appearance: Clear, colorless solution
Contents: 10x concentrated solution, comprising Tris/HCl, 500 mmol/l; EDTA, 1 mmol/l; pH approximately 8.5 at +20°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µl after 16 hours incubation at +37°C.
Ribonucleases (MWM II RNA): Not detectable in up to 20 µl after 1 hour incubation at +50°C.
Performance test (5' labeling on MWM III DNA, incorporation rate ≥30%): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
05 989 639 103	1 ml

Will be supplied as "Dephosphorylation Buffer, AP (10x), 1 ml".
Unit of Measure is "piece".
For further processing only.

T4 DNA Ligase

recombinant form of the enzyme from T4 phage, solution

Use T4 DNA Ligase for ligation of DNA fragments.

Application

Use T4 DNA Ligase to ligate DNA fragments with blunt or overlapping ends.

Benefits

- **Obtain consistent performance.** Take advantage of this highly processive, contamination-controlled T4 DNA Ligase.

EC 6.5.1.1

Properties

Enzyme activities: T4 DNA Ligase catalyzes the formation of phosphodiester bonds between neighbouring 3'-hydroxyl and 5'-phosphate ends in double-stranded DNA. Sticky- and blunt-ended DNA fragments are ligated. Single-stranded nicks in double-stranded DNA are also closed.
Appropriate ligation buffer, 10x concentrated: Tris/HCl, 660 mmol/l; $MgCl_2$, 50 mmol/l; DTT, 50 mmol/l; ATP, 10 mmol/l, pH 7.5 at +20°C (Note: ATP is not stable).
pH optimum: 7.2–7.8
Divalent ion requirement: Mg^{2+}
Inactivation: After 10 minutes heat denaturation at +65°C ligase activity is stopped.

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/l; KCl, 60 mmol/l; DTE, 5 mmol/l; EDTA, 1 mmol/l; glycerol, 50% (v/v); pH approximately 7.5 at +4°C
Volume activity: ≥5 U/µl
Unit definition: One unit T4 DNA Ligase is defined as the amount of enzyme which converts 1 nmol of [^{32}P] from pyrophosphate into Norit-absorbable material in 20 minutes at +37°C.
Glycosylases (M13mp11(U) ssDNA): Not detectable in up to 10 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 10 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 15 U after 4 hours incubation at +37°C.
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 18 months.

Cat. No.	Pack Size
10 909 246 103	custom fill

Will be supplied as "DNA Ligase, T4 from T4-infected EcoNM989".
Unit of Measure is "kU".
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Pyrophosphatase, inorganic (PPase)
from yeast

Pyrophosphatase, inorganic (PPase) catalyzes the hydrolysis of inorganic pyrophosphate to form orthophosphate.

Application
Pyrophosphatase, inorganic (PPase) enhances enzymatic reactions producing pyrophosphate, since these reactions typically have equilibrium constants and are inhibited by the generated pyrophosphate.

EC 3.6.1.1

Properties
Molecular weight: 63 kD
Cofactor: Mg^{2+} is required for enzymatic activity.
Isoelectric point: pH 4.8

Specification
Appearance: White suspension
Storage solution: Ammonium sulfate, 3.2 mol/l; pH approximately 6.0
Specific activity: ≥200 U/mg
Unit definition: One unit Pyrophosphatase, inorganic (PPase) generates 1.6 µmol orthophosphate per minute at +25°C by hydrolysis of inorganic pyrophosphate.
Standardized concentration: 5.0±0.5 mg/ml
Contaminating activities (as percentage of PPase activity):
Phosphatase: ≤0.01%
ATPase: ≤0.01%
Stability: At +2 to +8°C within specification range for 36 months.

Cat. No.	Pack Size
10 150 681 103	custom fill

Will be supplied as "Pyrophosphatase, Inorganic (PPase), Yeast".
Unit of Measure is "g".
For further processing only.

Bovine Serum Albumin, Molecular Biology Grade

2% solution

Bovine Serum Albumin, Molecular Biology Grade, supports enzyme stability.

Application

Use Bovine Serum Albumin, Molecular Biology Grade, for enzyme stabilization and for dilution of nucleic acid modifying enzymes.

Benefits

- **Gain excellent performance.** Take advantage of a contamination-controlled reagent with high lot-to-lot consistency.

CAS: 9048-46-8

Properties

Special quality for molecular biology
Molecular weight: 63 kD

Specification

Appearance: Clear, yellowish solution
Storage buffer: Tris/HCl, 50 mmol/l; NaCl, 100 mmol/l; 2-mercaptoethanol, 1 mmol/l; EDTA, 0.25 mmol/l; glycerol, 50% (v/v); pH approximately 7.5 at +25°C
Protein concentration (A_{280}, 1 mg/ml ≙ 0.67 OD): ≥20 mg/ml
Unspecific endonucleases (λDNA): Not detectable in up to 0.75 mg/ml after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 0.75 mg/ml after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 0.75 mg/ml after 4 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 1 mg/ml after 4 hours incubation at +37°C.
Proteinases (colorimetric): Not detectable in up to 0.75 mg/ml after 2 hours incubation at +37°C.
pH ≤5.5 treatment (≥30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Quality

Prepared of bovine plasma from USA with official veterinary's certificate of health of the donor animals and of the deactivation of animal material at pH ≤5.5 for ≥30 minutes.

Cat. No.	Pack Size
10 715 859 103	custom fill

Will be supplied as "Albumin,(BSA) SQ for Molecular Biology".
Unit of Measure is "g".

DRY ICE

For further processing only.

Bovine Serum Albumin, Molecular Biology Grade

10% solution

Bovine Serum Albumin, Molecular Biology Grade, supports enzyme stability.

Application

Use Bovine Serum Albumin, Molecular Biology Grade, for enzyme stabilization and for dilution of nucleic acid modifying enzymes.

Benefits

- **Gain excellent performance.** Take advantage of a contamination-controlled reagent with high lot-to-lot consistency.

CAS: 9048-46-8

Properties

Special quality for molecular biology
Molecular weight: 63 kD

Specification

Appearance: Clear, yellowish solution
Storage buffer: Tris/HCl, 50 mmol/l; NaCl, 100 mmol/l; DTT, 1 mmol/l; EDTA, 0.25 mmol/l; glycerol, 50% (v/v); pH approximately 7.5 at +25°C
Protein concentration (A_{280}, 1 mg/ml ≙ 0.67 OD): 100±5 mg/ml
Unspecific endonucleases (λDNA): Not detectable in up to 0.75 mg/ml after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 0.75 mg/ml after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 0.75 mg/ml after 4 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 1 mg/ml after 4 hours incubation at +37°C.
Proteinases (colorimetric): Not detectable in up to 0.75 mg/ml
pH ≤5.5 treatment (≥30 minutes): Corresponds to specification
Country of origin: USA
Stability: At -15 to -25°C within specification range for 12 months.

Quality

Prepared of bovine plasma from USA with official veterinary's certificate of health of the donor animals and of the deactivation of animal material at pH ≤5.5 for ≥30 minutes.

Cat. No.	Pack Size
05 931 665 103	1000 ml

Will be supplied as "Albumin Bovine Plasma, 10%, Mol Biol Grd".
Unit of Measure is "ml".
For further processing only.

Blocking Reagent
powder

Cat. No.	Pack Size
10 057 177 103	custom fill

Will be supplied as "Blocking Reagent". Unit of Measure is "kg".
For further processing only.

Blocking Reagent for nonradioactive filter hybridization and the detection of nucleic acid hybrids, especially for the Roche DIG system.

Application
Use Blocking Reagent to decrease the background in nonradioactive filter hybridization and the detection of nucleic acid hybrids.

Benefits
- **Obtain reliable results.** The Blocking Reagent is perfectly suited for the Roche DIG system.

Specification
Appearance: White, fine-grained powder
Solubility:
Clear, opalescent solution in buffer with 50% formamide (5% [w/v])
Clear, opalescent solution in maleic acid, 0.1 mol/l; NaCl, 0.15 mol/l; pH 7.5 at +20°C (10% [w/v])
Clear, opalescent solution in Tris/HCl, 0.1 mol/l; NaCl, 0.15 mol/l; pH 7.5 at +20°C (5% [w/v])
DNases/RNases: Negative
Nicking activity: Negative
Function test: Hybridization and detection of homologouse RNA using DIG Detection System: Corresponds to specification
Stability: At +15 to +25°C within specification range for 24 months.

Histone H3
from calf thymus, lyophilizate

Cat. No.	Pack Size
11 039 202 103	custom fill

Will be supplied as "Histone H3 from Calf Thymus". Unit of Measure is "mg".
For further processing only.

Histone H3 forms complexes with DNA and can be of interest in studies of DNA-protein interactions.

Application
Use Histone H3 in studies of DNA-protein interactions, in investigations on structure and function of chromatin, and as substrate for protein kinases.

Properties
Histone H3 is electrophoretically homogeneous.
Molecular weight: 15.3 kD

Specification
Appearance: White lyophilizate
Solubility: Clear, colorless solution in water (c=1 mg/ml)
Proteincontent: ≥1 mg protein/mg lyophilizate
Purity (SDS gel electrophoresis): ≥95%
pH <5.5 treatment (≥30 minutes): Corresponds to reference
Stability: At +2 to +8°C within specification range for 24 months.

Quality
Prepared of calf thymus from *Belorussia* with official veterinary's certificate of health of the donor animals and of the deactivation of animal material at pH ≤5.5 for ≥30 minutes.


WAGNER TOBIAS
Roche
Chromaflow

4 Pharma Biotech

Liberase MNP-S

lyophilizate, sterile acc. to Ph. Eur.

Liberase MNP-S is a highly purified enzyme blend for tissue dissociation where high purity, consistent quality, low levels of bacterial endotoxins and a sterile product (STERILE A) are required for reproducible high cell yield and viability.

Application

Use Liberase MNP-S for *in vitro* enzymatic dissociation of tissue, to isolate single cells from a broad range of tissue types. In particular intended for use in isolation of tissue based stem cells and chondrocytes from cartilage.

Benefits

- **Increase safety.** Liberase MNP-S is manufactured free of mammalian and avian tissue-derived raw materials.
- **Maximize viability and yield of isolated cells** due to reduced clostripain and trypsin activity, as well as reduced endotoxin content.
- **Save time and resources** with high experimental reproducibility due to higher lot-to-lot consistency.
- **Count on higher specific activity of these enzyme blends** due to higher Collagenase I + II purity as determined by HPLC analysis.

Product Description

Liberase MNP-S contains highly purified collagenase class I and class II from *Clostridium histolyticum*. The two collagenase isoforms are blended in a precise ratio with each other and with a medium concentration of highly purified thermolysin, a neutral protease isolated from *Bacillus thermoproteolyticus*. The blend is classified STERILE A according to European Pharmacopoeia.
A product manufactured in accordance with current Good Manufacturing Practice (cGMP) is available upon request.

EC 3.4.24.-

Specification (for 5 mg pack size)

Appearance: White lyophilized cake
Total protein content: 41.5-62.3 mg/bottle (target: 51.9 mg protein)
Collagenase I b, c part of collagenase I: ≤40 area%
Collagenase I content: 16.8-25.2 mg/bottle (target: 21.0 mg protein)
Collagenase II content: 11.2-16.8 mg/bottle (target: 14.0 mg protein)
Thermolysin/neutral protease content: 13.5-20.3 mg/bottle (target: 16.9 mg protein)
Activity (Wünsch, calculated): 142-237 U/bottle
Activity (thermolysin/neutral protease, calculated): 147,030-275,000 U/bottle
Ratio collagenase II/total collagenase: 0.3-0.5
Endotoxin: ≤50 EU/mg protein
Sterility (according to European Pharmacopoeia, current version): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 578 582 001	5 mg
05 578 566 001	35 mg

Will be supplied as "Liberase MNP-S". Unit of Measure is "piece".

DRY ICE

Blended Proteolytic Enzyme for Tissue Dissociation. For evaluation purposes only.

Liberase MTF C/T, GMP Grade

0.2µm filtered, lyophilizate

Liberase MTF C/T GMP Grade kit is a highly purified enzyme blend for tissue dissociation where high purity, consistent quality and low levels of bacterial endotoxins are required in achieving reproducible high cell yield and viability.

Application

Use the Liberase MTF C/T, GMP Grade kit for *in vitro* enzymatic dissociation of tissue, to isolate single cells. In particular intended for use in isolation procedures of pancreatic islets from human and pig.

Benefits

- **Increase safety.** Liberase MTF C/T, GMP Grade, is manufactured free of mammalian and avian tissue-derived raw materials.
- **Maximize viability and yield of isolated cells** due to reduced clostripain and trypsin activity, as well as reduced endotoxin content.
- **Save time and resources** with high experimental reproducibility due to higher lot-to-lot consistency.
- **Count on higher specific activity of these enzyme blends** due to higher Collagenase I + II purity as determined by HPLC analysis.

Product Description

Liberase MTF C/T, GMP Grade kit contains highly purified collagenase class I and class II from *Clostridium histolyticum*. The two collagenase isoforms are blended in a precise ratio with each other. Highly purified thermolysin from *Bacillus thermoproteolyticus* is provided in a separate vial to allow individual adjustments of enzyme ratios for optimization of your tissue dissociation protocol.

EC 3.4.24.-

Specification

I. Collagenase I/II MTF Blend (≥2,000 U)
Appearance: White lyophilized cake
Protein content: 430-644 mg (target: 537 mg protein)
Collagenase I content: 258-386 mg (target: 322 mg protein)
Collagenase II content: 172-258 mg (target: 215 mg protein)
Collagenase I b, c part of Collagenase I: ≤10 area%
Purity (HPLC, total peak areas of Col I + Col II): ≥85%
Activity (Wünsch, calculated): 2,172-3,617 U/vial
Ratio collagenase II/total collagenase (HPLC): 0.3-0.5
Bioburden: ≤10 CFU/bottle
Endotoxins: ≤10 EU/mg protein

II. Thermolysin MTF (15 mg)
Appearance: White lyophilized cake
Protein content: 12.0-18.0 mg (target: 15.0 mg protein)
Activity neutral protease (calculated): 130,500-234,000 U/vial
Purity (HPLC, total peak area thermolysin): ≥85%
Bioburden: ≤10 CFU/bottle
Endotoxins: ≤50 EU/mg protein
Stability: At -15 to -25°C within specification range for 12 months.

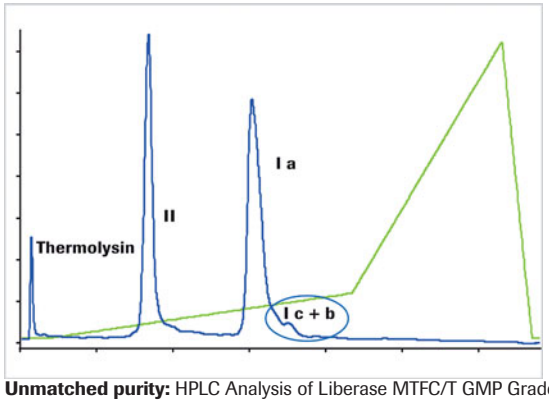
Cat. No.	Pack Size
05 339 880 001	2x500 mg

Will be supplied as "Liberase MTF C/T (2:3) GMP Grade". Unit of Measure is "piece".

DRY ICE

Contents

01. Collagenase I/II MTF Blend (≥2,000 U) GMP Grade, 2x
02. Thermolysin MTF (15mg) GMP Grade, 3x



Unmatched purity: HPLC Analysis of Liberase MTFC/T GMP Grade shows only trace levels of Collagenase I b + I c, common impurities in other products.

Human Islets isolated by using Liberase MTF C/T GMP Grade.

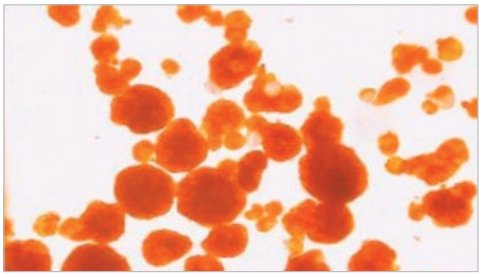
Blended Proteolytic Enzyme for Tissue Dissociation.
For further processing only.

CUSTOMBIOTECH

Liberase Enzyme Blends

Leading Performance in Tissue Dissociation

- Mammalian Tissue Free (MTF)
- GMP Grade and/or sterile according to the European Pharmacopoeia
- Custom sizes and blends available, according to your specifications



Human Islets isolated by using Liberase MTF

Blended proteolytic enzyme for tissue dissociation.

custombiotech.roche.com/liberasegmp

Your Roche Custom Biotech Customer Service

Europe, Middle East, Africa, and Latin America +49 621 759 8580
mannheim.custombiotech@roche.com

Japan +81 3 5443 5285
japan.custombiotech@roche.com

Asia Pacific +65 6371 6638
apac.custombiotech@roche.com

Canada +1 450 686 7050
custombiotech.can@roche.com

United States
+1 800 428 5433, ext. 14649 (toll-free)
custombiotech.ussales@roche.com

Roche Diagnostics GmbH
Sandhofer Straße 116
68305 Mannheim, Germany

Roche

Liberase T-Flex, Research Grade

0.2µm filtered, lyophilizate

The Liberase T-Flex, Research Grade kit enables individual blends of collagenase and thermolysin in low level ratios. The enzymes are manufactured for applications in research where high purity, consistent quality and low levels of bacterial endotoxins are required for reproducible high cell yield and viability.

Application

Use Liberase T-Flex, Research Grade, for *in vitro* enzymatic dissociation of a broad range of tissues, enabling isolation of single cells. In particular intended for use in isolation procedures of pancreatic islets from several animal types.

Benefits

- **Increase safety.** Liberase T-Flex, Research Grade, is manufactured free of mammalian and avian tissue-derived raw materials.
- **Maximize viability and yield of isolated cells** due to reduced clostripain and trypsin activity, as well as reduced endotoxin content.
- **Save time and resources** with high experimental reproducibility due to higher lot-to-lot consistency.
- **Count on higher specific activity of these enzyme blends** as a result of higher Collagenase I + II purity as determined by HPLC analysis.

Product Description

The Liberase T-Flex Research Grade kit contains highly purified collagenase class I and class II from *Clostridium histolyticum*. The two collagenase isoforms are blended in a precise ratio with each other. Highly purified thermolysin from *Bacillus thermoproteolyticus* is provided in a separate vial to allow individual adjustments of enzyme ratios for optimization of your tissue dissociation protocol.

EC 3.4.24.-

Specification

I. Collagenase I/II (500 mg)
Appearance: White lyophilized cake
Protein content: 430-644 mg protein (target: 537 mg protein)
Activity target (Wünsch, calculated): 2,895 U/bottle
Ratio collagenase II/total collagenase: 0.3-0.5

II. Thermolysin (15 mg)
Appearance: White lyophilized cake
Protein content: 12.0-18.0 mg protein (target 15.0 mg protein)
Activity target neutral protease (calculated): 180,000 U/bottle
Stability: At -15 to -25°C within specification range for 12 months.

Cat. No.	Pack Size
05 989 132 001	500 mg

Will be supplied as "Liberase T-Flex Research Grade". Unit of Measure is "piece".

Contents

01.Collagenase I/II Blend (500mg), 1x
02.Thermolysin (15mg), 2x

For life science research only. Not for use in diagnostic procedures.

Neuraminidase (exo-α-Sialidase)
from *Vibrio cholerae*, solution

Neuraminidase is a glycohydrolase.

Application
Neuraminidase hydrolyzes terminal N- or O-acetylneuraminic acids which are α2,3-, α2,6-, α2,8- linked to oligosaccharides, polysaccharides, mucopolysaccharides, glycoproteins, and glycolipids. For the hydrolysis of glycolipids, the presence of a detergent is necessary. Roche's Neuraminidase is very well suited for structural research studies on glycoconjugates ans for hydrolytic cleavage of sialic acid from biological material.

Benefits
- Profit from broad substrate specifity and absence of proteases.

Product Description
Neuraminidase hydrolyzes terminal N- or O-acyl-neuraminic acids that are α2,3-, α2,6-, or α2,8-linked to galactose, Hex, NAc, or N- or O-acylated neuraminyl residues in oligosaccharides/glycoconjugates or colominic acid. Relative rate of cleavage is α2→3 >α2→6 >α2→8, determined on bonds in tri- and tetrasaccharides.

EC 3.2.1.18

Properties
Molecular weight: Approximately 95 kD
pH optimum: 5.5-6.2
Specific activity: Approximately 20 U/mg total protein (approximately 40 U/mg enzyme protein at +37°C) and pH 5.5 with N-acetyl-neuraminosyl-D-lactose as the substrate.

Specification
Appearance: Clear, colorless solution
Contents (after blending with Micr-O-protect® and EDTA): Natrium acetate, 50 mmol/l; NaCl, 154 mmol/l; $CaCl_2$, 9 mmol/l; EDTA, 10 mmol/l; Micr-O-protect® 0.1% (w/v)
pH value: 5.0-6.0
Activity (+37°C, with N-acetylneuraminyl-lactose): ≥1.0 U/ml
Stability: At +2 to +8°C within specification range for 18 months.

Cat. No.	Pack Size
11 087 096 103	custom fill

Will be supplied as "Neuraminidase (Sialidase)". Unit of Measure is "U".
For further processing only.

N-Glycosidase A (PNGase A)
solution

Enzyme that cleaves N-glycans.

Application
Use N-Glycosidase A to cleave all types of asparagine bound N-glycans including high mannose-, hybrid-, biantennary-, triantennary- and tetraantennary complex types, provided that the amino group as well as the carboxyl group are present in peptide linkage. Use N-Glycosidase A also to cleave a single N-acetylglucosamine residue from the peptide.

Benefits
- Obtain a clean reaction by using an enzyme without contaminating glycohydrolase activities.

EC 3.5.1.52

Specification
Appearance: Clear, colorless solution
Activity: ≥50 mU/ml
Specific activity (Bradford): ≥0.5 U/mg protein
Contaminants (expressed as percentage of N-Glycosidase-A activity):
α-Galactosidase: ≤0.1
β-Galactosidase: ≤0.1
β-Glucosidase: ≤0.1
α-Mannosidase: ≤0.1
β-Mannosidase: ≤0.1
β-N-Acetyl-glucosaminidase: ≤0.1
β-Xylosidase: ≤0.1
α-Fucosidase: ≤0.1
Sialidase (after 17 hours at +37°C): ≤0.1
Proteases (casein-resorufin, for 17 hours at +37°C): ΔA/17h ≤0.025
Stability: At -15 to -20°C within specification range for 24 months.

Cat. No.	Pack Size
11 646 583 103	custom fill

Will be supplied as "N-Glycosidases A, Solution". Unit of Measure is "milliU".

DRY ICE

For further processing only.

Catalase
from *Corynebacterium glutamicum*, lyophilizate

Catalase can be used for removal of H_2O_2.

Application
Catalase is used in eye care industry for neutralization of H_2O_2 for cleaning contact lenses.

Benefits
Increase cost efficiency by reducing enzyme input. In comparison to catalase from bovine liver, Roche Catalase from Corynebacterium glutamicum has:
- Higher thermal stability
- Higher pH stability
- More stability in the presence of H_2O_2

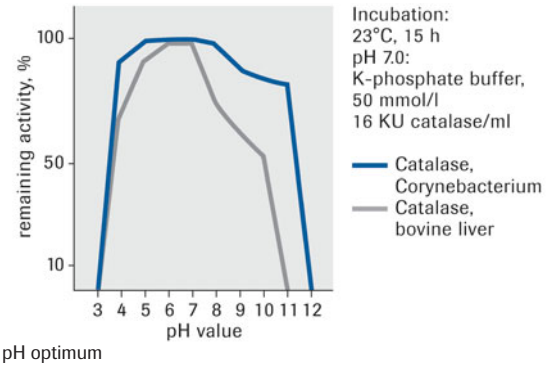
Product Description
Biological activity: 150 IU of Catalse are sufficient to completely remove 3% hydrogen peroxide in 10 minutes.
Source: Microbial from *Corynebacterium glutamicum*

EC 1.11.1.6

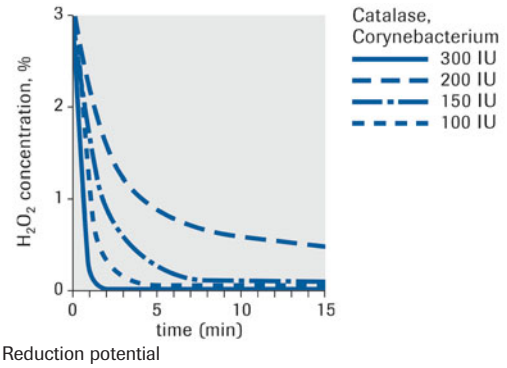
Specification
Appearance: Brown lyophilizate
Solubility: Clear solution in phosphate buffer, 0.05 mol/l, pH 7.5 (c=40 mg/ml)
pH value (c=10 mg/ml in water): 7.0-8.0
Activity (+25°C, H_2O_2): 11,000-17,000 U/mg lyophilizate
Sucrose (TC food, Ident No. 10 139 041): ≥60%
Purity (HPLC, A_{280}): ≥90 area%
Water (K. Fischer): ≤5%
Bioburden:
Total amount: ≤50 CFU/g lyophilizate
Germ differentiation according to DAB 10 (*E. coli*, *Salmonellae*, *Staphylococcus aureus*, *Pseudomonas aeruginosa)*: Below the limit of detection
Stability: At +2 to +8°C within specification range for 18 months.

Cat. No.	Pack Size
11 650 645 103	custom fill

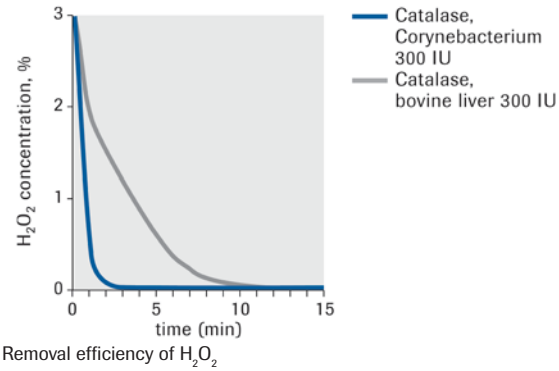
Will be supplied as "Catalase, Microbial Lyophilizate". Unit of Measure is "GU".



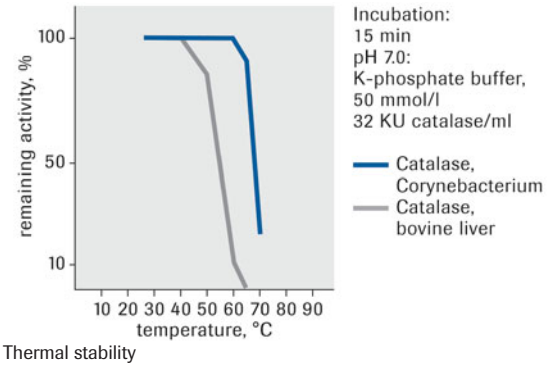
pH optimum



Reduction potential



Removal efficiency of H_2O_2



Thermal stability

For further processing only.

Catalase

from *Corynebacterium glutamicum*, solution

Catalase can be used for removal of H_2O_2.

Application

Catalase is used in eye care industry for neutralization of H_2O_2 for cleaning contact lenses.

Benefits

Increase cost efficiency by reducing enzyme input. In comparison to catalase from bovine liver, Roche Catalase from Corynebacterium glutamicum has:

- Higher thermal stability
- Higher pH stability
- More stability in the presence of H_2O_2

Product Description

Biological activity: 150 IU of Catalase are sufficient to completely remove 3% hydrogen peroxide in 10 minutes.
Source: Microbial from *Corynebacterium glutamicum*

EC 1.11.1.6

Specification

Appearance: Brownish-green, clear solution
pH value: 7.0-8.0
Density (according to DAB 10): No limit
Activity (+25°C, H_2O_2): ≥500,000 U/ml
Glycerol (enzymatically): 310-430 mg/ml (≙ 25-35%, v/v)
Ethanol (enzymatically): 71-87 mg/ml (≙ 9-11%, v/v)
Water: No limit
Purity (HPLC, A_{280}): ≥90 area%
Bioburden:
Total amount: ≤15 CFU/ml
Germ differentiation according to DAB 10 (*E. coli, Salmonellae, Staphylococcus aureus, Pseudomonas aeruginosa)*: Below the limit of detection
Stability: At +2 to +8°C within specification range for 18 months.

Cat. No.	Pack Size
11 668 153 103	custom fill

Will be supplied as "Catalase Microbial in Glycerol". Unit of Measure is "GU".
For further processing only.

Carboxypeptidase B, recombinant
from rat pancreas, expressed in *Pichia pastoris*, solution

Cat. No.	Pack Size
03 358 682 103	30 kU

Will be supplied as "CpB rec.". Unit of Measure is "MU".

DRY ICE

For further processing only.

Carboxypeptidase B, recombinant, is intended to use in highly regulated production processes at pharmaceutical companies.

Application
Use the animal component-free and GMP-manufactured Carboxypeptidase B, recombinant, as critical raw material for the production of active pharmaceutical ingredients (API), *i.e.,* insulin.

Benefits
- **Obtain a cGMP-manufactured product** for use in highly regulated processes.
- **Eliminate the risk of virus contamination** and the risk of animal-related cross-contamination.
- **Rely on high purity.** Minimize the risk of host cell protein contamination in your final product.
- **Increase the safety of your production processes** with robust and reproducible performance and high lot-to-lot consistency.

Product Description
Carboxypeptidase B is a widely used metalloprotease, typically isolated from pancreas of different animals, that specifically releases arginine and lysine from the C-terminus of peptides and proteins. Roche has chemically synthesized a gene encoding for the amino acid sequence of the rat Carboxypeptidase B and has transformed the gene into the expression host *Pichia pastoris*, which expresses the recombinant Carboxypeptidase B as active protease with identical properties compared to the native Carboxypeptidase B. The product is manufactured under current good manufacturing practice (cGMP). No animal-derived products are used in the fermentation, purification and final formulation. The production process is validated resulting in a very high lot-to-lot consistency.

EC 3.4.17.2

Properties
Molecular weight: 34.6 kD

Specification
Appearance: Clear, colorless to slightly yellowish solution
Storage buffer: Tris/HCl, 33 mmol/l; $ZnCl_2$, 0.1 mmol/l; pH 7.5-8.5 at +25°C
Activity (hippurylarginine): ≥400 U/ml
Total activity: 30 kU ±15%
Specific activity: ≥210 U/mg
Protein: 2.8±0.5 mg/ml
Purity (RP-HPLC, according to master lot): ≥85%
Bioburden: ≤50 CFU/ml
Trypsin (Chromozym TRY)**:** ≤0.005%
Stability: At -15 to -25°C within specification range for 24 months.

Quality
Carboxypeptidase B, recombinant, is produced completely animal component-free and according to cGMP guidelines.

Background Information
For several years Roche has successfully pursued the strategy of replacing animal-derived enzymes, frequently used in pharmaceutical production processes with recombinant, animal component-free enzymes.
Related products are recombinant Trypsin, recombinant Proteinase K, recombinant DNase I and others.

Endoproteinase Asp-N, Sequencing Grade
from a mutant of *Pseudomonas fragi*, lyophilizate

Endoproteinase Asp-N can be used for specific cleavage of peptides.

Application
Use Endoproteinase Asp-N, Sequencing Grade, for protein structure analysis and sequence analysis.

Benefits
- **Obtain consistent and clear peptide sequencing results.** Minimize the risk of unknown peptide impurities by using this highly purified quality.

Product Description
Endoproteinase Asp-N is a widely used metalloprotease, that specifically hydrolyzes peptide bonds at the amino side of aspargine and cysteine. If cysteine is reduced or alkylated only -↓-Asp-X is cleaved. Endoproteinase Asp-N is isolated from *Pseudomonas fragi* mutant. The protease is supplied as lyophilizate.

EC 3.4.24.33

Properties
Molecular weight: 27 kD
pH optimum: 7.0–8.0
Inhibitors: EDTA and α-phenanthroline

Specification
Appearance: White lyophilizate
Activity (+37°C, azocoll): ≥40 U/bottle
Specific activity: ≥20,000 U/mg protein
Purity (SDS PAGE, homogeneity; PhastSystem®, 8-25% reducing terms): ≥90%
Specificity (HPLC, glucagon, after 1 hour incubation): ≥90%
Unspecific cleavage peptides (HPLC, melittin, after 4 hours incubation): ≤10%
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Quality
Endoproteinase Asp-N, Sequencing Grade, is free of impurities, according to the current Quality Control procedures, that may interfere with separation of peptides in RP HPLC.

Background Information
Roche offers a broad portfolio of highly purified endoproteinases suitable for peptide sequencing or other specific application. Related products are Endoproteinase Lys-C, Sequencing Grade, Endoproteinase Glu-C, Sequencing Grade, Endoproteinase Arg-C, Sequencing Grade, and others.

Cat. No.	Pack Size
11 058 541 103	2 µg

Will be supplied as "Endoproteinase Asp-N Sequencing Grade".
Unit of Measure is "piece".
For further processing only.

Endoproteinase Glu-C
from *Staphylococcus aureus* V8, lyophilizate, salt-free

Endoproteinas Glu-C can be used for specific cleavage of peptides.

Application
Use Endoproteinase Glu-C for protein structure analysis and sequence analysis.

Product Description
Endoproteinase Glu-C is a widely used serine protease, that specifically hydrolyzes peptide bonds at the carboxylic side of glutamic acid (in ammonium bicarbonate, pH 7.8, or ammonium acetate buffer, pH 4.0), or glutamic acid and aspartic acid (in phosphate buffer, pH 7.8). Endoproteinase Glu-C is isolated from *Staphylococcus aureus* and is supplied as a salt-free lyophilizate.

EC 3.4.21.19

Properties
Molecular weight: 30 kD
pH optimum: 4.0-7.8
Inhibitors: DFP, α_2-macroglobulin, and TLCK

Specification
Appearance: White lyophilizate
Activity: ≥20 U/mg lyophilizate
Stability: At +2 to +8°C within specification range for 24 months.

Background Information
Roche offers a broad portfolio of highly purified endoproteinases suitable for hydrolyzing of peptides or proteins. Related products are Endoproteinase Lys-C, Endoproteinase Asp-N, Endoproteinase Arg-C, and others.

Cat. No.	Pack Size
10 787 906 103	50 µg

Will be supplied as "Endoproteinase Glu-C (Staph.aureus V 8)".
Unit of Measure is "mg".
For further processing only.

Endoproteinase Glu-C, Sequencing Grade
from *Staphylococcus aureus* V8, lyophilizate

Endoproteinase Glu-C, Sequencing Grade, can be used for specific cleavage of peptides.

Application
Use Endoproteinase Glu-C, Sequencing Grade, for protein structure analysis and sequence analysis.

Benefits
- **Obtain consistent and clear peptide sequencing results.** Minimize the risk of unknown peptide impurities by using this highly purified quality.

Product Description
Endoproteinase Glu-C is a widely used serine protease, that specifically hydrolyzes peptide bonds at the carboxylic side of glutamic acid (in ammonium bicarbonate, pH 7.8, or ammonium acetate buffer, pH 4.0), or glutamic acid and aspartic acid (in phosphate buffer, pH 7.8). Endoproteinase Glu-C is isolated from *Staphylococcus aureus* and is supplied as a salt-free lyophilizate.

EC 3.4.21.19

Properties
Molecular weight: 30 kD
pH optimum: 4.0–7.8
Inhibitors: DFP, α_2-macroglobulin, and TLCK

Specification
Appearance: White lyophilizate
Specific activity: ≥15 U/mg protein
Protein (BCA): ≥50 µg/bottle
Contaminants (HPLC): ≤10%
Specificity (HPLC, insulin B_{ox}, after 1 hour incubation): ≥90%
Unspecific cleavage peptides (after 18 hours incubation): ≤5%
Stability: At +2 to +8°C within specification range for 24 months. Store dry.

Quality
Endoproteinase Glu-C is free of impurities, according to the current Quality Control procedures, that may interfere with separation of peptides in RP HPLC.

Background Information
Roche offers a broad portfolio of highly purified endoproteinases suitable for peptide sequencing or other specific application. Related products are Endoproteinase Lys-C, Sequencing Grade, Endoproteinase Asp-N, Sequencing Grade, Endoproteinase Arg-C, Sequencing Grade, and others.

Cat. No.	Pack Size
11 058 525 001	50 µg

Will be supplied as "Endoproteinase Glu-C Sequencing Grade".
Unit of Measure is "piece".
For further processing only.

Endoproteinase Lys-C
from *Lysobacter enzymogenes*, lyophilizate

Endoproteinase Lys-C can be used for specific cleavage of peptides.

Application
Use Endoproteinase Lys-C for protein structure analysis and for sequence analysis. It is suitable to digest proteins in solution, in polyacrylamide gels or on blotting membranes.

Product Description
Endoproteinase Lys-C is a widely used serine protease, that specifically hydrolyzes amide, ester, and peptide bonds at the carboxylic side of lysin. Endoproteinase Lys-C is isolated from *Lysobacter enzymogenes* and is supplied as a lyophilizate.

EC 3.4.21.50

Properties
Molecular weight: 33 kD (reduced), 30 kD (nonreduced)
pH optimum: 8.5-8.8
Inhibitors: DFP, TLCK, aprotinin, and leupeptin

Specification
Appearance: White lyophilizate
Activity: ≥3 U/bottle
Specific activity: ≥150 U/mg protein
Unspecific cleavage peptides (HPLC, after 6 hours incubation): ≤5 area%
Stability: At +2 to +8°C within specification range for 12 months.

Background Information
Roche offers a broad portfolio of endoproteinases suitable for hydrolyzing of peptides or proteins. Related products are Endoproteinase Glu-C, Endoproteinase Asp-N, Endoproteinase Arg-C and others.

Cat. No.	Pack Size
10 476 978 103	3 U

Will be supplied as "Endoproteinase Lys-C, Lysobacter enzymog.".
Unit of Measure is "U".
For further processing only.

Endoproteinase Lys-C, Sequencing Grade
from *Lysobacter enzymogenes*, lyophilizate

Endoproteinase Lys-C, Sequencing Grade, can be used for specific cleavage of peptides.

Application
Use Endoproteinase Lys-C, Sequencing Grade, for protein structure analysis and for sequence analysis. It is suitable to digest proteins in solution, in polyacrylamide gels or on blotting membranes.

Benefits
- **Obtain consistent and clear peptide sequencing results.** Minimize the risk of unknown peptide impurities by using this highly purified quality.

Product Description
Endoproteinase Lys-C, Sequencing Grade, is a widely used serine protease, that specifically hydrolyzes amide, ester, and peptide bonds at the carboxylic side of lysin. Endoproteinase Lys-C is isolated from *Lysobacter enzymogenes* and is supplied as a lyophilizate.

EC 3.4.21.50

Properties
Molecular weight: 33 kD (reduced), 30 kD (nonreduced)
pH optimum: 8.5-8.8
Inhibitors: DFP, TLCK, aprotinin, and leupeptin

Specification
Appearance: White lyophilizate
Activity: ≥3 U/bottle
Specific activity: ≥150 U/mg protein
Unspecific cleavage peptides (HPLC, after 6 hours incubation; based on area sum): ≤5 area%
Stability: At +2 to +8°C within specification range for 12 months.

Quality
Endoproteinase Lys-C, Sequencing Grade, is free of impurities, according to the current Quality Control procedures, that may interfere with separation of peptides in RP HPLC. Purity is checked by HPLC and SDS PAGE using silver staining.

Background Information
Roche offers a broad portfolio of highly purified endoproteinases suitable for peptide sequencing or other specific application. Related products are Endoproteinase Glu-C, Sequencing Grade, Endoproteinase Asp-N, Sequencing Grade, Endoproteinase Arg-C, Sequencing Grade, and others.

Cat. No.	Pack Size
11 058 533 103	5 µg

Will be supplied as "Endoprot. Lys-C, Sequ., MPB 5 UG". Unit of Measure is "piece".
For further processing only.

Endoproteinase Lys-C, Sequencing Grade
from *Lysobacter enzymogenes*, solution

Endoproteinase Lys-C, Sequencing Grade, can be used for specific cleavage of peptides.

Application
Use Endoproteinase Lys-C, Sequencing Grade, for protein structure analysis and for sequence analysis. It is suitable to digest proteins in solution, in polyacrylamide gels or on blotting membranes.

Benefits
- **Obtain consistent and clear peptide sequencing results.** Minimize the risk of unknown peptide impurities by using this highly purified quality.

Product Description
Endoproteinase Lys-C is a widely used serine protease, that specifically hydrolyzes amide, ester, and peptide bonds at the carboxylic side of lysin. Endoproteinase Lys-C is isolated from *Lysobacter enzymogenes* and is supplied as a solution.

EC 3.4.21.50

Properties
Molecular weight: 33 kD (reduced), 30 kD (nonreduced)
pH optimum: 8.5-8.8
Inhibitors: DFP, TLCK, aprotinin, and leupeptin

Specification
Appearance: Clear, colorless solution
Activity (+25°C, Chromozym PL): No limit (U/ml)
Specific activity: ≥200 U/mg protein
Protein (A_{280}): ≥0.1 mg/ml
Purity (SDS PAGE): ≥90%
Specifity (HPLC, melittin, after 1 hour incubation): ≥90%
Unspecific cleavage peptides (HPLC, Insulin Box, after 18 hours incubation): ≤5 area%
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Endoproteinase Lys-C, Sequencing Grade, is free of impurities, according to the current Quality Control procedures, that may interfere with separation of peptides in RP HPLC. Purity is checked by HPLC and SDS PAGE using silver staining.

Background Information
Roche offers a broad portfolio of highly purified endoproteinases suitable for peptide sequencing or other specific application. Related products are Endoproteinase Glu-C, Sequencing Grade, Endoproteinase Asp-N, Sequencing Grade, Endoproteinase Arg-C, Sequencing Grade, and others.

Cat. No.	Pack Size
11 051 199 103	custom fill

Will be supplied as "Endoproteinase Lys-C Sequencing Grade". Unit of Measure is "mg".

DRY ICE

For further processing only.

Papain
from *Carica papaya*, suspension

Papain can be used for complete proteolytic cleavage of peptides and proteins.

Application
Use Papain for:
- Complete proteolytic cleavage of peptides and proteins
- Limited hydrolysis of native immunoglobulins
- Tissue dissociation (together with collagenase, esterase, trypsin)
- Solubilization of integral membrane proteins
- Production of glycopeptides from purified proteoglycans

Benefits
- **Increase the safety of your processes** with reproducible performance and high lot-to-lot consistency.

Product Description
Papain is a cysteine endopeptidase, hydrolyzing proteins, peptides, amides, and esters of amino acids and peptides, especially at bonds involving Arg, Lys, Glu, His, Gly and Tyr. Upon prolonged incubation, further bonds are cleaved; shows also esterase and transamidase activity, and is used for peptide synthesis.
Papain is isolated from *Carica papaya* and is supplied as a lyophilizate.

EC 3.4.22.2

Properties
Molecular weight: 23 kD ±2

Specification
Appearance: White suspension
pH value (c=10 mg/ml): 4.0-5.0
Specific activity (+25°C, BAEE): ≥30 U/mg protein
Protein (ΔA_{280}, 1%=24): ≥10 mg/ml
Stability: At + 2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
10 154 644 103	custom fill

Will be supplied as "Papain from Carica papaya". Unit of Measure is "g".
For further processing only.

Papain
from *Carica papaya*, 0.2µm filtered, solution

Cat. No.	Pack Size
11 720 422 103	custom fill

Will be supplied as "Papain filtered". Unit of Measure is "g".
For further processing only.

Papain can be used for complete proteolytic cleavage of peptides and proteins.

Application
Use Papain for:
- Complete proteolytic cleavage of peptides and proteins
- Limited hydrolysis of native immunoglobulins
- Tissue dissociation (together with collagenase, esterase, trypsin)
- Solubilization of integral membrane proteins
- Production of glycopeptides from purified proteoglycans

Benefits
- **Increase the safety of your processes** with reproducible performance and high lot-to-lot consistency.
- **Minimize the risk of microbial cross-contamination** in your product by very low bioburden.

Product Description
Papain is a cysteine endopeptidase, hydrolyzing proteins, peptides, amides, and esters of amino acids and peptides, especially at bonds involving Arg, Lys, Glu, His, Gly and Tyr. Upon prolonged incubation, further bonds are cleaved. Papain shows also esterase and transamidase activity, and is used for peptide synthesis.
Papain is isolated from *Carica papaya* and is supplied as a lyophilizate.

EC 3.4.22.2

Properties
Molecular weight: 23 kD ±2

Specification
Appearance: White suspension
pH value: 4.3-4.8
Solubility: Clear, colorless solution in water (c=12 mg/ml)
Specific activity (+25°C, BAEE): ≥16.0 U/mg protein
Protein (ΔA_{280}, 1%=24, standardized, measured against sodium acetat, 50 mmol/l): 12±1 mg/ml
Purity (SDS PAGE): ≥80%
Band profile based on reference lot: Corresponds to specification
Bioburden (according to DAB 10): ≤100 CFU/ml
Endotoxins: ≤100 EU/ml
Stability: At +2 to +8°C within specification range for 6 months.

Quality
0.2 µm filtered describes the state-of-the art process to reduce the risk of contamination by passing solutions through a filter with 0.22 µm or less in pore size. This reagent is not specified as being sterile according to pharmacopoeia monographs.

Pronase
from *Streptomyces griseus*, lyophilizate

Pronase is used for total degradation of proteins.

Application
Use Pronase for:
- Total degradation of proteins during isolation of DNA and RNA
- Total hydrolysis of proteins for technical purposes
- Tissue dissociation in conjunction with collagenases and trypsin
- Production of glycopeptides from purified glycoproteins

Benefits
- Rely on a high proteolytic activity and a low nuclease contamination activity.
- Increase the safety of your application processes with reproducible performance and high lot-to-lot consistency.

Product Description
Pronase is a mixture of several nonspecific endo- and exoproteases that digest proteins down to single amino acids. Resolves carboxylic acids and alcohols.

EC 3.4.24.4

Properties
pH optimum: 6.0–7.5

Specification
Appearance: Near white lyophilizate
Activity (+40°C, casein): ≥6,000 U/g lyophilizate
Contaminants:
DNases/RNases: ≤0.002 U/mg lyphilizate
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Quality
Contaminants are ≤0.002 U DNase/RNase per mg lyophilizate.

Background Information
The preparation contains approximately 20% calcium acetate.

Cat. No.	Pack Size
10 165 913 103	custom fill

Will be supplied as "Pronase from Streptomyces griseus". Unit of Measure is "g".
For further processing only.

Trypsin, recombinant
from porcine pancreas, expressed in *Pichia pastoris*

Trypsin, recombinant, is intended to use in highly regulated production processes at pharmaceutical companies.

Application
Use the animal component-free and GMP-manufactured Trypsin, recombinant, as critical raw material for the production of active pharmaceutical ingredients (API), *i.e.,* insulin, vaccines and for cell dissociation.

Benefits
- **Obtain a cGMP-manufactured product** for use in highly regulated processes.
- **Eliminate the risk of virus contamination** and the risk of animal-related cross-contamination.
- **Rely on high purity.** Minimize the risk of host cell protein contamination in your final product.
- **Increase the safety of your production processes** with reproducible performance and high lot-to-lot consistency.

Product Description
Trypsin is a widely used serine protease, typically isolated from pancreas of different animals, that specifically cleaves at the C-terminus of arginine and lysine within a peptide chain. Roche has chemically synthesized a gene encoding for the amino acid sequence of the porcine Trypsin and has transformed the gene into the expression host *Pichia pastoris*, which expresses the recombinant Trypsin as active protease with identical properties compared to the native Trypsin.
The product is manufactured under current good manufacturing practice (cGMP). No animal-derived products are used in the fermentation, purification and final formulation. The production process is validated resulting in a very high lot-to-lot consistency.

EC 3.4.4.4

Properties
Molecular weight: 23.5 kD
pH optimum: 8.0
Inhibitors: TLCK, DFP, PMSF, leupeptin, soybean trypsin inhibitor, trypsin inhibitor from hen egg, aprotinin, α_2-macroglobulin, α_1-antitrypsin, APMSF, and antipain

Specification
Appearance: Clear, colorless to slightly yellowish solution
Storage buffer: HCl, 10 mmol/l; $CaCl_2$, 20 mmol/l
pH value: 2±0.5
Activity (Chromozym TRY): ≥10,800 U/ml
Total activity (Chromozym TRY): 3.5 MU ±10%
Specific activity: ≥180 U/mg
Protein: 70±10 mg/ml
Purity (RP-HPLC, according to master lot): ≤20% α-trypsin, ≥70% β-trypsin
Bioburden: ≤100 CFU/ml
Stability: At -15 to -25°C within specification range for 24 months.

Quality
Trypsin, recombinant, is produced completely animal component-free and according to cGMP guidelines.

Background Information
For several years Roche has successfully pursued the strategy of replacing animal-derived enzymes, frequently used in pharmaceutical production processes with recombinant, animal component-free enzymes.
Related products are recombinant Carboxypeptidase B, recombinant DNase I, and others.

Cat. No.	Pack Size
03 358 658 103	3.5 MU
06 369 880 103	1 g

Will be supplied as "Trypsin rec. Bulk". Unit of Measure is "MU".

DRY ICE

For further processing only.

MycoTOOL PCR Mycoplasma Detection Kit

Highly sensitive PCR test for the detection of Mycoplasmas, accepted for validation according to the E.P. 2.6.7 directive.
This test is suitable for release testing and in-process control. It can replace culture and indicator cell tests.

Application

Use the MycoTOOL test in the field of biopharmaceutical and vaccine production, cell therapy, transplantation, and veterinary testing.
Description of the workflow: 1 ml of sample is divided and purified in 2 x 200 µl eluate. From each eluate two Mycoplasma PCR reactions and two GAPDH PCR reactions are performed (20 µl reaction volume). A GAPDH PCR is perfomed using undiluted eluate to control for inhibition effects of the matrix. This control eliminates the risk of undetected intracellular Mycoplasma. A PCR with a 1:100 dilution of the eluate controls test sensitivity. The desired dilution can be adapted to the tested matrix. Analysis of the amplicons is performed using polyacrylamide gel electrophoresis. No poststaining is required since the detection dye is included in the PCR mix.

Benefits

- **Save time.** Replace traditional 28 days culture testing with the rapid MycoTOOL PCR Test.
- **Speed up your validation.** Rely on published Roche validation data (see Literature).
- **Detect traces of Mycoplasmas.** The sensitivity is 1 CFU/ml.
- **Minimize the risk of false negatives and false positives.** The matrix lysis control eliminates risk of undetected intracellular Mycoplasma. The diluted GAPDH and positive control identify potential PCR inhibition. False positives are prevented by nucleic acid free reagents, tested according to Roche's current ultrasensitive Quality Control procedures. Uracil-DNA Glycosylase pretreatment is performed to prevent contamination by PCR carryover.
- **Detect the broad panel of Mollicute species.** A universal primer design covers a whole range of Mycoplasmas.
- **Achieve process security.** Rely on test results using a consistent kit quality and established change control procedures.

Product Description

The MycoTOOL Mycoplasma Detection Prep Kit contains all necessary reagents for purifying the DNA, while the MycoTOOL Mycoplasma Detection Amplification Kit supplies all reagents for the amplifications step.

Specification

MycoTOOL, Mycoplasma Detection Amp Kit, Cat. No. 05 184 240
Bottle 1a: Clear, viscous solution
Bottle 1b, 2, 3, 4, 6, 7, 8, 9, 10: Clear, colorless solution
Bottle 5: Clear, slightly yellow solution
Bottle 8 (negative control): No amplicon is detectable using Roche reference material.
Bottle 9 (positive control of the PCR): 2 of 4 replicates are recognized at 360 bp using Roche reference material.
Stability: At -15 to -25°C within specification range for 12 months. Once the kit is opened, store all kit components at +15 to +25°C. In addition, store vial 5, the detection dye, protected from light.

MycoTOOL, Mycoplasma Detection Prep Kit, Cat. No. 05 184 592
Bottle 1, 2, 3, 4, 5, 6: Colorless solution
Packaging: 45 tubes with colorless cap in printed Zip-Lock bag
Stability: At -15 to -25°C within specification range for 12 months. Once the kit is opened, store all kit components at room temperature. Do not freeze or store the kit in a refrigerator.

Cat. No.	Pack Size
05 200 709 001	1 Kit for testing of 10 samples (1 ml each)

The MycoTOOL PCR Mycoplasma Detection Kit is shipped in 2 separate subkits, according to the components' shipping temperature requirements.
Subkit 1: MycoTOOL Mycoplasma Detection Prep Kit, Cat. No. 05 184 592 001; shipping at room temperature.
Subkit 2: MycoTOOL Mycoplasma Detection Amplification Kit, Cat. No. 05 184 240 001; shipping on dry ice. Unit of Measure is "piece".

DRY ICE

Contents

Subkit 1: MycoTOOL Mycoplasma Detection Prep Kit, Cat. No. 05 184 592 001
01. Proteinase K
02. Lysis Buffer
03. Precipitation Reagent
04. Washing Buffer
05. Dissolution Buffer
06. Reaction vials
Subkit 2: MycoTOOL Mycoplasma Detection Amplification Kit, Cat. No. 05 184 240 001
01a. RM1a Master Mix
01b. RM1b Master Mix
02. $MgCl_2$-Solution
03. Primer Mix, Mycoplasma
04. Primer Mix, GAPDH
05. Detection Dye
06. Water, PCR Grade
07. Dilution Buffer
08. Negative Control
09. Positive Control
10. DNA Molecular Weight Marker

For use in quality control/manufacturing processes only.

Quality

False positives are prevented by nucleic acid free reagents, tested according to Roche's current ultrasensitive Quality Control procedures. Uracil-DNA Glycosylase pretreatment prevents contamination by PCR carryover. Change control procedures are used for all reagents and kits.

Background Information

Mycoplasmas are frequent causes of contamination in biopharmaceutical production, cell therapy and tissue engineering. Traditional detection methods, required by Pharmacopoeias and drug regulating agencies worldwide, use growth on culture media to detect contaminating organisms. These culture-based methods are time-consuming, requiring as much as 28 days to complete, laborious and difficult to interpret. Rapid methods, like the new MycoTOOL Test described here, for detecting Mycoplasma contamination, can help improve efficiency, quality and safety in the manufacturing of pharmaceutical and biological products.

Literature

Sven M. Deutschmann, Holger Kavermann, Yvonne Knack, Validation of a NAT-based Mycoplasma assay according European Pharmacopoiea, Biologicals, Volume ***38***, Issue 2, Special Section: Mycoplasma (pp. 181-248), March 2010, Pages 238-248, ISSN 1045-1056

CMP-N-Acetylneuraminic Acid
sodium salt

CMP-N-Acetylneuraminic Acid is an activated sugar.

Application
Use CMP-N-Acetylneuraminic Acid for glycosylation of target substances with the suitable glycotransferase.

CAS: 3063-71-6

Properties
Molecular weight: 659.39 D
Use the activated sugar to transfer sialic acid on an existing sugar chain together with the appropriate sialyltransferase.

Specification
Appearance: White, lyophilizate
Solubility: Clear, colorless solution in water
CMP-NANA (A_{260}): ≥87% (ε=7,4 l x $mmol^{-1}$ x cm^{-1})
CMP-NANA (HPLC): ≥90 area%
CMP-NANA + CMP (HPLC): ≥95 area%
Na (flame photometric): 6-8%
Heavy metals (as Pb): ≤25 ppm (in validation)
CMP (HPLC): ≤10 area%
CDP (HPLC): ≤1 area%
CTP (HPLC): ≤0.5 area%
Sum of unknown impurities (HPLC): ≤1%
Bioburden: ≤100 CFU/g
Stability: At -15 to -25°C within specification range for 12 months.

Quality
CMP-N-Acetylneuraminic Acid is a highly purified product suitable for pharmaceutical applications. It can be produced according to cGMP regulations or as a completely animal component-free product on request. Due to the special designed synthesis pathway, Roche can produce kilogram amounts of CMP-N-Acetylneuraminic Acid in a cost-effective manner.

Background Information
Several years ago, Roche developed a new cost-effective synthesis pathway for the production of activated sugars in large scale. For the production of all activated sugars a valid TSE/BSE certificate is available. Production can be completely animal component-free and according to cGMP regulations on request.
Related products are UDP-Gal (04589173103), UDP-Glc (10154938103), and UDP-GlcNAc (11787900103).

Cat. No.	Pack Size
05 974 003 103	custom fill

Will be supplied as "CMP-NANA, Sodium salt". Unit of Measure is "kg".

DRY ICE

For further processing only.

UDP-N-Acetylglucosamine
disodium salt

Cat. No.	Pack Size
11 787 900 103	custom fill

Will be supplied as "UDP-Glc-Nac". Unit of Measure is "kg".
For further processing only.

UDP-N-Acetylglucosamin is an activated sugar.

Application
Use UDP-GlcNAc for glycosylation of target molecules with a suitable enzyme.

CAS: 7277-98-7

Properties
Formula: $C_{17}H_{25}N_3O_{17}P_2Na_2$
Molecular weight:
UDPGlcNAc: 607.4 D
UDPGlcNAc-Na_2: 651.4

Specification
Appearance: White to slightly yellowish, amorphous powder
Solubility: Clear, colorless to slightly yellowish solution in water (c=100 mg/ml)
pH value (c=100 mg/ml, in water): 5.0-7.0
UDPGlcNAc-Na_2 (A_{260}, ε=9.9 l x $mmol^{-1}$ x cm^{-1}): ≥80.0%
UDPGlcNAc (HPLC): ≥96.0 area%
Na (flame photometric): 6.0-8.0%
Water (K. Fischer): ≤6.0%
P_i: ≤0.4%
Heavy metals (as Pb): ≤10 ppm
Fe (AAS): ≤10 ppm
UDP (HPLC): ≤1.0 area%
UMP (HPLC): ≤1.0 area%
UDP-galactose (HPLC): ≤0.5 area%
UDPG (HPLC): ≤1.5 area%
Uridine (HPLC): ≤0.5 area%
AMP (HPLC): ≤1.0 area%
ATP (HPLC): ≤0.2 area%
UTP (HPLC): ≤0.2 area%
Sum of unknown impurities (HPLC): ≤1.0 area%
Ethanol (GC): ≤10.0%
Isopropanol (GC): ≤20 ppm
Aceton (GC): ≤20 ppm
Methanol (GC): ≤20 ppm
Bioburden: ≤100 CFU/g
Mould: ≤50 CFU/g
Yeast: ≤50 CFU/g
Stability: At +2 to +8°C within specification range for 30 months.

UDP-Galactose
disodium salt, powder

UDP-Galactose is an activated sugar.

Application
Use UDP-Galactose for glycosylation of target substances using suitable transferase enzyme.

CAS: 137868-52-1

Properties
Formula: $C_{15}H_{22}N_2O_{17}P_2Na_2$
Molecular weight:
UDP-galactose: 566.3 D
UDP-galactose-Na_2: 610.3 D

Specification
Appearance: White powder
Solubility: Clear, colorless solution in water (c=100 mg/ml)
pH value (solution, c=100 mg/ml): 5.0-7.0
UDP-galactose, disodium salt (A_{260}, ε=9.9 l x $mmol^{-1}$ x cm^{-1}): ≥80.0%
UDP-galactose (HPLC): ≥95.0 area%
Na (flame photometric): 6.0-8.0%
Water (K. Fischer): ≤6.0%
UDP (HPLC): ≤1.5 area%
UMP (HPLC): ≤0.5 area%
UDP-GlcNAc (HPLC): ≤0.5 area%
UDPG (HPLC): ≤3.0 area%
Uridine (HPLC): ≤0.5 area%
AMP (HPLC): ≤0.5 area%
ATP (HPLC): ≤0.2 area%
UTP (HPLC): ≤0.2 area%
Total unknown impurities (HPLC): ≤0.5 area%
Heavy metals (as Pb): ≤10 ppm
P_i: ≤0.4%
Fe (AAS): ≤10 ppm
Ethanol (GC): ≤5.5%
2-Propanol (GC): ≤100 ppm
Methanol (GC): ≤50 ppm
Acetone (GC): ≤100 ppm
Bioburden:
Total amount: ≤100 CFU/g
Mould: ≤50 CFU/g
Yeasts: ≤50 CFU/g
Stability: At +2 to +8°C within specification range for 12 months.

Cat. No.	Pack Size
04 589 173 103	custom fill

Will be supplied as "UDP-Galactose, Di-Na". Unit of Measure is "kg".
For further processing only.

UDP-Glucose
disodium salt, powder

Cat. No.	Pack Size
10 154 938 103	custom fill

Will be supplied as "UDP-glucose, Di-Na". Unit of Measure is "kg". For further processing only.

UDP-Glucose is an activated sugar.

Application
Use UDP-Glucose for glycosylation of target molecules with suitable enzyme.

CAS: 28053-08-9

Properties
Formula: $C_{15}H_{22}N_2O_{17}P_2Na_2$
Molecular weight:
UDP-glucose: 566.3 D
UDP-glucose-Na_2: 610.3 D

Specification
Appearance: White to yellowish powder
Solubility: Clear, colorless solution in water (c=50 mg/ml)
pH value (solution, c=50 mg/ml): 5.8-7.2
Identity (NIR spectrum): Corresponds to reference
UDP-Glucose (enzymatically): ≥83.5%
UDP-Glucose (A_{260}, ε=9.9 l x $mmol^{-1}$ x cm^{-1}): ≥83.5%
UDP-Glucose, disodium salt (HPLC, based on dry weight): ≥95.0 area%
Na (flame photometric): 7.0-8.0%
Water (K. Fischer): ≤6.0%
UDP (HPLC): ≤0.5 area%
UMP (HPLC): ≤0.5 area%
UTP (HPLC): ≤0.2%
UDP-Galactose (HPLC): ≤1.5 area%
Uridine (HPLC): ≤0.2 area%
Singleunknown impurity (HPLC): ≤0.5 area%
Total unknown impurities (HPLC): ≤3.0 area%
Sum impurities (HPLC): ≤4.5 area%
Heavy metals (as Pb): ≤10 ppm
P_i: ≤0.3 %
Fe (bathophenanthroline): ≤25 ppm
Ethanol (GC): ≤1,000 ppm
2-Propanol (GC): ≤100 ppm
Methanol (GC): ≤50 ppm
Acetone (GC): ≤100 ppm
A_{250}/A_{260}: 0.71-0.75
A_{250}/A_{280}: 0.38-0.42
A_{290}/A_{260}: 0.03-0.05
Stability: At +2 to +8°C within specification range for 36 months.

β-NAD
free acid, crystalline powder

β-NAD is a cofactor for redox enzymes.

Application
NAD is involved in redox reactions, carrying electrons from one reaction to another and can also act as a cofactor for enzymatic reactions such as dehydrogenases.

Benefits
- Use this animal component- and gluten-free product in the food and pharmaceutical industry.
- Rely on large lot sizes and high lot-to-lot consistency for use in technical applications.

CAS: 53-84-9

Properties
Nomenclature: Nicotinamide adenine dinucleotide
Formula: $C_{21}H_{27}N_7O_{14}P_2$ x 3 H_2O
Molecular weight:
NAD: 663.4 D
NAD x 3 H_2O: 717.4 D

Specification
Appearance: White, crystalline powder
β-NAD x 3 H_2O (calculated from value, enzymatically): ≥99%
β-NAD (enzymatically, A_{340}, ε=6.3 l x $mmol^{-1}$ x cm^{-1}): ≥92%
NAD (CN complex): ≥92%
NAD (A_{260}, ε=17.6 l x $mmol^{-1}$ x cm^{-1}): ≥92%
NAD (HPLC): ≥98 area%
Water (K. Fischer): 4-8%
AMP (enzymatically): ≤0.1%
Acetone (GC): ≤0.05%
Ethanol (GC): ≤0.05%
Isopropanol (GC): ≤0.05%
Methanol (GC): ≤0.05%
A_{250}/A_{260}: 0.81-0.85
A_{280}/A_{260}: 0.20-0.24
Stability: At +2 to +8°C within specification range for 24 months.

Cat. No.	Pack Size
10 768 197 103	custom fill

Will be supplied as "beta-NAD, free acid". Unit of Measure is "kg". For further processing only.

NADH, Food Grade
disodium salt, lyophilizate

NADH, Food Grade, is a cofactor for redox enzymes.

Application
Use NADH, Food Grade, as a cofactor for redox enzymes for industrial biotechnology and also for the determination of pyruvate, LDH, NH_3, GIDH, MDH, and aldehyde.

Benefits
- Use this animal component-free product in the food and pharmaceutical industry.
- Rely on large lot sizes and high lot-to-lot consistency for use in technical applications.

CAS: 606-68-8

Properties
Nomenclature: β-Nicotinamide-adenine-dinucleotide, reduced
Formula:
β-NADH-Na_2: $C_{21}H_{27}N_7O_{14}P_2Na_2$
β-NADH: $C_{21}H_{27}N_7O_{14}P_2$
Molecular weight:
β-NADH-Na_2: 709.4 D
β-NADH: 665.4 D

Specification
Appearance: White to slightly yellowish lyophilizate
Solubility: Clear, colorless to slightly yellowish solution in water (c=50 mg/ml)
pH value (c=100 mg/ml): 8-9
NADH-Na_2 (enzymatically, based on dry weight): ≥98%
NADH (enzymatically): ≥85%
NADH (A_{260}, ε=14.3 l x $mmol^{-1}$ x cm^{-1}): ≥85%
NADH (HPLC): ≥95 area%
Na (flame photometric): 6-7%
Water (K.Fischer): ≤6%
Ethanol (GC): ≤0.2%
NAD (enzymatically): ≤2%
AMP (enzymatically): ≤0.2%
Heavy metals (as Pb): ≤10 ppm
Bioburden:
Total amount: ≤10^4 CFU/g
Coliforme: ≤10^2 CFU/g
Yeasts and moulds: ≤3x10^2 CFU/g
Germ differentiation (*Staphylococcus aureus, Salmonellae, E. coli*:): Negative
Stability: At -15 to -25°C within specification range for 24 months.

Cat. No.	Pack Size
03 277 372 103	custom fill

Will be supplied as "NADH, Di-Na, Food grade, Lyo.". Unit of Measure is "kg".

DRY ICE

For further processing only.

BM Condimed H1

0.2µm filtered, solution

BM Condimed H1 is a culture medium supplement for proliferation of hybridoma cells.

Application

Use BM Condimed H1 as a supplement to the normal culture medium to support the growth of B-cell hybridomas after fusion and during cloning. BM Condimed H1 replaces feeder cells. It is also used to optimize the growth of hybridomas after the thawing of cells stored in liquid nitrogen.
Working concentration: 10% (v/v) in culture medium that contains 10-20% FBS.

Benefits

- **Obtain increased proliferation rate** of your freshly fused hybridoma cells.
- **Obtain increased size and numbers** of colonies.
- **Rely on the unique composition** that makes feeder cells in your application unnecessary.

Product Description

BM Condimed H1 is prepared from the supernatant of a mouse lymphoma cell line stimulated with phorbol myristate acetate (PMA). It contains a complex mixture of growth factors and cytokines that have a marked stimulatory effect on the growth of hybridoma cells after fusion and during cloning.

Specification

Appearance: Clear, reddish solution
Contents: BM Condimed H1 is supplied as 0.2 µm filtered solution in RPMI 1640. The solution also contains FCS (fetal calf serum), 15% (v/v); oxalacetate, 1mmol/l; sodium pyruvate, 1mmol/l; insulin, 0.2 µg/ml; hIL-6, 1 ng/ml; phorbol myristate acetate, 10 ng/ml; phenol red.
Function (cell culture): Corresponds to reference
0.2 µm filtration (tested according to approved microbiological methods): Corresponds to reference
Stability: At -15 to -25°C within specification range for 24 months.

Quality

BM Condimed H1 is assayed for its ability to promote the growth of freshly fused hybridoma cells.

Background Information

BM Condimed H1 is added as a supplement (10%, v/v) to normal culture medium (basal medium, *e.g.* RPMI 1640, DMEM, IMDM) that also contains 10-20% FCS. Such a medium can support the growth of B-cell hybridomas, both after fusion and during cloning.
BM Condimed H1 should not be used at higher concentration, as basal medium or as a replacement for serum.

Cat. No.	Pack Size
04 155 645 001	custom fill

Will be supplied as "BM Condimed H1, Bulk". Unit of Measure is "Liter".

DRY ICE

For further processing only.

Chromozym TRY
powder

Chromozym TRY is used for the determination of trypsin activity.

Application
Substrate for the reliable photometically determination of activity of proteases which hydrolyze peptides at the carboxylic side of arginine (trypsin, endoproteinase Arg-C and others).

Benefits
- Perform precise trypsin activity determination.
- Decrease variance between different measurements.
- Enjoy the easy handling, especially in routine testing.

Product Description
Synthetic substrate showing low variance for different activity measurements. The increase in absorption at 405 nm is easily measured.

CAS: 52299-14-6

Properties
Nomenclature: Carbobenzoxy-L-valyl-L-glycyl-L-arginine-4-nitranilide acetate
Formula: $C_{27}H_{36}N_8O_7$
Molecular weight: 584.6 D
Formula: $C_{27}H_{36}N_8O_7$ x AcOH
Molecular weight: 644.7 D

Specification
Appearance: White to yellowish powder
Chromozym TRY, acetate: ≥89%
Chromozym TRY (enzymatically): ≥80%
Water (K. Fischer): ≤5%
4-Nitraniline, free: ≤0.5%
Stability: At +15 to +25°C within specification range for 24 months.

Background Information
A detailed test procedure is available upon request.

Cat. No.	Pack Size
10 378 496 103	custom fill

Will be supplied as "Chromozym TRY". Unit of Measure is "g".
For further processing only.

Glutathione, oxidized form (GSSG)
lyophilizate

Cat. No.	Pack Size
10 151 327 103	custom fill

Will be supplied as "Glutathione, Oxidized Form (GSSG)". Unit of Measure is "g".
For further processing only.

Application
Use GSSG for *in vitro* renaturation of proteins in inclusion bodies, and also as a reaction partner of GSH.

Benefits
- Use an animal component-free product to simplify approval processes.
- Rely on high lot-to-lot consistency and large scale production.

CAS: 27025-41-8

Properties
Formula: $C_{20}H_{32}N_6O_{12}S_2$
Molecular weight: 612.6 D

Specification
Appearance: White lyophilizate
Purity (enzymatically): ≥90%
Water (K. Fischer): ≤5.0%
Glutathione, reduced form (enzymatically): ≤0.5%
Fe (AAS): ≤20 ppm
Heavy metals (as Pb, AAS): ≤10 ppm
Stability: At +2 to +8°C within specification range for 36 months.

Glutathione, reduced form (GSH)
crystalline powder

Cat. No.	Pack Size
10 002 801 103	custom fill

Will be supplied as "Glutathione, Reduced Form (GSH)". Unit of Measure is "kg".
For further processing only.

GSH is used as a food supplement or fermentation media compound.

Application
Use GSH as an antioxidative to significantly reduce free radicals.

Benefits
- **Rely on high lot to lot consistency** and large scale production.

CAS: 70-18-8

Properties
Formula: $C_{10}H_{17}N_3O_6S$
Molecular weight: 307.3 D
Specific rotation [α] 25/D (water): -17° to -21°

Specification
Appearance: White, crystalline powder
Solubility: Clear, colorless in water (c=50 mg/ml)
A_{405} (hydrous solution, alkaline; 4.0 ml + 0.2 ml NaOH, 2 mol/l): ≤0.050
Melting range: +189 to +200°C
Purity (enzymatically and iodometric): ≥98%
Loss on drying (+105°C, 2 hours): ≤1%
Glutathione, oxidized form (enzymatically): ≤1.5%
Fe (bathophenanthroline): ≤5 ppm
Heavy metals (as Pb, AAS): ≤5 ppm
Methanol (GC): ≤50 ppm
Aceton (GC): ≤50 ppm
Ethanol (GC): ≤0.1%
Stability: At +2 to +8°C within specification range for 24 months.

GTP
disodium salt, powder

For best and consistent performance rely on long-term experience from the leading manufacturer of nucleotides.

Application
Use GTP as a coenzyme for protein biosynthesis in a cell-free system.

Benefits
- **Obtain consistent results.** Rely on the excellent lot-to-lot performance of this product.

CAS: 56001-37-7

Properties
Formula: $C_{10}H_{14}N_5O_{14}P_3Na_2$
Molecular weight:
GTP: 523.2 D
GTP-Na_2: 567.1 D

Specification
Appearance: White powder
GTP (enzymatically): ≥74%
GTP (A_{252}, ε=14.9 l x $mmol^{-1}$ x cm^{-1}): ≥74%
GTP (HPLC): ≥90 area%
Na (flame photometric): 8±1%
Water (K. Fischer): ≤10%
P_i: ≤0.9%
A_{250}/A_{260}: 1.15±0.03
A_{280}/A_{260}: 0.66±0.02
A_{290}/A_{260}: 0.28±0.01
Stability: At +2 to +8°C within specification range for 12 months. Store dry.

Cat. No.	Pack Size
10 150 398 103	custom fill

Will be supplied as "Guanosine-5'-triphosphate (GTP), Di-Na". Unit of Measure is "g".

DRY ICE

For further processing only.

Pepstatin

from *Streptomyces* species, lyophilizate

Pepstatin is a protease inhibitor.

Application

Use Pepstatin to inhibit potently the HIV protease and other aspartic proteases such as pepsin, renin, cathepsin D, chymosin, and many microbial acid proteases.

Benefits

- **Rely on an outstanding purity** of ≥98% according to HPLC analysis.
- **Increase the safety of your application processes** with reproducible performance and high lot-to-lot consistency.

Product Description

Pepstatin is a highly efficient inhibitor for many aspartic and acid proteases. It is a hexa-peptide containing the unusual amino acid statine (Sta, (3S,4S)-4-amino-3-hydroxy-6-methylheptanoic acid), having the sequence Iva-Val-Val-Sta-Ala-Sta. Pepstatin is known for its ability to inhibit pepsin in a picomolar concentration. The product is soluble in methanol and ethanol, but insoluble in water.

EC 3.4.14.9

Properties

Formula: $C_{34}H_{63}N_5O_9$
Molecular weight: 685.9 D
Pepstatin is soluble in methanol (1 mg/ml and 20 mg/ml as well) and ethanol (1 mg/ml) if you allowed to sit overnight, and to 300 µg/ml in 6 N acetic acid. Stable at least 1 week at +2 to +8°C or 1 month if stored in aliquots at -15 to -25°C.

Specification

Appearance: White powder
Melting range: 227-231°C
Solubility:
Clear to slightly opalescent, colorless solution in methanol (c=1 mg/ml)
Clear, colorless solution in methanol (c=20 mg/ml)
Clear to slightly opalescent, colorless solution in ethanol (overnight)
Purity (HPLC): ≥98 area%
Performance of inhibition of pepsin:
With 0.01 ml sample: ≥85%
With 0.1 ml sample: ≥100%
Values are taken from supplier certificate.
Stability: At +2 to +8°C within specification range for 24 months.

Quality

Pepstatin is highly purified according to HPLC analysis.

Cat. No.	Pack Size
10 253 294 103	custom fill

Will be supplied as "Pepstatin from Sreptomyces species". Unit of Measure is "g".
For further processing only.

01. Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under such patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

04. A license to perform the patented 5' Nuclease Process for research is obtained by the purchase of (i) both Authorized 5' Nuclease Core Kit and Licensed Probe, (ii) a Licensed 5' Nuclease Kit, or (iii) license rights from Applied Biosystems. This product is an Authorized 5' Nuclease Core Kit. Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under the applicable claims of US patents and corresponding claims outside the United States. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained from the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

05. Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

48. Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim, no right to perform any patented method, and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

49. Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, nontransferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

51. No license is conveyed with the purchase of this product under any US patent claims and corresponding patent claims outside the United States, or any other patents or patent applications, relating to the 5' Nuclease and dsDNA-Binding Dye Processes. For further information contact the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

62. NOTICE TO PURCHASER: DISCLAIMER OF LICENSE This product is optimized for use in the polymerase chain reaction (PCR) covered by patents owned by F. Hoffmann-La Roche Ltd ("Roche"). No license under these patents to use the PCR Process is conveyed expressly or by implication to the purchaser by the purchase of this product. A license to use the PCR Process for certain research and development activities accompanies the purchase of certain Roche, Applied Biosystems or other licensed suppliers' reagents when used in conjunction with an authorized thermal cycler, or is available from Applied Biosystems. Diagnostic purposes require a license from Roche. Further information on purchasing licenses may be obtained by contacting the Director of Licensing at Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

63. NOTICE TO PURCHASER: LIMITED LICENSE Use of this product is covered by US patent claims and corresponding patent claims outside the US.. The purchase of this product includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Licensing Department of Roche Molecular Systems, Inc., 4300 Hacienda Drive, Pleasanton, California 94588 or Roche Diagnostics GmbH, Sandhofer Strasse 116, 68305 Mannheim, Germany.

64. NOTICE TO PURCHASER: LIMITED LICENSE Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses under Roche patent claims require a separate license from Roche. Further information on purchasing licenses may be obtained by contacting the Licensing Department of Roche Molecular Systems, Inc., 4300 Hacienda Drive, Pleasanton, California 94588 or Roche Diagnostics GmbH, Sandhofer Strasse 116, 68305 Mannheim, Germany.

65. NOTICE TO PURCHASER: LIMITED LICENSE Use of this product is covered by US patent claims and corresponding patent claims outside the US. The purchase of this product includes a limited, non-transferable immunity from suit under the foregoing patent claims for using only this amount of product for the purchaser's own internal research. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. This product is for research use only. Diagnostic uses require a separate license from Roche. Further information on purchasing licenses for diagnostic applications may be obtained by contacting the Licensing Department of Roche Molecular Systems, Inc., 4300 Hacienda Drive, Pleasanton, California 94588, USA.

66. NOTICE TO PURCHASER: LIMITED LICENSE The purchase price of this product includes a limited, non-transferable license under US patent claims or non-U.S. counterparts owned by Roche Molecular Systems, Inc. or F. Hoffmann-La Roche Ltd to use only this amount of product solely for the research and development activities of the purchaser. No right under any other patent claim and no right to perform commercial services of any kind, including without limitation reporting the results of purchaser's activities for a fee or other commercial consideration, is conveyed expressly, by implication, or by estoppel. Further information on purchasing licenses to practice these patented processes may be obtained by contacting the Licensing Department of Roche Molecular Systems, Inc., 4300 Hacienda Drive, Pleasanton, California 94588 or Roche Diagnostics GmbH, Sandhofer Strasse 116, 68305 Mannheim, Germany.

The Following trademarks are trademarks of Roche

ABTS	EAGLETAQ	HIGH PURE	MAGNA PURE LC	STREPTAWELL
ACTITAQ	ENZYMUN-TEST	HYBPROBE	MGRADE	TAQMAN
AMPLICOR	ELECSYS	LC	MYCOTOOL	UNITOOL
AMPLITAQ	EXPAND	LIBERASE	NUCLEOMIX	X-TREMEGENE
APTATAQ	FASTSTART	LIGHTCYCLER	QUICKTAG	
BM CONDIMED	GENOPURE	LUMIGRADE	REALTIME READY	
COBAS	HAWKTAQ	MAGNA LYSER	RESOLIGHT	
COMPLETE and design	HAWKZO5	MAGNA PURE	SIMPLEPROBE	

Other Trademarks

ABI PRISM, CDP-Star, CSPD, StepOnePlus are trademarks of Life Technologies Corporation or its subsidiaries in the US and/or certain other countries.
SYBR is a registered trademark of Molecular Probes, Inc.
The ATCC trademark and trade name and any and all ATCC catalog numbers are trademarks of the American Type Culture Collection.
Tween is a registered trademark of ICI Americans, Inc., USA
Chromozym is a registered trademark of Pentapharm AG, Basle, Switzerland
CY and Sephadex are trademarks of GE Healthcare.
Eppendorf is a registered trademark of Eppendorf-NetherlerHinz GmbH.
FPLC is a registered trademark of Pharmacia Biotech AB, Uppsala, Sweden.
Genapol is a registered trademark of Hoechst AG, Frankfurt/M., Germany.
Triton and Kathon are trademarks of Rohm & Haas Company, Philadelphia, PA, USA.
LNA, ProbeFinder, and ProbeLibrary are registered trademarks of Exiqon A/S, Vedbaek, Denmark.
Nonidet is a registered trademark of Shell International Petroleum Company Limited, U.K.
Pefabloc is a trademark of DSM IP Assets B.V., Heerlen, Netherlands.
Thesit a registered trademark of Desitin-Werk, Carl Klinke GmbH, Hamburg, Germany.
Threshold is a registered trademark of Molecular Devices, UK.
xMAP is a registered trademark of Luminex Corporation, Austin, USA

Other brands or product names are trademarks of their respective holders

All business related to the sale of the Products listed in this catalog shall be subject to the following general **TERMS OF DELIVERY AND PAYMENT**. These terms may be superseded by terms set by the sales organization in your country. It is the responsibility of the Purchaser to inquire about the respective terms.

Orders
All orders and agreements are binding. When ordering, please be certain to indicate both catalog number and description of product. Minimum order value is U.S.$ 1,000.– or the equivalent in foreign currency. The Supplier retains the right to change the minimum order value in individual cases.

Prices
The prices in effect on the day the goods are ordered shall be applicable. Should the Purchaser object to this, the Supplier shall be entitled to unilaterally cancel the contract either in whole or in part, as far as quantities pending delivery are concerned.

Delivery
Any delivery time shall not be binding on the Supplier, but the Supplier shall use its best efforts to adhere to it. The Supplier shall be entitled to postpone or cancel his delivery obligations in whole or in part, in the event of interruptions of delivery caused by Force Majeure such as, but not limited to Acts of God, disturbances of company operation, strikes, or unavailability of transportation facilities. The Purchaser shall not be entitled to any claim for damages caused by delayed delivery.

Terms of Payment
Payment must be made net 30 days from the date of invoice. The Supplier retains the right to change these Terms of Payment upon mutual agreement with the Purchaser. All duties will be paid by the Purchaser.

Claims for Damage in Transit or Shortages
The Supplier must be informed about shipping discrepancies or damages in transit within 3 days of receipt of goods. In addition, the shipping company must be informed about damages in transit immediately upon receipt of goods, if such damages are concealed at the latest within 3 days upon receipt of goods.
In case of shipping discrepancies or damages in transit the Purchaser shall not be entitled to make deductions from the sales price or to hold back payment of same. Claims that are acknowledged by Supplier to fall under its responsibility shall be restricted to delivery of a satisfactory substitute.

Returning Material
No product may be returned without authorization from the Supplier. This authorization is necessary to ensure correct return of material and issuance of credit or exchange of material. Requests for permission to return products must be made within 10 days of receipt. Returned products should be clearly marked with sender's name and address, carefully packed and shipped prepaid. All returned products must be directed to the Supplier in writing. Products must be returned in the same condition as received and within 15 days of original shipment by Supplier.

WARRANTY
The Supplier warrants its products to the original purchaser against defects in materials and workmanship under normal use and application. The Supplier's sole obligation under this warranty shall be to replace defective products.
ALL PRODUCTS ARE DEVELOPED, DESIGNED AND SOLD FOR RESEARCH PURPOSES AND/OR USE IN MANUFACTURING. This warranty applies only to products in the original container that have been handled and stored in accordance with the Supplier's recommendations or instructions, and does not apply to a product which has been the subject to alteration, misuse or abuse. All claims under this warranty must be directed to the Supplier in writing and must be accompanied by a copy of the Purchaser's invoice.
THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN NO CASE SHALL THE SUPPLIER BE LIABLE FOR INCIDENTAL OR CONSEQUENTAL DAMAGES. Any modification of the above terms will be valid only if confirmed in writing by the Supplier at its corporate offices.

Retention of Title
All merchandise shall remain the property of the Supplier until all debts outstanding, including all current accounts receivable from the Purchaser have been paid in full.

IMPORTANT INFORMATION
Our preparations listed in this catalog are intended exclusively for further use in manufacturing, unless indicated otherwise. They are not for use on humans and animals.
The absence of a toxicity warning with one of our products does not, however, preclude a possible health hazard. With all of our products, due care should be exercised to prevent human contact and ingestion. All preparations should be handled only by trained personnel.
We reserve the right to change product specifications (e.g. buffer systems) as we see fit to improve product quality.

The sale of the Products to Purchaser does not grant Purchaser, unless indicated otherwise, any rights to or license on any patent application, patent or other intellectual proprietary right of Roche or its Affiliates. Thus, it is Purchaser's responsibility to identify and acquire such a right or license.

Further, it is Purchaser's obligation to check whether Purchaser's use or other commercialization of the Products requires any third party licenses and to acquire such a license. Purchaser shall indemnify Roche and its Affiliates from any third party claims resulting from a possible infringement of any third party intellectual property rights.

β

B

C

D

Published by
Roche Diagnostics GmbH
Sandhofer Straße 116
68305 Mannheim
Germany

custombiotech.roche.com

03064395990 (14) 0311