CustomBiotech Catalog 16th Edition
Molecular Diagnostics
You are driving a paradigm shift. Scientific and technological advances emerging from creative companies like yours are transforming the way we look at disease and breaking down barriers to novel treatments. The path to these innovations, however, is accompanied by many challenges. How do you secure a supply chain in a global landscape? How do you ensure compliance in a demanding regulatory environment? How do you remain competitive in a fast-paced market? Now more than ever, business success hinges on working with suppliers who understand your needs and allow you to focus on what matters most.

What if all your needs were met by a single partner — a market leader with decades of experience in Biotechnology and in vitro Diagnostics working side by side with your team?

Introducing Roche CustomBiotech.
Leveraging the unique know-how of Roche Diagnostics and Roche Pharmaceuticals, we work with you to deliver high-quality raw materials, instrumentation, products and services for your biopharmaceutical, cell therapy, or in vitro diagnostics business, customized to meet your unique quality and regulatory needs. Our support builds on four core benefits to help you succeed, from development to commercialization.

Innovation
Count on great ideas that work. From research and development to manufacturing and logistics, our experts and facilities cover an unparalleled spectrum of skills and technologies to explore any idea.

Security
Set your mind at ease. Our global reach, stringent standards and state-of-the-art manufacturing mean a secured supply of products and services to drive your business forward, when and where needed.

Customization
Invest time and resources into what you do best. For everything else, rely on us. With customized development, manufacturing, labeling, packaging and filling of components, we streamline the path of your product to market.

Service
Count on accessible and experienced support. From business and regulatory issues to production troubleshooting, we help safeguard your operations and market standing with fast answers to problems, anytime and anywhere.
Security and support with CustomBiotech

In your operations, behind your decisions, powering your products

Rely on a smart partner

As a long-standing industry leader, we have confronted many of the challenges you face as a diagnostics manufacturer. That experience and knowledge allows us to anticipate and overcome roadblocks. For you, this means access to unique insights from specialists who know the industry landscape and support from a team of experts who are passionate about solutions.

Secure your operations

At CustomBiotech, we are committed to support the long-term growth and evolution of your manufacturing — from small to large scale. Operating under stringent quality standards, we offer raw materials and assay components with proven lot-to-lot consistency in narrow specifications so that your products meet regulations. Our solutions enable streamlined workflows and traceable quality to strengthen your operational performance.

Visit us online at custombiotech.roche.com

- Explore all CustomBiotech products and services — also for molecular diagnostics and biopharma products and services
- Connect with your local Roche CustomBiotech representative
- Download product literature
- Obtain comprehensive information on products and applications

Our experts know and understand the industry landscape

World-class infrastructure
The Roche CustomBiotech Team
Your gateway to the worldwide Roche network

Center of Excellence - CustomBiotech headquarters in Penzberg

Our facilities in Penzberg are one of the largest and most productive biotechnology centers in Europe. With an unusual setup merging diagnostics and pharmaceutical know-how under one roof, Penzberg is a multidisciplinary incubator of novel technologies for production and automation processes, and a state-of-the-art manufacturer of high-quality raw materials and biotechnology products.
This catalog is designed to provide easy access to details about CustomBiotech raw materials for Molecular Diagnostics assays. For the most up-to-date product information, please visit custombiotech.roche.com, where you will find the entire CustomBiotech product portfolio.
Your Guide to the Sample Preparation Portfolio

Molecular Diagnostics Sample Preparation

Enzymes

Guanidine Hydrochloride

Crystals

Buffer for enzymatic assays of alkaline phosphatase.

**Application**

Use Guanidine hydrochloride as a denaturing agent for proteins in a broad variety of nucleic acid purification applications.

**CAS:** 50-01-1

**Properties**

- **Formula:** CH$_5$N$_3$ x HCl
- **Molecular weight:** 95.53 D
- **Appearance:** White, crystalline powder
- **Solubility:** Clear, colorless to slightly yellow (c=764.4 mg/mL in water, 8 mol/L)
- **Chloride (qualitative):** Positive
- **Melting range (Büchi):** +183 to +188°C
- **Guanidinium chloride (from N):** ≥99%
- **Guanidinium chloride (from Cl):** ≥99%
- **Nitrogen (elementary analysis):** 43.4–44.5%
- **Chloride (argentometric titration):** 36.6–37.5%
- **Heavy metals (as Pb):** ≤10 ppm
- **Fe:** ≤3 ppm
- **Stability:** At +15 to +25°C within specification range for 24 months.

**Specification**

- Will be supplied as “Guanidinium Chloride, Solid”.
- Unit of measure is “kg”.
- For further processing only.

**Legend:**

- GMP Grade

**Sample Preparation**

**Removal of DNA**

- RNase-free, rec.
- Lyo. 4 kU
- DNase I, rec.
- Lyo. 0.5 MU
- Lyo. 10 kU

**Removal of proteins**

- Guanidinium HCl custom fill
- Proteinase K, rec., PCR Grade

**KAPA Express Extract Kit**

- 1000 rxns

**Catalog number**

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<th>Catalog number</th>
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<td>500 g</td>
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Will be supplied as “Guanidinium Chloride, Solid”. Unit of measure is “kg”. For further processing only.
DNase I, recombinant, Grade I
from bovine pancreas, expressed in *Pichia pastoris*, lyophilizate

Recombinant DNase I is an essential tool for all applications requiring DNA-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
- Determining the “footprint” of a DNA-binding protein
- Microarray analysis

**Benefits**
- Achieve reliable results with undegraded and stable RNA.

**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

**Catalog numbers**
- 03 724 778 103: Will be supplied as “DNase I rec RGI (10 KU).” Unit of measure is “piece”.
- 05 952 077 103: Will be supplied as “DNase I rec.” Unit of measure is “piece”.

**For further processing only.**

**Specification**
- **Appearance:** White to slightly yellowish lyophilizate
- **Activity** (calf thymus DNA, hydrous solution): ≥10 kU/vial lyophilizate
  - For catalog number 03 724 778 103:
  - Purifying of RNA: 10,000 KU
  - To ensure that RT-PCR templates are free of genomic DNA
  - To remove DNA templates after *in vitro* transcription of RNA
- **Stability:** At +2 to +8°C within specification range for 24 months.

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DNase I, recombinant, RNase-free
from bovine pancreas, expressed in *Pichia pastoris*, solution

Recombinant DNase I is an essential tool for all applications requiring DNA-free RNA templates.

**Application**
Use DNase I, recombinant, for isolation of DNA-free RNA in diagnostic and therapeutic applications:
- To ensure that RT-PCR templates are free of genomic DNA
- To remove DNA templates after *in vitro* transcription of RNA

**Benefits**
- Achieve reliable results with undegraded and stable RNA.

**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 phosphodiester linkages of double- and single-stranded DNA to a mixture of mono- and oligonucleotides.

The enzyme is highly purified and rigorously tested for contaminating RNase and protease activity for superb RT-PCR.

**EC 3.1.21.1**

**Catalog numbers**
- 03 539 121 103: Will be supplied as “DNase I rec RNase-free in Glycerol”. Unit of measure is “kU”.

**For further processing only.**
Molecular Diagnostics Sample Preparation

DNase I, recombinant, RNase-free, GMP Grade
from bovine pancreas, expressed in Pichia pastoris, lyophilizate

Recombinant DNase I is an essential tool for all applications requiring DNA-free RNA templates.

**Application**
Use DNase I, recombinant, for isolation of DNA-free RNA in diagnostic and therapeutic applications:
• To ensure that RT-PCR templates are free of genomic DNA
• To remove DNA templates after in vitro transcription of RNA

**Benefits**
• Achieve reliable results with undegraded and stable RNA.
Rely on the highly purified and rigorously tested product that excludes RNase activity ensuring high sensitivity of your transcription reaction.

**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. The enzyme is highly purified and rigorously tested for contaminating RNase and protease activity for superb RT-PCR.

**EC 3.1.21.1**

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Proteinase K, recombinant, PCR Grade
from Titrirachium album, expressed in Pichia pastoris, solution

Recombinant Proteinase K in PCR Grade quality is a universal tool for nucleic acid template preparation.

**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**
• Maximize the yield of target nucleic acids.
Proteinase K is rigorously tested for the absence of nucleases.
• Experience stability and safety.
The solution is very stable and can be stored at room temperature for at least 18 months. The handling of the solution is safe and flexible.

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**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 yellowish, solution
- **Volume activity** (calf thymus DNA): 9–14 kU/mL
- **Volume activity** (calf thymus DNA, modified buffer system): Not detectable
- **Stability:** At –15 to –25°C within specification range for 24 months.

**Catalog number**
03 726 751 103
4 kU
Will be supplied as “DNase I, rec, lyo., 4 KU”.
Unit of measure is “piece”.
For further processing only.

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**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 powder
- **Activity** (with calf thymus DNA): ≥4.0 kU/vial
- **Ribonucleases** (up to 15 U with MS II RNA / 4 h / 37°C): Not detectable
- **Stability:** At +2 to +8°C within specification range for 12 months.

**Catalog number**
03 654 672 103
850 mL
Will be supplied as “Proteinase K, rec., PCR grade, solution”.
Unit of measure is “L”.
For further processing only.

**Stability of Proteinase K, recombinant solution**

- **Stability**
- **Temperature stability 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.**

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For more information please visit custombiotech.roche.com
### Molecular Diagnostics Sample Preparation

#### Enzymes

**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 endopeptidase 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 ensures 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).

#### Specification

**Appearance:** Clear, colorless solution  
**Volume activity** (+37°C, hemoglobin): ≥680 U/mL  
**Specific activity** (+37°C, hemoglobin): ≥28 U/mg protein  
**Unit definition** (Hemoglobin): One unit is the enzyme activity which releases 10 ng positive amino acids and peptides equivalent to 1 μmol of tyrosine in 1 minute under the test conditions.  
**Volume activity** (+25°C, Chromozym): ≥250 U/mL  
**Specific activity** (+25°C, Chromozym): ≥2.5 U/mg protein  
**Unit definition** (Chromozym): One unit is the enzyme activity which cleaves 18 mmol Chromozym TRY in 1 minute at +25°C.  
**Protein** (Biuret): 14.0-22.0 mg/mL  
**Unspecific endonucleases** (MMW 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.

**Molecular Diagnostics Sample Preparation**

**Proteinase K, recombinant, PCR Grade**

*From Tritirachium album, expressed in Pichia pastoris, solution*  
Recombinant Proteinase K in PCR Grade quality is a universal tool for nucleic acid template preparation.

**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**
- **Maximize the yield of target nucleic acids.** Proteinase K is rigorously tested for the absence of nucleases.  
- **Experience stability and flexibility.** The lyophilizate is very stable and can be stored at room temperature for at least 12 months. A broad range of fill volumes from 25 mg to 5 g per vial is available. Lyophilizate dissolved in water is stable for at least 60 days when stored at +2 to +4°C.

**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 endopeptidase 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 ensures 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).

**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 1 μmol 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 8 mmol Chromozym TRY in 1 minute at +25°C.  

**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.

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**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.

**EC 3.1.27.51**

**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 A₀ to A₁ in 1 minute under assay conditions (Kunitz). A₀ to A₁ corresponds to the total conversion, A₁ 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** (A ≤0.1, 15 minutes, +37°C): Corresponds to reference  
**Turbidity, according to Maniatis** (A₃₆₆ ≤0.100): Corresponds to reference  
**A₂₈₀ (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.
**KAPA Express Extract**

Fast and simple extraction of DNA for short PCR workflows in combination with PCR inhibitor-resistant DNA Masters.

**Application**

Extraction of PCR-ready DNA from, but not limited to, the following sample types:

- Human tissue (FFPE samples; blood collected in EDTA tubes or on collection cards; buccal swabs; hair follicles; forensic samples)
- Animal samples (ear or tail clippings; hair follicles; blood; bone marrow; dried or fresh tissue from mouse and other mammals)
- Fish tissues (fin punches; fresh tissue; cold and hot smoked canned samples; ethanol-preserved samples)
- Insects (crushed)
- Bird feathers (calamus fragments)

KAPA Express Extract gives best results when used together with PCR inhibitor-resistant DNA Masters such as KAPA2G Robust HotStart ReadyMix or KAPA3G HotStart Master.

**Benefits**

- **Shorten the time to prepare your sample.**
  A fast and simple protocol allows you to have the DNA PCR-ready in 15 minutes.
- **Be flexible.**
  The kit works with a variety of sample types.
- **Reduce risk of contamination.**
  Work only with single-tube reactions.

**Product description**

DNA extraction kit includes protease mix and extraction buffer.

**Properties**

KAPA Express Extract is a thermostable protease and buffer system that allows for the extraction of PCR-ready DNA from various tissue types in as little as 15 minutes. It is designed for optimal tissue lysis and sample preservation. Unlike protocols that rely on proteinase K digestion, DNA extractions with KAPA Express Extract are conveniently performed in a single tube, without the need for hazardous chemicals and multiple washing steps. This greatly reduces the risk of sample loss and contamination.

**Specification**

- **Volume activity**: 1 U/μL

Tests for the presence of contaminating nucleic acids

| (E.coli and related strains genomic DNA, 411 bp 16S rRNA fragment, <50 fg/μL); Corresponds to specification |
| (human genomic DNA, 290 bp b-actin fragment, <0.5 pg/μL); Corresponds to specification |

**Catalog number**

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<th>Pack size</th>
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<td>1000 reactions</td>
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Will be supplied as “KAPA Express Extract”.

For further processing only.

**Contents**

- 1 U/μL KAPA Express Extract
  - 4 x 500 μL tube
- 10X KAPA Express Extract Buffer
  - 4 x 5 mL bottle

Note: KAPA Express Extract is not suitable for DNA extraction from plants; for plant PCR applications, the KAPA3G Plant PCR Kit (08 041 091 001) is recommended.
Expand High Fidelity PCR System

Proofreading blend for accurate amplification of genomic DNA targets up to 5 kb using PCR.

**Application**
- 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)
- 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.

**Product description**
Enzyme blend consisting of Taq DNA Polymerase and Tgo DNA Polymerase.

**Properties**
- 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, dUTP, various labeled or modified nucleotides (200 μmol/L each is recommended of normal dNTP, increased concentrations of variants)
- Divalent ion requirement: Mg²⁺ (1.5 mmol/L standard concentration)
- Recommended usage per 50 μL reaction: 2.5 U (0.7 μL)

Expand High Fidelity PCR Buffer 10x conc., with MgCl₂

Standard reaction buffer for PCR using the Expand High Fidelity PCR System.

**Specification**
- Appearance: Clear, colorless solution
- Storage buffer: Tris/Cl, 500 mmol/L; (NH₄)₂SO₄, 220 mmol/L; MgCl₂, 15 mmol/L; pH approximately 8.8 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.
- RNases (MS2 RNA): Not detectable in up to 30 U after 1 hour incubation at +37°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

Proofreading blend for accurate amplification of genomic DNA targets up to 20 kb using 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 kDNA
- 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 long templates.
  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 higher yield compared to Taq DNA Polymerase.

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 activities:
- Taq Polymerase: Highly processive 5’-3’ DNA polymerase, double-strand specific 3’-5’ exonuclease activity
- Tgo Polymerase: Highly processive 5’-3’ DNA polymerase, double-strand specific 5’-3’ exonuclease activity (also known as proofreading activity), no 5’-3’ exonuclease activity

Temperature optimum:
- Fragment length <3 kb: Approximately +72°C
- Fragment length >3 kb: Approximately +88°C

Substrates: Incorporates dNTP, dUTP, various labeled or modified nucleotides

Divalent ion requirement: Mg²⁺ (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)

Stability
- At –15 to –25°C within specification range for 24 months.
- Will be supplied as “Expand LT PCR Sys. Enzymix, Bulk”.

Unit of measure is “kU”.

The enzyme is supplied without reaction buffer.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

Catalog number | Pack size
--- | ---
03 321 053 103 | custom fill

Molecular Diagnostics Amplification | DNA Polymerases

Catalog number | Pack size
--- | ---
03 707 628 103 | 5 kU
03 161 455 103 | 50 kU
03 707 628 103 | Will be supplied as “Taq DNA Polymerase Ind. GMP Grade, 5 kU”.
03 161 455 103: Will be supplied as “Taq DNA Polym GMP Grade 50 kU”.

Function test in PCR (human genomic DNA, 9,3,12, and 15 kb fragments, by using of 200 ng DNA positive): Corresponds to specification

Stability: At –15 to –25°C within specification range for 24 months.

Catalog number | Pack size
--- | ---
03 707 628 103 | 5 kU
03 161 455 103 | 50 kU

Molecular Diagnostics Amplification

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: 25 U/μL

Unspecific endonucleases (λDNA and MWM II DNA): Not detectable in up to 3 μL after 16 hours incubation at +65°C.

Nicking activity (pBR322 DNA): Not detectable in up to 3 μL after 16 hours incubation at +65°C.

Function test in PCR (human genomic DNA, 9,3,12, and 15 kb fragments, by using of 200 ng DNA positive): Corresponds to specification

Stability: At –15 to –25°C within specification range for 24 months.

Catalog number | Pack size
--- | ---
03 707 628 103 | 5 kU
03 161 455 103 | 50 kU

Molecular Diagnostics Amplification

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.

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.

Catalog number | Pack size
--- | ---
03 707 628 103 | 5 kU
03 161 455 103 | 50 kU
03 707 628 103: Will be supplied as “Taq DNA Polymerase Ind. GMP Grade, 5 kU”.
03 161 455 103: Will be supplied as “Taq DNA Polym GMP Grade 50 kU”.

The enzyme is supplied without reaction buffer.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

EC 2.7.7.7

Properties
- Taq DNA Polymerase is the robust standard enzyme for the amplification of DNA fragments up to 3 kb in PCR.

Catalog number | Pack size
--- | ---
03 707 628 103 | 5 kU
03 161 455 103 | 50 kU
03 707 628 103: Will be supplied as “Taq DNA Polymerase Ind. GMP Grade, 5 kU”.
03 161 455 103: Will be supplied as “Taq DNA Polym GMP Grade 50 kU”.

The enzyme is supplied without reaction buffer.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

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.
**Molecular Diagnostics Amplification**

**DNA Polymerases**

**Enzyme activities:**
- 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, dPUT, dITP; various labeled or modified nucleotides (200 μmol/L each is recommended of normal dNTP, increased concentrations of variants)
- Divalent ion requirement: Mg2+ (1.5 mmol/L standard concentration)

### 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 PCR.

**Application**
- For applications see Taq DNA Polymerase, GMP Grade, 5 U/μl

**EC 2.7.7.7**

**Properties**
- See Taq DNA Polymerase, GMP Grade, 5 U/μl

### 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 PCR. *lyo ready formulation* for preparation of dried amplification mixes.

**Catalog number**
- 11 147 633 103 (custom fill)

Will be supplied as “Taq DNA Pol., Glycerol-free”. Unit of measure is “kU”.

The enzyme is supplied without reaction buffer.

For further processing on its own or in a mixture as part of an IVD method only.

### 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 PCR. *lyo ready formulation* for preparation of dried amplification mixes.

**Catalog number**
- 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.

For further processing on its own or in a mixture as part of an IVD method only.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only — acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

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**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 deoxyribonucleoside triphosphates 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 using conventional blockcycler
- Function test in qPCR using LightCycler®
- Exonucleases (H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
- Function test in PCR using conventional blockcycler
- Animal-derived additives: None
- Stability: At -15 to -25°C within specification range for 24 months.

**Quality**
- Manufactured under GMP (Good Manufacturing Practice) regulations.
**Molecular Diagnostics Amplification**

**DNA Polymerases**

**AptaTaq DNA Polymerase, 5 U/μl**

**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.

**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 P 40, 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 (xDNA):** 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 (16-HDNA):** Not detectable in up to 30 U after 4 hours incubation at +65°C.

**Function test in qPCR using LightCycler® 480 System:** (2.3 ng of human genomic DNA, 339 bp FAP fragment): Corresponds to reference

**Animal-derived additives:** None

**Stability:** At -15 to -25°C within specification range for 24 months.

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**Molecular Diagnostics Amplification**

**DNA Polymerases, Hot Start**

**AptaTaq DNA Polymerase, 5 U/μl**

**from Thermus aquaticus BM, expressed in E. coli, solution**

Reversible hot start Taq DNA Polymerase without initial activation step for maximum stability combined with sensitivity and specificity.

**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.

**Catalog number**

05 457 882 103

**Pack size**

custom fill

Will be supplied as “AptaTaq DNA Polymerase, 5 U/μL”. Unit of measure is “kU”.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only - acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

**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.
**Molecular Diagnostics Amplification**

**DNA Polymerases, Hot Start**

**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 non-specific primer extension during PCR setup.

**Enzyme activities:**

- 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

**Stability:**

- Human genomic DNA, 339 bp tPA fragment: Corresponds to reference
- Using HybProbe probe format results in a sharp Tm peak at about 65°C

**Storage buffer**

- Clear, colorless solution
- Molecular Diagnostics
- Stability: At –15 to –25°C within specification range for 12 months.
- Volume activity: 5.5±0.5 U/μL
- Aptamer concentration (HPLC): 3.58 μmol/L ±10%
- UNSPECIFIC ENDONUCLEASES (3H-DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
- Exonucleases (3H-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 16S 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.

**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.
- Set up 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 in vitro diagnostic (IVD) kit manufacturers and end users.
- Prepare stable amplification mix in dry format.

Use this formulation for producing dried-down amplification mixes stable at room temperature.

**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

**Molecular Diagnostics Amplification**

**DNA Polymerases, Hot Start**

**AptaTaq DNA Polymerase, 50 U/μl**

_from Thermus aquaticus BM, expressed in E. coli, glycerol-free solution_

Reversible hot start Taq DNA Polymerase without initial activation step for maximum stability combined with sensitivity and specificity: Fully ready formulation for preparation of dried 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.
- Set up 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 in vitro diagnostic (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.

**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
AptaTaq DNA Polymerase LDx, 5 U/μl
from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Reversible hot start Taq DNA Polymerase without initial activation step for maximum stability combined with sensitivity and specificity in microbial testing.

**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 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. 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 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. Taq DNA Polymerase accepts dNTP analogs as substrates.

**Performance test in qPCR using LightCycler® 480 incubation at +65°C.**

Divalent ion requirement: Mg²⁺ (standard concentration, Half life at +95°C: Approximately 40 minutes

Temperature optimum for elongation pH optimum: Approximately 9.0 (+20°C)

AptaTaq DNA Polymerase accepts dNTP analogs as substrates.

**Stability**
- At –15 to –25°C within specification range for 24 months.
- High storage stability in refrigerator and freezer (24 months at +2 to +8°C and –25 to –25°C). Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The inherent stability of Taq DNA Polymerase is shown by the temperature optimum for elongation and stability at +95°C. Taq DNA Polymerase accepts dNTP analogs as substrates.

**Appearance**
Clear, colorless solution

**Specification**
- DNT: Approximately 200 μmol/L for each dNTP
- Storage buffer: Tri/HCl, 20 mmol/L; KCl, 100 mmol/L; EDTA, 0.1 mmol/L; Glycerol, 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)
- Apatemer concentration (HPLC): 35.75 μmol/L ±10%
- Unspecific endonucleases (UDNA): 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 (pH-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C

**Background information**
See AptaTaq DNA Polymerase, 5 U/μl
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: Mg²⁺ (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; KCl, 100 mmol/L; EDTA, 0.1 mmol/L; DT, 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)**: 3.58 μmol/L ±10%  
**Unspecific endonucleases (LdDNA)**: 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 (YH-DNA)**: Not detectable in up to 30 U after 4 hours incubation at +60°C.  
**Tests for the absence of contaminating nucleic acids**  
– (human genomic DNA, β- Globin fragment, S3 positive of 15 samples): Corresponds to specification  
– (LightCycler® UnTOOL ResoLight assay, detecting grampositive and grammegative bacterial DNA and fungal DNA, <1.0 copy genomic DNA/20 U enzyme): Corresponds to specification  
**Performance test in qPCR using LightCycler® 480**  
– Reaction time: Approximately 20 minutes for qPCR after initial activation step  
– Half life at +95°C: Approximately 40 minutes  
– Temperature optimum for elongation: Approximately +75°C  
– pH optimum: Approximately 9.0 (+20°C)  

**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. 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.  
- Prepare stable amplification mixes in dry format.  
- Use this formulation for producing dried-dawn 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 LDs 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

For additional information on the AptaTaq hot start system, see AptaTaq DNA Polymerase, 5 U/μL
**AptaTaq Δ exo DNA Polymerase, 5 U/μl**

From *Thermus aquaticus* BM, expressed in *E. coli*, solution

N-terminal truncated Taq DNA Polymerase with reversible hot start system and no 5'-3' exo activity for optimal detection of mismatches.

**Application**

Use AptaTaq Δ exo 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 Δ exo DNA Polymerase-based assay shows high specificity and a broad dynamic range of products.

**EC 2.7.7.7**

**Properties:**

AptaTaq Δ exo DNA Polymerase is active at temperature above +60°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 to +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.

**Divalent ion requirement:** Mg²⁺ (standard concentration, 1.5 mmol/L)

**dNTP requirement:** Approximately 200 μmol/L for each dNTP

**pH optimum:** Approximately 9 (adjusted at +20°C) and temperatures approximately +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 to +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.

**Temperature optimum for elongation:** Approximately +75°C

**Half life at +95°C:** Approximately 40 minutes

**Divalent ion requirement:** Mg²⁺ (standard concentration, 1.5 mmol/L)

**dNTP requirement:** Approximately 200 μmol/L for each dNTP

**Volume activity:** 55±5 U/μL

**Glycerol content:** ≤0.1% (v/v)

**Aptamer concentration:** (HPLC): 35.75 μmol/L ±10%

**Unspecific endonucleases (ulDNA):** 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:** (H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C

**Tests for the presence of contaminating nucleic acids** (human genomic DNA, gGlobin fragment): Corresponds to reference (LC UniTool Resolight assay, specific for grampssitive and gramnegative bacterial DNA and fungal DNA, <1.0 copy genomic DNA/20 U enzyme): Corresponds to specification

**Performance test in qPCR using LightCycler ® 480** (≥0.03 ng human genomic DNA): Corresponds to reference (3H-DNA): Not detectable in up to 30 U after 4 hours incubation at +37°C. Nicking activity: (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C. Exonucleases: (H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C. Stability: At -15 to -25°C within specification range for 12 months.

**Background information**

For information on LDx refer to AptaTaq DNA Polymerase LDx, 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.

**Amplicon:** 240 bp Apo B, hydrolysis probe format

**N-terminal truncated Taq DNA Polymerase with reversible hot start system and no 5'-3' exo activity for optimal detection of mismatches.**

**Application**

Use AptaTaq Δ exo 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 Δ exo DNA Polymerase-based assay shows high specificity and a broad dynamic range of products.

**EC 2.7.7.7**

**Properties:**

AptaTaq Δ exo DNA Polymerase is active at temperature above +60°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.
AptaTaqexo DNA Polymerase, 50 U/μl
from Thermus aquaticus BM, expressed in E. coli, glycerol-free solution

N-terminal truncated Taq DNA Polymerase with reversible hot start system and no 5'-3' exo and 3'-5' exonuclease activity for optimal detection of mismatches; lyo ready formulation for preparation of dried amplification mixes.

Application
Use AptaTaqexo 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.

Catalog number Pack size
05 364 086 103 custom fill

Will be supplied as “AptaTaqexo DNA Polymerase, Glyc.-free.”

For customers in the European Economic Area (contains SVHC: octyl/nonylphenol ethoxylates). For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only - sect. 11 Art. 36 (5) and 3 no. 23 REACH Regulation.

EC 2.7.7.7

Properties
AptaTaqexo DNA Polymerase is active at temperatures above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase itself is a highly processive 5'-3' DNA Polymerase lacking 5'-3' and 3'-5' exo nucleases. 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: Mg²⁺ (standard concentration, 2 mmol/L)
dNTP requirement: Approximately 200 μmol/L for each dNTP


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: 40 seconds at 40°C.

For more information please visit custombiotech.roche.com
**Molecular Diagnostics Amplification**

**EagleTaq DNA Polymerase, 5 U/μL**

*from Thermus aquaticus, expressed in *E. coli*, solution*

Hot start Taq DNA Polymerase for highly specific and sensitive amplification using PCR.

**Application**

- 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.
- Prevent the extension of non-specifically bound primers using this hot start enzyme.
- Obtain reliable results.

Use the gold standard of hot start polymerases for robust reaction performance.

**EC 2.7.7.7**

**Specification**

<table>
<thead>
<tr>
<th>Catalog number</th>
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<td>25 kU</td>
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| 05 206 944 190 | Will be supplied as “CMPNT EAGLETAQ 1 KU, 5 U/μL, 0.2 mL”.
|                | Unit of measure is “pieces”. |
| 05 206 952 190 | Will be supplied as “CMPNT EAGLETAQ 25 KU, 5 U/μL, 5 mL”.
|                | Unit of measure is “pieces”. |

For further processing only.

**AptaTaq Fast PCR Buffer**

5x concentrated

5x concentrated PCR buffer for AptaTaq DNA Polymerase (without dNTPs and MgCl₂) for high specificity, sensitivity and yield for all single- or multiplex PCR and qPCR applications.

**Application**

Standard reaction buffer for the AptaTaq DNA Polymerase

**Product description**

The composition of this 5x reaction buffer is optimized for fast activation and short PCR reaction times of the AptaTaq DNA Polymerase.

**Specification**

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<td>07 708 963 103</td>
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</table>

Will be supplied as “AptaTaq Fast PCR Buffer, 5x conc.”.

Unit of measure is “mL”.

For further processing only.

**AptaTaq DNA Polymerase, 5 U/μL**

*from Thermus aquaticus, expressed in *E. coli*, solution*

Hot start Taq DNA Polymerase for highly specific and sensitive amplification using PCR.

**Application**

- 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.
- Prevent the extension of non-specifically bound primers using this hot start enzyme.
- Obtain reliable results.

Use the gold standard of hot start polymerases for robust reaction performance.

**EC 2.7.7.7**

**Specification**

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| 05 206 944 190 | Will be supplied as “CMPNT EAGLETAQ 1 KU, 5 U/μL, 0.2 mL”.
|                | Unit of measure is “pieces”. |
| 05 206 952 190 | Will be supplied as “CMPNT EAGLETAQ 25 KU, 5 U/μL, 5 mL”.
|                | Unit of measure is “pieces”. |

For further processing only.
Molecular Diagnostics  Amplification  DNA Polymerases, Hot Start

**FastStart Taq DNA Polymerase, GMP Grade, 5 U/μl**

from *Thermus aquaticus* BM, expressed in *E. coli*, solution

Hot start Taq DNA Polymerase for highly specific and sensitive amplification using PCR.

**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**

- Achieve high specificity, sensitivity, and yield.
- Prevent the extension of non-specifically bound primers using this hot start enzyme.
- 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 activities:** 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, dUTP, dITP, various labeled or modified nucleotides (200 μmol/L each is recommended of normal dNTP, increased concentrations of variants)
- **Divalent ion requirement:** Mg²⁺ (1.5 mmol/L standard concentration)

**Specification**

- **Appearance:** Clear to slightly opalescent, 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
- **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 deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
- **Unspecific endonucleases (xDNA):** Not detectable in up to 25 U after 16 hours incubation at +37°C.
- **Nicking activity:** 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:** (50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to reference
  (human genomic DNA, 284 bp ApoE fragment): 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*

- Hot start Taq DNA Polymerase for highly specific and sensitive amplification using PCR.

**Application**
- For applications see FastStart Taq DNA Polymerase, GMP Grade, 5 U/μl

**Benefits**
- Achieve high specificity, sensitivity, and yield.
- Prevent the extension of non-specifically bound primers using this hot start enzyme.

**EC 2.7.7.7**

**Properties**
- See FastStart Taq DNA Polymerase, GMP Grade, 5 U/μl

**Specification**
- **Appearance:** Clear to slightly opalescent, 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 approximately 9.0 at +25°C
- **Volume activity:** 25 U/μL
- **Unit definition:** One unit Taq DNA Polymerase is defined as the amount of heat-activated enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
- **Unspecific endonucleases (αDNA):** 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**
  - (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 18 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*

- Concentrated hoatstart Taq DNA Polymerase for highly specific and sensitive amplification using PCR; suitable for preparation of dried amplification mixes.

**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

**Benefits**
- Achieve high specificity, sensitivity, and yield.
- Prevent the extension of non-specifically bound primers using this hoat start enzyme.

**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 deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
- **Unspecific endonucleases (αDNA):** 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 (H-DNA):** Not detectable in up to 15 U after 4 hours incubation at +65°C.

**Catalog number**
- 04 432 785 103

**Pack size**
- 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. For further processing only.**
Molecular Diagnostics Amplification DNA Polymerases, Hot Start

Function test in PCR
(50 pg human genomic DNA, 365 bp iPA fragment): Corresponds to reference
(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 PCR Buffer
10x conc., with 20 mM MgCl₂

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.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/L; (NH₄)₂SO₄, 50 mmol/L; KCl, 100 mmol/L; MgCl₂, 20 mmol/L; pH approximately 8.3 at +25°C
Unspecific endonucleases (αDNA): 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.

Catalog number | Pack size
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12 157 316 103 | custom-fill

Will be supplied as “PCR buffer (10X) w/o MgCl₂.”
Unit of measure is “μL.”
For further processing only.

Molecular Diagnostics Amplification DNA Polymerases, Hot Start

FastStart PCR Buffer
10x conc., without MgCl₂

Standard reaction buffer for PCR using FastStart Taq DNA Polymerase for optimization of the MgCl₂ 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 MgCl₂ concentration.

Specification
Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/L; (NH₄)₂SO₄, 50 mmol/L; KCl, 100 mmol/L; pH approximately 8.3 at +25°C
Unspecific endonucleases (αDNA, 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
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
10 ng human genomic DNA, 3.8 kb iPA fragment/ 1.8 kb EPO fragment: Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Catalog number | Pack size
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05 917 166 103 | 1 mL
12 151 494 103 | custom-fill

Will be supplied as “PCR buffer (10X) w/o MgCl₂.”
Unit of measure is “μL.”
For further processing only.

For more information please visit custombiotech.roche.com
HawkZ05 Fast DNA Polymerase, 200 U/μl
mutant from Thermus species Z05, recombinant in E. coli, glycerol-free solution

Reversible hot start DNA polymerase with high reverse transcriptase activity for one-step RT-PCR, allowing a fast RT-step: lyo ready formulation for preparation of dried amplification mixes.

**Application**

Apply HawkZ05 Fast DNA Polymerase for:
- Fast, 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
- Formulation of dried-down or lyophilized amplification reagents

**Benefits**

- Be flexible.
- Experience high performance.
  - Achieve reliable amplification of your low-copy RNA targets due to high temperature reverse transcription at +60 to +65°C and improved RNA processivity.
  - Achieve high sensitivity.
  - High fluorescence intensity results in lower Cp values and improves results for weakly positive samples.
- Prepare stable amplification mixes in dry format.
  - Use this formulation for producing dried-down amplification mixes stable at room temperature.

**Product description**

HawkZ05 Fast DNA Polymerase is a blend of Z05 DNA Polymerase and a specific oligonucleotide (aptamer) providing hot start feature. The concentrated, glycerol-free formulation is ready for lyophilization and suitable for the preparation of dry amplification mix preparations.

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Will be supplied as “HawkZ05 Fast DNA Pol, glycerol-free, 200 U/μL”.
Unit of measure is “kU”.
For further processing only.

**Properties**

HawkZ05 Fast DNA Polymerase is active at temperatures above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of unspecific primer extension. Z05 Fast DNA Polymerase is a mutant of the thermostable enzyme isolated from the thermophilic eubacterium Thermus species Z05, expressed in E. coli. In many aspects, the enzyme is very similar to Tth DNA Polymerase, however, it exhibits a higher stability under PCR conditions and allows for faster transcription.

**Enzyme activities**

- Highly processive 5’-3’ DNA polymerase; no 3’-5’ exonuclease activity; very fast intrinsic reverse transcriptase (RT) activity in the presence of manganese ions; 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 +65°C
- Divalent ion requirement for PCR: Mg²⁺
- Divalent ion requirement for RT activity and RT-PCR: Mn²⁺

**Substrates**

- Incorporates dNTP, dUTP, dITP, various labeled or modified nucleotides (200 μmol/L, each is recommended of standard dNTP, increased concentrations of variants)

**Specification**

- Appearance: Clear, colorless solution
- Volume activity: 265±85 U/μL
- Glycerol content: ≤0.1% (v/v)
- Aptamer concentration (HPLC): 188.7 μM±10%
- Double-strand specific endonucleases (MWM II DNA): Not detectable in 30 U enzyme after 1 hour incubation at +37 and +74°C.
- Double-strand specific exo5’-nuclease (MWM V DNA): Not detectable in up to 30 U enzyme after 1 hour incubation at +37°C.
- Stability: At -15 to -25°C within specification range for 12 months.
**Molecular Diagnostics Amplification**

**DNA Polymerases, Hot Start**

### Mn(OAc)₂ Stock Solution
25 mM

RT-PCR Grade Manganese acetate solution.

**Application**
Use Mn(OAc), Stock Solution in combination with HawkZ05 Fast DNA Polymerase to optimize the RT-PCR reaction.

**Specification**
- **Appearance**: Clear, colorless to slightly pink colored solution
- **Contents**: Manganese acetate, 25 mmol/L
- **Unspecific endonucleases (pDNA)**: 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** (10 ng human liver RNA, 630 bp MCAD fragment): Corresponds to specification
- **Stability**: At -15 to -25°C within specification range for 12 months.

**Properties**
KAPA3G HotStart DNA Polymerase is a highly inhibitor resistant Taq mutant that reduces effort and time for DNA purification enabling streamlined sample-to-result workflows.

**Specification**
- **Volume activity**: ≥30 U/µL
- **Unspecific endonucleases (plasmid DNA)**: Not detectable up to 10 U using pBR322 DNA/16 hours/+37°C
- **Exonucleases**: Not detectable up to 10 U using λ-DNA/16 hours/+37°C
- **E. coli DNA**: ≤100 pg E.coli DNA/mL enzyme
- **Human DNA**: ≤15 ng human DNA/mL enzyme

**KAPA3G HotStart DNA Polymerase, Glycerol-free, 30 U/µL**

from *Thermus aquaticus*, expressed in *E. coli*

KAPA3G HotStart DNA Polymerase is an antibody-mediated HotStart 3rd generation mutant of Taq specifically designed for fast and inhibitor-resistant PCR and formulated without glycerol for preparation of dried amplification mixes.

**Benefits**
- Evolved for exceptional speed – extension times down to 1 sec
- Made to tolerate inhibitors in blood, tissue and other samples
- Lys-ready: glycerol-free and high concentration of 30 U/µL

**Application**
Fast and robust DNA amplification out of samples containing PCR inhibitors.

**Product description**
The product consists of antibody-mediated KAPA3G HotStart DNA polymerase at 30 U/µL.

**Fluorescence**
- Patient sample or sample collection tubes
  - Hematin 50 µM
  - Bisulfite 0.3%
  - Ultra Serum 0.2%
  - Plasma EDTA 0.2%
  - Plasma Citrate 2%
- Nasal swab > 0.5%
- Stool > 3.5 ng/µl

**Sample preparation method**
- TriHart 0.5%
- EDTA 5%
- SDS 0.01%

**Properties**
KAPA3G DNA Polymerase exhibits robust performance in presence of a broad range of inhibitors

**Figure 1.** Of three tested polymerases, KAPA3G is the only one that performs well with a fast protocol. KAPA3G DNA Polymerase handles a one-second extension and denaturation times with ease, producing consistently high amplification curves. All polymerases were used according to manufacturer’s instructions (total assay run time: 23 minutes).

**Figure 2.** KAPA3G DNA Polymerase was tested with a broad range of inhibitors inherent to liquid biopsies, tissues or standard sample preparation methods. Tolerance is defined as a shift in Cq of ≤ 3 and in fluorescence of ≥ 50% of the control total fluorescence.

**Figure 3.** Lyophilized KAPA3G DNA Polymerase retains enzymatic activity even at high storage temperatures. Stored at 37°C for over 4 months the lyophilized format delivers the same high performance as non-lyophilized enzyme stored at -20°C.

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For more information please visit custombiotech.roche.com
**Molecular Diagnostics**

**Amplification**

**DNA Polymerases, Hot Start**

**KAPA3G PCR Buffer**

10x concentrated

KAPA3G PCR Buffer has been designed especially to be used with KAPA3G HotStart DNA Polymerase, Glycerol-free.

**Application**

Fast and inhibitor-tolerant DNA amplification with KAPA3G HotStart DNA Polymerase.

**Product description**

10x PCR reaction buffer

**Specification**

Appearance: clear, colourless solution

Performance test: on LightCycler 480 II

**KAPA2G Fast HotStart PCR Kit**

mutant from *Thermus aquaticus*, expressed in *E. coli*, plus 5x reaction buffer

Antibody-mediated hot start 2nd generation mutant of Taq, specifically designed for fast PCR.

**Application**

Fast amplification of DNA fragments up to 3 kb in PCR assays:

- Fast PCR
- Routine PCR
- Genotyping

**Benefits**

- Save valuable time.
  - Reach extension times as low as 1 sec/kb and reduce PCR reaction times by up to 75%.
- Work with difficult templates.
  - Cover a broad range of both AT- and GC-rich targets.

**Product description**

The kit contains 2 vials of antibody-mediated hot start DNA polymerase and all buffers necessary to optimize the amplification reaction.

**Properties**

KAPA2G Fast HotStart DNA Polymerase is a second-generation enzyme engineered for higher processivity and speed, offering significantly faster extension rates than wild-type Taq DNA Polymerase. In addition to speed, it provides higher yield and sensitivity than competitor enzymes across a broad range of targets.

**Catalog number**

08 041 202 001

**Pack size**

5000 U

Will be supplied as “KAPA2G Fast HotStart PCR Kit”.

Unit of measure is “piece”.

For further processing only.

**Contents**

- 5 U/μL KAPA2G Fast HotStart DNA Polymerase
  - 2 x 500 μl tube
- 5X KAPA2G Buffer A
  - 2 x 30 mL bottle
  - 25 mM MgCl₂
  - 2 x 10 mL bottle

**KAPA2G Robust HotStart PCR Kit**

mutant from *Thermus aquaticus*, expressed in *E. coli*, plus 5x reaction buffer

Antibody-mediated hot start 2nd generation mutant of Taq with improved inhibitor resistance.

**Application**

Amplification of DNA fragments up to 3 kb in PCR assays from a wide variety of templates. Particularly suited for:

- Assays which perform poorly with wild-type Taq
- Amplification of DNA fragments with high GC- or AT-content
- Amplification from template samples that contain PCR inhibitors (e.g. salts, urea, SDS, ethanol, EDTA) at concentrations that inhibit wild-type Taq
- Amplification from crude samples, e.g. colony PCR, or PCR from crude extracts, such as those prepared using KAPA Express Extract.

**Benefits**

- Make your PCR work even with crude samples.
  - KAPA2G Robust shows a high tolerance to inhibitor carry-over and allows you to work with crude samples (e.g. FFPE).
- Simplify your PCR workflow for difficult samples.
  - Work under the same protocols with GC- and AT-rich targets.

**Product description**

The kit contains 2 vials of antibody-mediated hot start DNA polymerase and all buffers necessary to optimize the amplification reaction.

**Catalog number**

08 041 121 001

**Pack size**

5000 U

Will be supplied as “KAPA2G Robust HotStart PCR Kit”.

Unit of measure is “piece”.

For further processing only.

**Contents**

- KAPA2G Robust HotStart DNA Polymerase (5 U/μl)
  - 2 x 500 μl
- KAPA2G Buffer A (5X)
  - 1 x 55 mL
- KAPA2G Buffer B (5X)
  - 1 x 55 mL
- KAPA2G GC Buffer (5X)
  - 1 x 55 mL
- KAPA Enhancer 1 (5X)
  - 1 x 55 mL
- KAPA MgCl₂ (25 mM)
  - 2 x 10 mL

**Catalog number**

08 041 121 001

**Pack size**

5000 U
**Molecular Diagnostics** Amplification DNA Polymerases, Hot Start

**Properties**
The second-generation KAPA3G Robust HotStart DNA Polymerase was evolved to solve inconsistent amplification across a broad range of amplicon types (GC- and AT-rich). It enables higher processivity and specific activity, which translates to robust PCR performance, high sensitivity, and improved tolerance to common inhibitors. The high performance of the KAPA3G Robust HotStart DNA Polymerase is ideally suited for challenging PCR applications and difficult samples, eliminating the need for optimization using multiple enzymes and protocols.

**Specification**
- **Volume activity**: 5 U/μL
- **Unspecific endonucleases** (plasmid DNA): Not detectable after 8 hours incubation at 37°C.
- **Exonucleases** (ODNA): Not detectable after 8 hours incubation at 37°C.

**KAPA3G Plant PCR Kit**
mutant from *Thermus aquaticus*, expressed in *E. coli*, plus 5x reaction buffer with dNTPs

PCR kit for processing crude samples or for direct PCR from crushed plant samples. Kit contains a 3rd gen. Taq mutant for maximum PCR inhibitor tolerance.

**Application**
The KAPA3G Plant PCR Kit is ideally suited for:
- Amplification of fragments up to 5 kb in size from purified plant DNA, extracted with commercial kits
- Direct PCR from leaf discs, seed samples, and other plant tissue types
- PCR from crude plant DNA extracts, prepared from leaf and/or seed material.

**Benefits**
- Perform direct PCR from a variety of plant species.
  Use KAPA3G Plant PCR Kit for samples such as leaf discs, seeds and crude plant extracts.
- Streamline your workflow and reduce turnaround time.
  Efficiently amplify long and difficult targets from all crude sample types.

**Molecular Diagnostics** Amplification DNA Polymerases, Hot Start

**Product description**
The kit contains hot start DNA polymerase, a reaction buffer including dNTPs, and separate Magnesium solution to optimize the amplification reaction.

**Properties**
The KAPA3G Plant PCR Kit is designed for PCR of plant-derived DNA, using either purified DNA or DNA prepared by crude extraction methods (crude sample PCR). In addition, the KAPA3G Plant PCR Kit can be used to amplify DNA from plant material added directly to the PCR (direct PCR).

**Specification**
- **Volume activity**: 2.5 U/μL
- **Unspecific endonucleases** (plasmid DNA): Not detectable after 8 hours incubation at 37°C.
- **Exonucleases** (ODNA): Not detectable after 8 hours incubation at 37°C.

<table>
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<th>Catalog number</th>
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<tbody>
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<td>06 041 051 001</td>
<td>1000 reactions</td>
<td>Will be supplied as “KAPA3G Plant PCR Kit”. Unit of measure is “piece”. For further processing only.</td>
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**Contents**
- KAPA3G Plant DNA Polymerase (2.5 U/μL)
  - 4 x 100 µL
- 2X KAPA Plant PCR Buffer
  - 4 x 6.25 mL
- MgCl₂ (25 mM)
  - 2 x 1.6 mL tube
**AptaTaq Genotyping Master**

5x concentrated

Reversible hot start DNA master mix without initial activation step for maximum stability combined with sensitivity and specificity: lyo ready formulation for preparation of dried amplification mixes.

**Application**

Use AptaTaq Genotyping Master in genotyping or other 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 can be dried-down without loss of performance.

**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.

- **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.

**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

**Molecular Diagnostics**

**Amplification**

**DNA Master**

---

**AptaTaq Genotyping Master (Rox)**

5x concentrated

Reversible hot start DNA master mix without initial activation step for maximum stability combined with sensitivity and specificity: lyo ready formulation for preparation of dried amplification mixes.

**Application**

Use AptaTaq Genotyping Master (Rox) in genotyping or other applications on instruments requiring normalization with Rox. AptaTaq Genotyping Master (Rox) is optimized for high-throughput applications using low reaction volumes. The master mix can be dried-down without loss of performance.

**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 -20°C within specification range for 12 months.

**Background information**

For information on the AptaTaq hot start system, see AptaTaq DNA Polymerase, 5 U/μl

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**Catalog number**

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</tbody>
</table>

**Molecular Diagnostics**

**Amplification**

**DNA Master**

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**AptaTaq Genotyping Master**

5x concentrated

Reversible hot start DNA master mix without initial activation step for maximum stability combined with sensitivity and specificity: lyo ready formulation for preparation of dried amplification mixes.

**Application**

Use AptaTaq Genotyping Master for preparation of dried amplification mixes.

**Benefits**

- **Gain flexibility.**
  - For customers in the European Economic Area: Contains SVHC:

<table>
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**SNP detection with HydroProbe 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.

For more information please visit custombiotech.roche.com
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.
- **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 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.

**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 violet 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 12 months.

**Background information**

For information on the AptaTaq hot start system, see AptaTaq DNA Polymerase, 5 U/μl

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**NxtScript DNA Master**

5x concentrated

Reversible hot start DNA master mix for multiplexing and as DNA master mix component in RT-PCR.

**Application**

Use NxtScript Reverse Transcriptase (07051166103) in combination with NxtScript DNA Master to run highly sensitive qRT-PCR reactions to detect RNA pathogens.

**Benefits**

- **Save time.**
  Take advantage of the aptamer technology and run a fast PCR protocol.
- **Achieve high sensitivity.**
  Detect low copy numbers of DNA or RNA targets with higher sensitivity using a 5x master mix concentration.
- **Ready for automation.**
  Set up your reaction at room temperature.

**Product description**

NxtScript DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix, containing AptaTaq DNA Polymerase in an optimized concentration for multiplex qPCR or qRT-PCR. It uses aptamer-mediated reversible hot start technology for specific priming and fast PCR. The mix contains dNTP mix with dUTP for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase.

**Properties**

NxtScript DNA Master is a sensitive and robust reaction mix for detection of DNA and RNA pathogens. It is stable at +2 to +8°C for 3 months and in its final reaction setup, for 4 hours at room temperature.

**Specification**

- **Appearance:** Clear colorless solution
- **Function test in qPCR**
  (human reference cDNA G6PDH/β2M fragments): Corresponds to reference
- **Stability:** At −15 to −25°C within specification range for 15 months.

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For more information please visit custombiotech.roche.com
ActiTaq \(\Delta\) exo Genotyping Master

5x concentrated

Hot start DNA master mix containing a 5'-3' exonuclease deficient hot start Taq DNA polymerase for optimal detection of mismatches.

Application

Use ActiTaq \(\Delta\) exo 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.
- Simplify PCR set-up.
  Pipette and handle the hot start reaction mix at ambient temperature.
- Simplify assay design.
  Create capable PCR assays with a minimum of optimization efforts, also multiplex PCR applications.

Product description

The 5x concentrated master mix contains a chemically modified truncated Taq DNA Polymerase and all reagents (except primers, probes, and template) needed for real-time DNA detection assays with various probe formats except for hydrolysis probes due to the lack of 5'-3' exonuclease activity.

EC 2.7.7.7

Properties

The master mix can be stored in the refrigerator (+2 to +8°C) for at least 4 week without loss of activity and performance. The complete PCR mix (Master + primers + probes + template) is stable for up to 24 hours at +15 to +25°C.

Specification

Appearance: Clear colorless solution

Performance test in qPCR (amplification with ApoB fragment):
Corresponds to specification

Sensitivity (≤100 copies; negative control 240 cycles): Corresponds to specification

Stability: At -15 to -25°C within specification range for 24 months.

KAPA2G Fast HotStart ReadyMix

2x concentrated

Antibody-mediated hot start DNA master mix for fast PCR containing a 2nd generation Taq mutant.

Application

Fast amplification of DNA fragments up to 3 kb:

- Fast PCR
- Routine PCR
- Genotyping

Benefits

- Save valuable time.
  Reach extension times as low as 1 sec/kb and reduce PCR reaction times by up to 75%.
- Work with difficult templates.
  Master mix is designed to work with AT- and GC-rich targets.

Product description

2x concentrated, ready-to-use antibody-mediated hot start PCR mix, containing KAPA2G DNA Polymerase in an optimized concentration for fast amplification protocols.

Properties

KAPA2G Fast HotStart DNA Polymerase is a second-generation (2G) enzyme engineered for higher processivity and speed, offering significantly faster extension rates than wild-type Taq polymerase. In addition to speed, it provides higher yields and sensitivity than competitor enzymes across a broad range of targets.

Specification

Unspecific endonucleases (plasmid DNA): Not detectable after 8 hours incubation at 37°C.

Exonucleases (λDNA): Not detectable after 8 hours incubation at 37°C.

Tests for the presence of contaminating nucleic acids
(λ, coli and related strains genomic DNA, 411 bp 16S rRNA fragment, <50 fg/μL): Corresponds to specification
(human genomic DNA, 280 bp b-actin fragment, <0.5 pg/μL): Corresponds to specification

Performance test (21 ng human genomic DNA): Corresponds to specification
KAPA2G Robust HotStart ReadyMix

2x concentrated

Antibody-mediated hot start DNA master mix with improved inhibitor resistance containing a 2nd generation Taq mutant.

**Application**
Amplification of DNA fragments up to 3 kb in PCR assays from a wide variety of templates. Particularly suited for:
- Assays which perform poorly with wild-type Taq
- Amplification of DNA fragments with high GC- or AT-content
- Amplification from template samples that contain PCR inhibitors (e.g. salts, urea, SDS, ethanol, EDTA) at concentrations that inhibit wild-type Taq
- Amplification from crude samples, e.g. colony PCR, or PCR from crude extracts, such as those prepared using KAPA Express Extract.

**Benefits**
- Simplify your workflow by working with crude samples. KAPA2G Robust shows high tolerance to inhibitor carryover and crude sample PCR (e.g. FFPE)
- Use the same protocol for difficult targets. Work with GC- and AT-rich targets and shorten optimization time of your assays

**Product description**
2x concentrated, ready-to-use antibody-mediated hot start PCR mix, containing KAPA2G DNA Polymerase in an optimized concentration for amplification of crude sample types and/or AT- or GC-rich targets.

**Properties**
The second-generation KAPA2G Robust HotStart DNA Polymerase was evolved to solve inconsistent amplification across a broad range of amplicon types (GC- and AT-rich). It enables higher processivity and specific activity, which translates to robust PCR performance, high sensitivity, and improved tolerance to common inhibitors. The high performance of the KAPA2G Robust HotStart DNA Polymerase is ideally suited for challenging PCR applications and difficult samples, eliminating the need for optimisation using multiple enzymes and protocols.

**Contents**
KAPA2G Robust HotStart ReadyMix (2X)
- 2 x 6.25 mL bottle, contains 2 mM MgCl₂ at 1x

**Specification**
Unspecific endonucleases (plasmid DNA): Not detectable after 8 hours incubation at 37°C.
Exonucleases (λDNA): Not detectable after 8 hours incubation at 37°C.
Tests for the presence of contaminating nucleic acids (E. coli and related strains genomic DNA, 411 bp 16S rRNA fragment, <50 fg/μL; Corresponds to specification (human genomic DNA, 290 bp b-actin fragment, <0.5 pg/μL): Corresponds to specification

**Performance test** (20.1 ng human genomic DNA): Corresponds to specification

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KAPA Probe Force

2x concentrated

Antibody-mediated hot start DNA master mix containing a 3rd generation PCR inhibitor-resistant Taq mutant.

**Application**
Use the qPCR master mix in application such as:
- Infectious disease testing
- Cancer research
- Food/water pathogen detection
- SNP genotyping
- GMO testing
- Mouse transgenics

**Benefits**
- Easily work with crude samples and benefit from broad tolerance to carry-over inhibitors.
- Obtain accurate and reproducible results with direct PCR from crude blood, tissue and plant extracts.
- Save valuable time and costs. Minimize the need for DNA purification and shorten your sample-to-result workflows to <1 hour.
- Expand your options in assay development.
- Use for multiplexing qPCR applications with hydrolysis probe assays on a broad range of platforms.

**Product description**
2x concentrated, ready-to-use antibody-mediated hot start PCR mix, containing KAPA3G DNA Polymerase in an optimized concentration for amplification of crude sample types. The master mix contains dUTP for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase.

**Contents**
2X KAPA PROBE Universal qPCR Master Mix
- 2 x 5 mL tube in 10 mL kits (8041237001)
- 1 x 50 mL tube in 50 mL kits (88041229001)
For more information please visit custombiotech.roche.com

Molecular Diagnostics Amplification

DNA Master

Properties
KAPA Probe Force is a highly inhibitor resistant qPCR master mix that removes the need for DNA purification, enabling streamlined sample-to-result workflows. The master mix contains a third generation (3G) DNA polymerase evolved to overcome blood, tissue, and plant PCR inhibitors. Crude samples can now be analyzed with comparable accuracy, reproducibility and sensitivity as purified DNA using KAPA Probe Force.

Specification
Performance test in qPCR (mouse genomic DNA, β-2 microglobulin): Corresponds to specification
Tests for the presence of contaminating nucleic acids (bacterial genomic DNA <10 fg per standard 20 μL reaction): Corresponds to specification (human genomic DNA not detectable in standard 20 μL reaction): Corresponds to specification

KAPA3G HotStart Master
10x concentrated

KAPA3G HotStart Master is specifically designed for fast and inhibitor-resistant PCR and formulated without glycerol for preparation of dried amplification mixes.

Application
The KAPA3G HotStart Master is a 10 fold concentrated PCR master mix containing KAPA3G HotStart DNA Polymerase, an antibody-mediated hot start third-generation mutant of Taq, specifically designed for fast PCR and resistance to common PCR inhibitors such as those found in human samples (blood, sputum, urine and stool), as well as carryover inhibitors from sample preparation.

Product description
Master Mix containing antibody-mediated KAPA3G HotStart DNA polymerase.

Properties
KAPA3G HotStart DNA Polymerase included in this Master Mix is a highly inhibitor resistant Taq mutant that reduces effort and time for DNA purification, enabling streamlined sample-to-result workflows.

Specification
Appearance: clear, colourless solution
Specification (human genomic DNA not detectable in standard 20 μL reaction): Corresponds to specification

M-MLV Reverse Transcriptase, GMP Grade
from Moloney Murine Leukemia Virus, expressed in E. coli

Properties
M-MLV Reverse Transcriptase, GMP Grade, is highly processive and generates full length cDNA with high efficiency. It has a lower RNase H activity than AMV Reverse Transcriptase and lacks endonuclease activity.

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, dUTP, various labeled or modified nucleotides

Divalent ion requirement: Mg²⁺

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 7.5
Volume activity: 200–300 U/μL
Specific activity: 2100 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 [3H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x(dT)₁₅ as substrate.
Purity (SDS PAGE): ≥90%

Unit of measure is "piece".

Catalog number Pack size
04 707 486 103 200 kU

Will be supplied as "M-MLV RT GMP Grade, 200 kU".
Unit of measure is “piece”.

The enzyme is supplied without reaction buffer.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

EC 2.7.7.49

For further processing only.

For more information please visit custombiotech.roche.com
NxtScript Reverse Transcriptase, conc.

M-MLV Reverse Transcriptase mutant designed for high thermostability and comparable performance to the market leader.

**Application**
Use NxtScript RT for synthesis of cDNA from total RNA or mRNA for:
- Two-step RT-PCR applications
- RT-PCR for detection of viral targets
- RT-PCR for detection of mRNA targets, such as cancer biomarkers
- Generation of full-length cDNA libraries
- Rapid amplification of cDNA ends (RACE)

**Benefits**
- Reverse transcribe difficult templates.
  The high thermostability of NxtScript allows reactions up to +60°C to overcome RNA secondary structures (e.g., in GC-rich templates).
- Achieve higher yield.
  NxtScript RT lacks RNase H activity. This results in higher cDNA yields.
- Stay specific.
  Make use of the wide temperature activity range of NxtScript and reverse transcribe at the temperature that is optimal for your RNA target.

**Properties**
NxtScript reverse transcriptase is highly thermostable and allows higher temperatures for reverse transcription, thus providing excellent results for difficult RNA targets.

- Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, low RNase H activity, no endonuclease activity.
- Recommended reaction temperature: +42 to +55°C
- Substrates: Incorporates dNTP, d3NTP, dUTP, and various labeled or modified nucleotides.
- Divalent ion requirement: Mg²⁺

**Catalog number**
07 051 166 103

**Pack size**
custom fill

Will be supplied as “NxtScript RT, conc.”. Unit of measure is “MU”.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

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NxtScript Reverse Transcriptase, 85 U/μl

M-MLV Reverse Transcriptase mutant designed for high thermostability and comparable performance to the market leader.

**Application**
Use NxtScript RT for synthesis of cDNA from total RNA or mRNA for:
- Two-step RT-PCR applications
- RT-PCR for detection of viral targets
- RT-PCR for detection of mRNA targets, such as cancer biomarkers
- TMA and NASBA nucleic acid amplification methods
- Generation of full-length cDNA libraries
- Rapid amplification of cDNA ends (RACE)

**Benefits**
- Reverse transcribe difficult templates.
  The high thermostability of NxtScript allows reactions up to +60°C to overcome RNA secondary structures (e.g., in GC-rich templates).
- Achieve high sensitivity.
  NxtScript lacks RNase H activity. This results in higher cDNA yields.
- Stay specific.
  Make use of the wide temperature activity range of NxtScript and reverse transcribe at the temperature that is optimal for your RNA target.
- Convenience.
  Apply this enzyme directly to your reaction mix without the need for dilution.

**Properties**
NxtScript reverse transcriptase is highly thermostable and allows higher temperatures for reverse transcription, thus providing excellent results for difficult RNA targets.

- Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, low RNase H activity, no endonuclease activity.
- Recommended reaction temperature: +42 to +55°C
- Substrates: Incorporates dNTP, d3NTP, dUTP, and various labeled or modified nucleotides.
- Divalent ion requirement: Mg²⁺

**Catalog number**
07 371 527 103

**Pack size**
80 μL

Will be supplied as “NxtScript RT, 85 U/μl, 80 μl”. Unit of measure is “piece”.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.
Molecular Diagnostics Amplification

Reverse Transcriptase

**Properties**
NxtScript reverse transcriptase is highly thermostable and allows higher temperatures for reverse transcription, thus providing excellent results for difficult RNA targets.

**Enzyme activities:** RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, low RNase H activity, no endonuclease activity.

**Recommended reaction temperature:** +42 to +55°C

**Substrates:** Incorporates dNTP, ddNTP, dUTP, and various labeled or modified nucleotides.

**Divalent ion requirement:** Mg²⁺

**Specification**

**Appearance:** White cap, clear colorless solution

**Function test in qPCR** (human reference cDNA G6PDH/β2M fragments): Corresponds to reference

**Stability:** At -15 to -25°C within specification range for 15 months.

**Catalog number**

| Pack size | 99 085 220 103 | custom fill |

**NxtScript 2G RT, conc.**
thermostable reverse transcriptase, 500 U/µL, glycerol-free solution

Highly concentrated, glycerol-free reverse transcriptase developed for high temperature reactions.

**Application**
Use NxtScript 2G RT for synthesis of cDNA from total RNA or mRNA for:
- Two-step and one-step RT-PCR applications
- RT-PCR for detection of viral targets
- RT-PCR for detection of mRNA targets, such as cancer biomarkers.

**Benefits**

- Improve sensitivity and specificity.
- High thermostability - no loss of activity even at the reaction temperature higher than +65°C for improved handling of secondary structures and difficult targets.
- Easily lyophilize your assays.
- High concentration (500 U/µL) and glycerol-free formulation allowing easy lyophilization and drying down.
- Stay specific.
- Make use of the wide temperature activity range of NxtScript 2G RT and reverse transcribe at the temperature that is optimal for your RNA target.

**Product description**
NxtScript 2G RT, conc. is a stand-alone reverse transcriptase. The highly concentrated and glycerol-free formulation makes the product suitable for lyophilization and for the preparation of dry amplification mixes.

**Properties**
NxtScript 2G reverse transcriptase is highly thermostable and allows high temperatures for reverse transcription, thus providing excellent results for difficult RNA targets.

**Recommended reaction temperature:** +55 to +70°C

**Substrates:** Incorporates dNTP, ddNTP, dUTP, and various labeled or modified nucleotides.

**Divalent ion requirement:** Mg²⁺

**Specification**

**Appearance:** Clear, colourless solution

**Volume activity:** > 500 U/µL

**Nicking activity** (pBR 322 DNA): Not detectable in up to 75 U after 16 hours incubation at +37°C.

**Unspecific endonucleases** (MWM III DNA): Not detectable in up to 75 U after 16 hours incubation at +37°C.

**RNases** (MS2 RNA): Not detectable in up to 75 U after 1 hour incubation at +37°C.

**E. coli DNA** ≤100 pg E. coli DNA/mL enzyme

**Human DNA** ≤15 ng human DNA/mL enzyme

**Performance test**
TwoStep RT-qPCR, β-Actin (on LC480 II with human reference RNA and β-Actin assay)

**Stability:** At -15 to -25°C within specification range for 12 months.
Transcriptor Reverse Transcriptase

**recombinant, expressed in E. coli**

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**

- 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)

**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, dUTP, various labeled or modified nucleotides

**Divalent ion requirement:** Mg²⁺

**Specification**

**Appearance:** Clear, colorless solution

**Storage buffer:** Potassium phosphate, 200 mmol/L; DTT, 2 mmol/L; Triton X-100, 0.2% (v/v); glycrol, 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 [3H]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 after 16 hours incubation at +37°C.

**Ribonucleases (MS2 RNA):** Not detectable after 4 hours incubation at +37°C.

**Stability:** At –15 to –25°C within specification range for 12 months.

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**Catalog number** 03 531 252 103

**Pack size** custom fill

Will be supplied as “Transcriptor Bulk”.

Unit of measure is “kU”.

The enzyme is supplied without a reaction buffer.

For customers in the European Economic Area: Contains SVHC: octyl/nonylphenol ethoxylates. For further processing on its own or in a mixture as part of an IVD method and under controlled conditions only – acc. to Art. 56 (3) and 3 no. 23 REACH Regulation.

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**Transcriptor RT Buffer**

5x concentrated

Standard reaction buffer for Transcriptor Reverse Transcriptase.

**Catalog number** 03 531 325 103

**Pack size** 1 mL

Will be supplied as “Transcriptor RT Buffer”.

Unit of measure is “piece”.

For further processing only.

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**Function test in RT-PCR (human skeletal muscle total RNA, 10 kb dystrophin gene fragment):** Corresponds to reference

**Stability:** At –15 to –25°C within specification range for 24 months.

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**Function test in real-time RT-qPCR using the LightCycler® instrument (PBGD gene fragment from RNA standards):**

**Stability:** At –15 to –25°C within specification range for 12 months.
### Molcular Diagnostics Amplification

**T7 RNA Polymerase, recombinant, GMP Grade**

Expressed in *E. coli*

T7 RNA Polymerase is used for *in vitro* transcription of RNA from a DNA Template.

**Application**

T7 RNA Polymerase is a key enzyme for *in vitro* transcription reactions to produce e.g. therapeutic mRNA.

**Specification**

**Appearance:** Clear, colorless solution

**Volume Activity:** ≥1000 kU/mL

**Protein (abs 280nm):** 0.8-1.2 mg/mL

**Purity (SDS-PAGE):** ≥95 %

**Unspecific nuclease** (up to 300 ng enzyme using MWM III-DNA; 16 h/37°C): not detectable

**Nicking activity** (up to 300 ng enzyme using pBR 322-DNA; 16 h/37°C): not detectable

**RNase activity** (up to 300 ng enzyme using MS II-RNA; 1 h/37°C): not detectable

**Proteases** (50 μg/15 min/37°C): not detectable

**Exonucleases** (using 1 μg): not detectable

**Endotoxins:** ≤10 EU/mL

**Total Bio burden:** ≤10 CFU/mL

**E. coli HC DNA:** ≤100 pg/mg protein: corresponds

**E. coli HC protein:** ≤50 ppm: corresponds

**Heavy metals (Ni, Co, V):** ≤10 ppm

**Stability:** At -25°C to -15°C within specification range for 18 months.

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<td>07 144 660 103</td>
<td>10 mL</td>
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</tbody>
</table>

**Unit of measure is "piece".**

For further processing only.

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**Molecular Diagnostics Amplification**

**HawkZ05 Fast One-Step RT-PCR Master (Rox)**

2.3x concentrated

Reversible hot start one-step RT-PCR master mix with fast RT-step and high stability.

**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
- Instruments requiring normalization with Rox

**Benefits**

- Be flexible.
  - HawkZ05 Fast One-Step RT-PCR Kit enables amplification of both RNA and DNA targets.
- Experience high performance.
  - Achieve reliable amplification of your low-copy RNA targets due to high temperature reverse transcription at +60 to +65°C and improved RNA processivity.

**Product description**

HawkZ05 Fast One-Step RT-PCR Kit is supplied as a kit containing 1 vial of HawkZ05 Fast One-Step RT-PCR Master Mix and 1 vial of RMS Manganese Acetate (25 mM). The master mix contains a reference dye (FRET-Rox) to run assays on real-time PCR instruments which require Rox for quantitative analysis.

**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 1x10^6 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.
HawkZ05 Fast One-Step RT-PCR Master
5x concentrated, 0.5% glycerol content

Reversible hot start one-step RT-PCR master mix with fast RT-step and high stability. **lyo ready formulation** for preparation of dried amplification mixes.

**Application**
Apply HawkZ05 Fast One-Step RT-PCR Lyo Kit for:
- Preparation of dried reaction mixes
- High-throughput quantitative gene expression analysis
- Detection of rare transcripts
- Reverse transcription and amplification of RNA from limited samples

**Benefits**
- Be flexible. HawkZ05 Fast One-Step RT-PCR Kit enables amplification of both RNA and DNA targets.
- Experience high performance. Achieve reliable amplification of your low-copy RNA targets due to high temperature reverse transcription at +60 to +65°C and improved RNA processivity.
- Prepare stable amplification mixes in dry format. Use this formulation for producing dried-down amplification mixes stable at room temperature.

**Product description**
HawkZ05 Fast One-Step RT-PCR Kit is supplied as a kit containing 2 vials of HawkZ05 Fast One-Step RT-PCR Master Mix and 2 vials of RMS Manganese Acetate (25 mM). The formulation contains 0.5% glycerol and is especially suited for the preparation of dry amplification mix preparations.

**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.

**Catalog number**
<table>
<thead>
<tr>
<th>Catalog number</th>
<th>Pack size</th>
</tr>
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<tbody>
<tr>
<td>06 402 203 190</td>
<td>1 kit</td>
</tr>
<tr>
<td>06 402 205 190</td>
<td>1 kit</td>
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06 402 203 190: Will be supplied as "KIT HAWKZ05 1STEP RT-PCR LYO W/O ROX 5 mL".
Unit of measure is "piece".
06 402 205 190: Will be supplied as "KIT HAWKZ05 1STEP RT-PCR LYO W/O ROX 50 mL".
Unit of measure is "piece".
For further processing only.

1. HawkZ05 Fast One-Step RT-PCR Master Mix
2. RMS Manganese Acetate (25 mM)

---

HawkZ05 Fast One-Step RT-PCR Master (Rox)
5x concentrated, 0.5% glycerol content

Reversible hot start one-step RT-PCR master mix with fast RT-step and high stability. **lyo ready formulation** for preparation of dried amplification mixes.

**Application**
Apply HawkZ05 Fast One-Step RT-PCR Lyo Kit for:
- Preparation of dried reaction mixes
- High-throughput quantitative gene expression analysis
- Detection of rare transcripts
- Reverse transcription and amplification of RNA from limited samples
- Instruments requiring normalization with Rox

**Benefits**
- Be flexible. HawkZ05 Fast One-Step RT-PCR Kit enables amplification of both RNA and DNA targets.
- Experience high performance. Achieve reliable amplification of your low-copy RNA targets due to high temperature reverse transcription at +60 to +65°C and improved RNA processivity.
- Prepare stable amplification mixes in dry format. Use this formulation for producing dried-down amplification mixes stable at room temperature.

**Product description**
HawkZ05 Fast One-Step RT-PCR Kit is supplied as a kit containing 2 vials of HawkZ05 Fast One-Step RT-PCR Master Mix and 2 vials of RMS Manganese Acetate (25 mM). The master mix contains a reference dye (FRET-ROX) to run assays on real-time PCR instruments which require Rox for quantitative analysis.

**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.

**Catalog number**
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06 402 232 190: Will be supplied as "KIT HAWKZ05 1STEP RT-PCR LYO W/ROX 5 mL".
Unit of measure is "piece".
06 402 267 190: Will be supplied as "KIT HAWKZ05 1STEP RT-PCR LYO W/ROX 50 mL".
Unit of measure is "piece".
For further processing only.

1. HawkZ05 Fast One-Step RT-PCR Master Mix (Rox)
2. RMS Manganese Acetate (25 mM)
EvoScript RNA Master

5x concentrated

True one-tube 5x hot start RT-qPCR master mix for maximum ease-of-use. Ideal for high specificity and high-precision one-step RT-qPCR reactions.

Application

Use EvoScript RNA Master for hot start one-step RT-qPCR reactions that require high specificity and performance. It is compatible with hydrolysis probe and hybridization probe formats.

Benefits

- **Save time.**
  Just add primers, probes, and template to get started.
- **Be flexible.**
  Use a variety of sample materials (e.g., whole blood, FFPE).
- **Achieve high sensitivity.**
  Detect down to 10 copies of RNA target.
- **Ready for automation.**
  Set up your reaction at room temperature.
- **Prevent carryover contamination.**
  The mix is compatible with UNG protocols to prevent false positives.

Product description

EvoScript RNA Master is a perfect master mix for convenient RT-qPCR reactions. It includes FastStart Taq DNA Polymerase and a designer polymerase for reverse transcription. It uses a sophisticated hot start system that includes chemical modification and aptamer-mediated hot start. This enables highly specific priming for both, reverse transcription and DNA amplification. The 1-vial composition is ideally suited for easy reaction assembly with just the addition of oligos and target RNA.

Properties

EvoScript RNA Master (5x) is stable at room temperature for 24 hours and at a final (1x) dilution including primers and probes for 4 hours. The mix contains dUTP, so that it may be used with Uracil-DNA Glycosylase to prevent false positives arising from carryover contamination (i.e., contamination with amplified DNA).

Specification

**Appearance:** Colorless solution

**Function test RT-qPCR, G6PDH (on LC480 II with human reference RNA and G6PDH assay):** Corresponds to reference

**Stability:** At -15 to -20°C within specification range for 15 months.
### Your Guide to the Nucleotide Portfolio

#### dNTPs PCR Grade

<table>
<thead>
<tr>
<th>dNTP</th>
<th>dATP</th>
<th>dCTP</th>
<th>dGTP</th>
<th>dTTP</th>
<th>dUTP</th>
<th>dTTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counter ion</td>
<td>Sodium salt</td>
<td>Sodium salt</td>
<td>Sodium salt</td>
<td>Sodium salt</td>
<td>Sodium salt</td>
<td>Sodium salt</td>
</tr>
<tr>
<td>Regulatory status</td>
<td>GMP Grade</td>
<td>GMP Grade</td>
<td>GMP Grade</td>
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<td>8.3 ± 0.2</td>
<td>8.3 ± 0.2</td>
<td>8.3 ± 0.2</td>
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<td>99.9%</td>
<td>99.9%</td>
<td>99.9%</td>
<td>99.9%</td>
<td>99.9%</td>
</tr>
<tr>
<td>Concentration</td>
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<td>100 mM</td>
<td>100 mM</td>
<td>100 mM</td>
<td>100 mM</td>
<td>100 mM</td>
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<td>12 158 124 103</td>
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<td>11 889 559 103</td>
<td>11 889 532 103</td>
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#### dNTPs

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<tr>
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<th>dS-dCTP</th>
<th>7-deaza-dGTP</th>
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<td>Lithium salt</td>
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### NucleoMixes PCR Grade

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<td>8.3 ± 0.2</td>
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<td>10 mM</td>
<td>10 mM</td>
</tr>
<tr>
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</tr>
<tr>
<td>Conc. dGTP</td>
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<td>Conc. dTTP</td>
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<td>10 mM</td>
<td>10 mM</td>
<td>10 mM</td>
</tr>
<tr>
<td>Conc. dUTP</td>
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<td>10 mM</td>
<td>10 mM</td>
<td>10 mM</td>
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<tr>
<td>UoM</td>
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### NTPs Molecular Diagnostics Grade

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<tr>
<td>pH</td>
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<td>Purity</td>
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<td>99.9%</td>
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<tr>
<td>UoM</td>
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<td>CTP</td>
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<td>GTP</td>
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<tr>
<td>UTP</td>
<td>06 529 224 103</td>
<td>11 983 980 103</td>
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</table>
Molecular Diagnostics  
Amplification  
Nucleotides

**dATP, PCR Grade**  
sodium salt, 100 mM

GMP-manufactured dNTPs from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**Application**
dATP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for in vitro diagnostics.

**Product description:**
dATP, PCR Grade, is supplied in sealed and CO₂-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:** C₁₀H₁₆N₅O₁₂P₃
- **Molecular weight:** 491.2 D

**Specification**
- **Appearance:** Clear, colorless solution
- **pH value:** 8.1–8.5
- **dATP** (1 μmol 15.0 A₂₆₀ 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
- **A₂₅₀/A₂₆₀:** 0.78±0.02
- **A₂₈₀/A₂₆₀:** ≤0.02
- **Function test in RT-PCR** (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
- **Stability:** At -15 to -20°C within specification range for 42 months.

**Quality**
Manufactured under GMP (Good Manufacturing Practice) regulations.

<table>
<thead>
<tr>
<th>Catalog number</th>
<th>Pack size</th>
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<tbody>
<tr>
<td>04 631 056 103</td>
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<table>
<thead>
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<th>Catalog number</th>
<th>Pack size</th>
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<tbody>
<tr>
<td>04 631 072 103</td>
<td>20 mL</td>
</tr>
<tr>
<td>11 889 508 103</td>
<td>100 mL</td>
</tr>
</tbody>
</table>

**dCTP, PCR Grade**  
sodium salt, 100 mM

GMP-manufactured dNTPs from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**Application**
dCTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for in vitro diagnostics.

**Product description**
dCTP, PCR Grade, is supplied in sealed and CO₂-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:** C₉H₁₆N₃O₁₃P₃
- **Molecular weight:** 467.2 D

**Specification**
- **Appearance:** Clear, colorless solution
- **pH value:** 8.1–8.5
- **dCTP** (1 μmol 9.6 A₂₇₂ 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
- **A₂₅₀/A₂₆₀:** 0.82±0.02
- **A₂₈₀/A₂₆₀:** 0.97±0.02
- **A₂₉₀/A₂₆₀:** 0.30±0.02
- **Function test in RT-PCR** (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification
- **Stability:** At -15 to -20°C within specification range for 42 months.

**Quality**
Manufactured under GMP (Good Manufacturing Practice) regulations.

<table>
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<th>Pack size</th>
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<tr>
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<td>20 mL</td>
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<tr>
<td>11 889 508 103</td>
<td>100 mL</td>
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</table>
**Molecular Diagnostics**

**Amplification**

### α-S-dCTP, Molecular Diagnostic Grade

**S-isomer, sodium salt, 100 mM**

Modified dCTP for Strand Displacement Amplification and other special applications.

**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.

**Product description**

α-S-dCTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-proof bottles to ensure a stable pH during shipment on dry ice.

**Properties**

Nomenclature: α-Thio-2’-deoxy-cytidine-5’-triphosphate

Formula: C₉H₁₆N₃O₁₂SP₃ x H₂O

Molecular weight: 483.2 D

**Specification**

Appearance: Colorless solution

pH value: 8.1–8.5

α-S-dCTP (1 μmol / 9.6 A₂₅₀ units): 90–100 mmol/L

α-S-dCTP, S-Isomer (HPLC): ≥98.0 area%

DNases/RNases: Negative

Nicking activity: Negative

A₂₅₀/A₂₆₀: 0.80–0.84

A₂₆₀/A₂₈₀: 0.95–1.00

A₂₈₀/A₂₉₀: 0.38–0.32

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.

---

### dGTP, PCR Grade

**sodium salt, 100 mM**

GMP-manufactured dNTP’s from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**Application**

dGTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for in vitro diagnostics.

**Product description**

dGTP, PCR Grade, is supplied in sealed and CO₂-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: C₁₀H₁₆N₅O₁₃P₃

Molecular weight: 507.2 D

**Specification:**

Appearance: Clear, colorless solution

pH value: 8.1–8.5

dGTP (2 μmol / 13.7 A₂₅₀ 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

A₂₅₀/A₂₆₀: 1.15±0.03

A₂₆₀/A₂₈₀: 0.67±0.02

A₂₈₀/A₂₉₀: 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.

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**Catalog number**

| Pack size | 12 207 095 103 | custom fill | Will be supplied as “α-thio-d-CTP, Solution (Mol-DIA)”. Unit of measure is “μmol”. For further processing only.

**Catalog number**

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<tr>
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</tbody>
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04 631 129 103: Will be supplied as “dGTP PCR Grade, Sodium Solution, 20 mL”. Unit of measure is “μmol”. 11 889 524 103: Will be supplied as “dGTP, Na, Solution (PCR Grade)”. Unit of measure is “μmol”. For further processing only.
7-Deaza-2’-dGTP
Lithium salt, 10 mM

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.

Properties
Nomenclature: 7-Deaza-2’-deoxy-guanosine-5’-triphosphate
Formula: C_{11}H_{17}N_{4}O_{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 \( \Delta \), 13.4 A_{259} units): 10.0–11.0 mmol/L
7-Deaza-2’-dGTP (HPLC): ≥95 area%
7-Deaza-2’-dGDP (HPLC): 2-4 area%
A_{250}/A_{260}: 0.84±0.04
A_{260}/A_{280}: 0.85±0.03
A_{280}/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, dITP 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.

Catalog number 10 982 891 103 Pack size 100 mL

Will be supplied as “7-Deaza-2’-deoxy-GTP, Di-Li”.
Unit of measure is "μmol".
For further processing only.

Molecular Diagnostics Amplification
Nucleotides

diTP, PCR Grade
Sodium salt, 100 mM

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(dT) x poly(dC) and poly[d(I-C)] with DNA polymerase and dCTP.

Product description
diTP, PCR Grade, is supplied in sealed and CO₂-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_{4}O_{13}P_{3}
Molecular weight: 492.2 D

Specification
Appearance: Clear, colorless solution
pH value: 8.1–8.5
diTP (1 μmol \( \Delta \), 12.3 A_{249} units, pH 7.0): 100–110 mmol/L
diTP (high resolution HPLC method): ≥99 area%
diDP (HPLC): 50.9 area%
DNases/RNases: Negative
Nicking activity: Negative
A_{250}/A_{260}: 1.67±0.03
A_{260}/A_{280}: 0.25±0.03
A_{280}/A_{260}: 0.03±0.02
Stability: At –15 to –25°C within specification range for 42 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Catalog number 12 108 124 103 Pack size 100 mL

Will be supplied as “Desoxy-ITP, Na-Lsg., (PCR-Grade)”. Unit of measure is "μmol".
For further processing only.
**Molecular Diagnostics**

**Amplification**

**Nucleotides**

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**dTTP, PCR Grade**

sodium salt, 100 mM

GMP-manufactured dNTP's from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**Application**

ddTTP, PCR Grade, is designed for amplification reactions where high-quality reagents are required, such as for in vitro diagnostics.

**Product description**

ddTTP, PCR Grade, is supplied in sealed and CO₂-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:** C₁₀H₁₇N₂O₁₄P₃
- **Molecular weight:** 482.2 D

**Specification**

- **Appearance:** Clear, colorless solution
- **pH value:** 8.1–8.5
- **dTTP** (1 μmol = 9.5 A₄₅₀ 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  
  **A₂₅₀/A₂₆₀:** 0.64±0.02  
  **A₂₈₀/A₂₆₀:** 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.

<table>
<thead>
<tr>
<th>Catalog number</th>
<th>Pack size</th>
<th>Unit of measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 631 137 103</td>
<td>20 mL</td>
<td>μmol</td>
</tr>
<tr>
<td>11 889 559 103</td>
<td>100 mL</td>
<td>μmol</td>
</tr>
</tbody>
</table>

---

**dUTP, PCR Grade**

sodium salt, 100 mM

GMP-manufactured dNTP's from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**Application**

ddTTP, 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.

**Product description**

ddTTP, PCR Grade, is supplied in sealed and CO₂-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:** 1573-82-6

**Properties**

- **Nomenclature:** 2'-Deoxy-uridine-5'-triphosphate
- **Formula:** C₉H₁₅N₂O₁₄P₃
- **Molecular weight:** 468.2 D

**Specification**

- **Appearance:** Clear, colorless solution
- **pH value:** 8.1–8.5
- **dUTP** (1 μmol = 9.9 A₂₆₀ 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  
  **A₂₅₀/A₂₆₀:** 0.74±0.02  
  **A₂₈₀/A₂₆₀:** 0.38±0.02  
  **A₂₉₀/A₂₆₀:** 0.04±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.

<table>
<thead>
<tr>
<th>Catalog number</th>
<th>Pack size</th>
<th>Unit of measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 631 145 103</td>
<td>20 mL</td>
<td>μmol</td>
</tr>
<tr>
<td>11 889 532 103</td>
<td>100 mL</td>
<td>μmol</td>
</tr>
</tbody>
</table>

---

**Catalog number** 04 631 137 103: Will be supplied as “dTTP PCR Grade, Sodium Solution, 20 mL”.

**Catalog number** 11 889 559 103: Will be supplied as “dTTP Na, Solution (PCR Grade)”.

**Catalog number** 04 631 145 103: Will be supplied as “dUTP PCR Grade, Sodium Solution, 20 mL”.

**Catalog number** 11 889 532 103: Will be supplied as “ddUTP, Na, Solution (PCR Grade)”.

For further processing only.
Molecular Diagnostics  Amplification

NucleoMix (dUTP), PCR Grade
sodium salt, 40 mM (10 mmol/L each dNTP)

GMP-manufactured NucleoMixes from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

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.

Product description
NucleoMix (dUTP), PGR Grade, is supplied in sealed and CO₂-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 \( \cdot \) 11.0 A₂₆₀ 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 (RNA, human dystrophin gene): Corresponds to specification
Stability: At –15 to –25°C within specification range for 35 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Catalog number  Pack size
03 186 075 103  100 mL
Will be supplied as “Nucleomix (10 mmol/L, with dUTP)”. Unit of measure is “mL”.
For further processing only.

NucleoMix (dTTP), PCR Grade
sodium salt, 40 mM (10 mmol/L each dNTP)

GMP-manufactured NucleoMixes from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

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. For further processing only.

Product description
NucleoMix (dTTP), PGR Grade, is supplied in sealed and CO₂-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 \( \cdot \) 10.7 A₂₆₀ 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 (RNA, human dystrophin and mouse β-actin genes): Corresponds to specification
Stability: At –15 to –25°C within specification range for 35 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

Catalog number  Pack size
03 186 083 103  100 mL
Will be supplied as “Nucleomix (10 mmol/L, with dTTP)”. Unit of measure is “mL”.
For further processing only.
**NucleoMix (dTTP), PCR Grade**

sodium salt, 100 mM (25 mmol/L each dNTP)

GMP-manufactured NucleoMixes from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**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.

**Product description**

NucleoMix (dTTP), PCR Grade, is supplied in sealed and CO₂-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⁻¹ 10.7 A₂₆₀ 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** (RNA, human dystrophin, and mouse β-actin gene): Corresponds to specification

**Stability**: At -15 to -25°C within specification range for 30 months.

**Quality**

Manufactured under GMP (Good Manufacturing Practice) regulations.

---

**NucleoMix (dUTP), PCR Grade**

sodium salt, 100 mM (25 mmol/L each dNTP)

GMP-manufactured NucleoMixes from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**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.

**Product description**

NucleoMix (dUTP), PCR Grade, is supplied in sealed and CO₂-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⁻¹ 11.0 A₂₆₀ 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** (RNA, human dystrophin gene): Corresponds to specification

**Stability**: At -15 to -25°C within specification range for 30 months.

**Quality**

Manufactured under GMP (Good Manufacturing Practice) regulations.
ATP, Molecular Diagnostic Grade

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**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.

**Product description**

ATP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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_{5}O_{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: 310–340 mmol/L
- **CTP (HPLC):** ≤ 0.5 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 42 months.

<table>
<thead>
<tr>
<th>Catalog number</th>
<th>Pack size</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 529 194 103</td>
<td>100 mL</td>
</tr>
<tr>
<td>11 983 946 103</td>
<td>500 mL</td>
</tr>
</tbody>
</table>
Molecular Diagnostics  
Amplification  
Nucleotides

GTP, Molecular Diagnostic Grade  
sodium salt, 325 mM

GMP-manufactured NucleoMixes from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

Application  
GTP, Molecular Diagnostic 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.

Product description  
GTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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: C₁₀H₁₆N₅O₁₄P₃  
Molecular weight: 523.2 D

Specification  
Appearance: Clear, colorless solution  
pH value: 8.1–8.5  
GTP (1 μmol: 13.7 A₂₆₀ units, pH 7.0): 100–110 mmol/L  
GTP (HPLC): ≤0.5 area%  
GDP (HPLC): ≤0.5 area%  
Functional transcription assay: Corresponds to specification  
DNases/RNases: Negative

Stability: At +15 to -25°C within specification range for 30 months.

Catalog number  
Pack size
06 529 216 103  
100 mL
11 983 962 103  
500 mL

06 529 216 103: Will be supplied as “GTP, Solution 325 mmol/L, SQ for Mol.Biol.”. Unit of measure is “mmol”.
11 983 962 103: Will be supplied as “GTP Mol Dia Grade, 325 mmol/L, 500 mL”. Unit of measure is “μmol”.
For further processing only.

UTP, Molecular Diagnostic Grade  
sodium salt, 325 mM

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

Application  
UTP, Molecular Diagnostic 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.

Product description  
UTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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: 83-39-8  
Properties  
Nomenclature: Uridine-5′-triphosphate  
Formula: C₉H₁₅N₂O₁₅P₃  
Molecular weight: 484.2 D

Specification  
Appearance: Clear, colorless solution  
pH value: 8.1–8.5  
UTP (1 μmol: 9.9 A₂₆₀ units, pH 7.0): 310–340 mmol/L  
UTP (HPLC): ≤0.5 area%  
UDP (HPLC): ≤0.5 area%  
Functional transcription assay: Corresponds to specification  
DNases/RNases: Negative

Stability: At +15 to -25°C within specification range for 42 months.

Catalog number  
Pack size
06 529 224 103  
100 mL
11 983 989 103  
500 mL

06 529 224 103: Will be supplied as “UTP Mol Dia Grade, 325 mmol/L, 100 mL”. Unit of measure is “μmol”.
11 983 989 103: Will be supplied as “UTP, Solution 325 mmol/L, SQ for Mol.Biol.”. Unit of measure is “mmol”.
For further processing only.
**ATP, Molecular Diagnostic Grade**
sodium salt, 100 mM

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions.

**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, or mRNA therapeutics.

**Benefits**
Use ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions, from small to large scales. Reduce efforts and risks by using GMP-manufactured ribonucleotides in development and manufacturing of mRNA therapeutics.

**Product description**
ATP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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.

**Properties**
**Nomenclature:** Adenosine-5' triphosphate  
**Formula:** C_{10}H_{16}N_{5}O_{13}P_{3}  
**Molecular weight:** 507.2 D

**Specification**
**Appearance:** Clear, colorless solution  
**pH value:** 8.1-8.5  
**ATP (A$_{260}$; PH 7.0 c = 15.0 [L x mmol$^{-1}$ x cm$^{-1}$]):** 100-110 mmol/L  
**ATP (HPLC):** ≥98 area%  
**ADP (HPLC):** ≤1.5 area%  
**AMP (HPLC):** ≤0.5 area%  
**Qualification for molecular biology:** Corresponds to specification  
**DNases/RNases:** Negative  
**Nicking activity:** Negative  
**Functional transcription assay:** Corresponds to specification  
**Stability:** At −15 to −25°C within specification range for 30 months.

**Catalog number** 04 980 824 103  
**Pack size** 100 mL

Will be supplied as "ATP Mol Dia Grade, 100 mmol/L, 100 mL". Unit of measure is "mL". For further processing only.

---

**CTP, Molecular Diagnostic Grade**
sodium salt, 100 mM

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**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, or mRNA therapeutics.

**Benefits**
Use ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions, from small to large scales. Reduce efforts and risks by using GMP-manufactured ribonucleotides in development and manufacturing of mRNA therapeutics.

**Product description**
CTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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.

**Properties**
**Nomenclature:** Cytidine-5' triphosphate  
**Formula:** C$_9$H$_{16}$N$_3$O$_{14}$P$_3$  
**Molecular weight:** 483.2 D

**Specification**
**Appearance:** Clear, colorless solution  
**pH value:** 8.1-8.5  
**CTP (A$_{260}$; PH 7.0 c = 7A [L x mmol$^{-1}$ x cm$^{-1}$]):** 100-110 mmol/L  
**CTP (HPLC):** ≥98 area%  
**CDP (HPLC):** ≤1.5 area%  
**CMP (HPLC):** ≤0.5 area%  
**Qualification for molecular biology:** Corresponds to specification  
**DNases/RNases:** Negative  
**Nicking activity:** Negative  
**Functional transcription assay:** Corresponds to specification  
**Stability:** At −15 to −25°C within specification range for 30 months.

**Catalog number** 04 980 875 103  
**Pack size** 100 mL

Will be supplied as "CTP Mol Dia Grade, 100 mmol/L, 100 mL". Unit of measure is "mL". For further processing only.
Molecular Diagnostics  Amplification  Nucleotides

**GTP, Molecular Diagnostic Grade**
sodium salt, 100 mM

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in amplification reactions.

**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, or mRNA therapeutics.

**Benefits**
Use ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions, from small to large scales. Reduce efforts and risks by using GMP-manufactured ribonucleotides in development and manufacturing of mRNA therapeutics.

**Product description**
GTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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.

**Properties**
**Nomenclature:** Guanosine-5’-triphosphate  
**Formula:** C₁₀H₁₆N₅O₁₄P₃  
**Molecular weight:** 523.2 D

**Specification**
**Appearance:** Clear, colorless solution  
**pH value:** 8.1–8.5  
**GTP (A₂₆₀; pH 7.0) ε = 13.7 [L x mmol⁻¹ x cm⁻¹]: 100–110 mmol/L**  
**GTP (HPLC): ≥98 area%**

**UDP (HPLC): ≤1.5 area%**

**GMP (HPLC): ≤0.5 area%**

**Qualification for molecular biology:** Corresponds to specification  
**DNases/RNases:** Negative  
**Nicking activity:** Negative  
**Functional transcription assay:** Corresponds to specification  
**Stability:** At -15 to -25°C within specification range for 30 months.

**Catalog number** 04 980 859 103  
**Pack size** 100 mL

Will be supplied as GTP Mol Dia Grade, 100 mmol/L, 100 ml.  
Unit of measure is “mL.”  
For further processing only.

---

**UTP, Molecular Diagnostic Grade**
sodium salt, 100 mM

GMP-manufactured ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions.

**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, or mRNA therapeutics.

**Benefits**
Use ribonucleotides from the leading manufacturer of nucleotides for outstanding, consistent performance in transcription reactions, from small to large scales. Reduce efforts and risks by using GMP-manufactured ribonucleotides in development and manufacturing of mRNA therapeutics.

**Product description**
UTP, Molecular Diagnostic Grade, is supplied in sealed and CO₂-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.

**Properties**
**Nomenclature:** Uridine-5’-triphosphate  
**Formula:** C₉H₁₅N₂O₁₅P₃  
**Molecular weight:** 484.2 D

**Specification**
**Appearance:** Clear, colorless solution  
**pH value:** 8.1–8.5  
**UTP (A₂₅₀; pH 7.0) ε = 9.9 [L x mmol⁻¹ x cm⁻¹]: 100–110 mmol/L**  
**UTP (HPLC): ≥98 area%**

**UDP (HPLC): ≤1.5 area%**

**UMP (HPLC): ≤0.5 area%**

**Qualification for molecular biology:** Corresponds to specification  
**DNases/RNases:** Negative  
**Nicking activity:** Negative  
**Functional transcription assay:** Corresponds to specification  
**Stability:** At -15 to -25°C within specification range for 30 months.

**Catalog number** 04 979 018 103  
**Pack size** 100 mL

Will be supplied as UTP Mol Dia Grade, 100 mmol/L, 100 ml.  
Unit of measure is “mL.”  
For further processing only.
**MgCl₂ Stock Solution**

25 mM

Stock Solution for the preparation of optimized PCR reaction mixes or master mixes.

**Application**
Use this MgCl₂ Stock Solution in combination with any PCR buffer without MgCl₂ to optimize the magnesium concentration.

**Specification**

- **Appearance**: Clear, colorless solution
- **Contents**: MgCl₂, 25 mmol/L; pH approximately 8.3 at +20°C
- **Unspecific endonucleases (ADNA)**: 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 +65°C
- **Function test in PCR** (0.01 ng ADNA, 0.5 kb lambda fragment): Corresponds to specification

**Stability**: At –15 to –25°C within specification range for 24 months.

---

**MgCl₂ Solution**

1.0 M Solution

Highly concentrated stock solution for the preparation of optimized PCR reaction mixes or master mixes.

**Application**
Magnesium chloride influences the specificity and sensitivity of amplification reactions. This concentrated MgCl₂ solution is a stock solution for the preparation of kits routinely used in molecular biology and molecular diagnostics.

**Benefits**
- **Manufacture kits with consistent high performance.**
  - Benefit from a magnesium chloride concentration precisely adjusted with a maximum lot-to-lot variation of ±1%.
  - This solution’s ≤5 ppm heavy metal content ensures high level polymerase activity in your kits by avoiding inhibitory interactions.
- **Avoid false positive and false negative results.**
  - This product is thoroughly tested for the absence of DNase, RNase, protease and nicking activities. Dispensing into sterilized vials is done using 0.2 μm membrane filtration to avoid microorganism contamination.
- **Reduce supplier complexity.**
  - Buy polymerases, nucleotides, as well as the necessary top quality additives to consistently manufacture high performing kits.

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**RNase Inhibitor, recombinant, GMP Grade**

from rat lung, expressed in *E. coli*, solution

RNase Inhibitor, recombinant, GMP Grade, is useful in any application where protection from RNA degradation by RNases is critical.

**Application**
Use RNase Inhibitor, recombinant, GMP Grade, to protect RNA from unwanted degradation in diagnostic and therapeutic applications:
- *in vitro* transcription to generate mRNA therapeutics
- cDNA synthesis reactions
- protection of RNA during RNA isolation

**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.

---
**T4 Gene 32 Protein, recombinant**

recombinant from T4 phage, expressed in E. coli, solution

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

**Catalog number**

66 793 262 103

**Pack size**

custom fill

Will be supplied as "T4 Gene 32 Protein, rec.".

Unit of measure is "mg".

For further processing only.

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**Properties**

- **Molecular weight:** 35 kD
- **pH optimum:** About 8.0
- **Isoelectric point:** pH 5.5
- **Inactivation:** After 20 minutes heat denaturation at +85°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; pH approximately 8.2 at +25°C
- **Protein:** 10.5±0.5 mg/mL
- **Purity (SDS Page):** ≥95%

- **ssDNA binding** (shift in gelelectrophoresis, >90% at 20 μg protein and 1 μg DNA): 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.
- **Ribonucleases** (MS2 RNA): Not detectable in up to 50 μg after 1 hour incubation at +37°C.
- **Single-strand specific exonucleases** (M13mp9 ssDNA): Not detectable in up to 50 μg after 4 hours incubation at +37°C.
- **Absence of contaminating nucleic acids** (LightCycler® UniTOOL Resolight assay for detection of bacterial and fungal DNA): >1.0 genome equivalent/3 μg
- (LightCycler® PCR assay for detection of human β-Globin gene): <1 gene copy/50 μg

**Performance test** (LightCycler®): Corresponds to reference

**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*

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.

**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 at +4°C

**pH value:** 8.0 ± 0.1

**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 (M1 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.

**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.
Molecular Diagnostics Amplification Additional Products

Water, PCR Grade
Specially purified, double-distilled, deionized, and autoclaved water.

Application
Use Water, PCR Grade, for the preparation of solutions used in molecular diagnostics or molecular biology.

CAS: 7732-18-5

Specification
Appearance: Clear, colorless solution
Bioburden: ≤0.1 CFU/mL
TOC: ≤500 ppb
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.

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.

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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 complimentary 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 32P-labeled nucleotides
• Fill-in reaction for blunt-end formation of 3’-recessed (staggered) ends

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 complimentary 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: ≥2000 U/mL
Specific activity: ≥5000 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).
Nicking activity (pBR322 DNA): Not detectable in up to 50 U after 16 hours incubation at +37°C.
Purity (SDS gel electrophoresis, using up to 50 U enzyme): ≥90%
Protein: ≤0.4 mg/mL
Function test using Random Primed DNA Labeling Kit (>50% incorporation radioactive nucleotides after 30 minutes): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

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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 radioactively labeled nucleotides or nucleotides labeled with haptens, e.g., digoxigenin or biotin.

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 Co²⁺.

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%; glycerol, 50% (v/v); pH approximately 7.2 at +4°C
Volume activity (Co²⁺): ≥400x10³ U/mL
Specific activity (Co²⁺): ≥200x10³ 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; Co²⁺, 1 mmol/L) using d(pT)₆ as primer.
Unspecific endonucleases (MMW 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.
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.
**Biotin-16-dUTP**

1 mM solution

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

**Properties**

**Nomenclature:** Biotin-16-2'-deoxy-uridine-5'-triphosphate

**Formula:** C_{32}H_{48}N_{7}O_{18}P_{3}Li_{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):** 85.0-100.0 area%

**Function test using Biotin-High Prime:** ≤0.3 pg

**Stability:** At -15 to -25°C within specification range for 24 months.

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**Fluorescein-12-dUTP**

1 mM solution

Enzymatic nonradioactive labeling reagent for cDNA synthesis, PCR, random primed labeling, nick-translation or primer extension.

**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.

**CAS:** 134344-32-4

**Properties**

**Nomenclature:** Fluorescein-12-deoxyuridine-5'-triphosphate

**Formula:** C_{39}H_{37}N_{4}O_{21}P_{3}Li_{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):** 85.0-100.0 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. 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 nucleoside is a substrate for:
- Terminal Transferase
- DNA polymerase I (holoenzyme and Klenow fragment)
- Taq DNA polymerase
- Taq DNA polymerase
- Reverse transcriptase (e.g., Transcripter Reverse Transcriptase and other reverse transcriptases)

**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 situ hybridization for direct fluorescence detection. Multiple fluorescence labeling using Fluorescin-12-dUTP (yellow fluorescence) or other dye-labeled deoxynucleotides is possible.

**Properties**
- **Formula:** C_{37}H_{36}N_{5}O_{18}P_{3}Li_{4}
- **Molecular weight:** 959.4 D

**Specification**
- **Appearance:** Clear, red solution
- **Tetramethylrhodamine-5-dUTP** (1 μmol ≥ 70.0 A_{260} 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. Store dry. Protect from light.

---

COT Human DNA, CGH Grade
from human male placenta DNA, enriched for repetitive sequences, solution

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.

**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.

**Properties**
- **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
  - **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.

**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.

**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

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Will be supplied as “DNA, Cot-1, human”. Unit of measure is “mg”. For further processing only.

**Specification**

<table>
<thead>
<tr>
<th>Appearance: Clear, colorless solution</th>
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<tr>
<td>COT Human DNA (A₂₆₀/water): 1.0–2.0 mg/mL</td>
</tr>
<tr>
<td>Y-Chromosom (recovered exclusively from male human placenta): Correspondest to specification</td>
</tr>
<tr>
<td>Absence of HIV 1/2 and HCV/HBV: Corresponds to specification</td>
</tr>
<tr>
<td>Performance test using gel electrophoretic separation (4% agarose gel, without RE cleavage): middle chain length: 50–300 bp</td>
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<tr>
<td>Comparable intensity of Cot 1 DNA (2 μg and 3 μg) to masterlot (agarose gel electrophoresis after ethylbromide staining): Corresponds to specification</td>
</tr>
<tr>
<td>Stability: At -15 to -25°C within specification range for 18 months.</td>
</tr>
</tbody>
</table>

**Quality**
The product is HIV tested.

**DNA**
from fish sperm, lyophilizate

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.

**Product description**
DNA is resuspended in sterile double-distilled water at the desired concentration and sheared to an average fragment length of 100 to 3,000 bp.

**CAS:** 9007-49-2

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Will be supplied as “DNA, Sodium Salt from fish sperm”. Unit of measure is “g”. For further processing only.

**Contents**
Powder, lyophilized sodium salt

**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.
Molecular Diagnostics Carrier and Competitor Nucleic Acids DNA

Poly[d(A-T)]

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 to slightly grey lyophilized
- **DNA content** (A_{260}; phosphate buffer, 0.1 mol/L; pH 7.0): ≥15 AB/mg lyophilized
- **DNA content** (based on P_{(260nm)}): ≥70%
- P_{(260nm)}: ≥3 μg/mg lyophilized
- Na (flame photometric): ≤8.2%
- Protein (Lowry): ≤50 μg/mg lyophilized
- **Stability**: At +2 to +8°C within specification range for 12 months.

**Catalog number** 11 336 312 103

50 OD[260] units

Will be supplied as “Poly[d(A-T)], Sodium Salt”.
Unit of measure is “piece”.
For further processing only.

Molecular Diagnostics Carrier and Competitor Nucleic Acids RNA

RNA from yeast, powder, free acid

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_{(260nm)}: ≤3 μg/mg lyophilizate
- 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.

**Catalog number** 10 193 320 103

custom fill

Will be supplied as “RNA from Yeast”.
Unit of measure is “g”.
For further processing only.
### Molecular Diagnostics  
**Carrier and Competitor Nucleic Acids**

#### RNA

**Poly(A)**  
Potassium salt, solution

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
- **Mean strand length** (gel electrophoresis): 3000–10000 nucleotides
- **Ribonucleases** (Fluorescence polarisation): Negative

- **A<sub>260</sub>/A<sub>280</sub>**: 0.86–0.90
- **A<sub>260</sub>/A<sub>290</sub>**: 0.03–0.05

**Stability:** At -15 to -25°C within specification range for 36 months.

---

**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.

**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.
- **Ribonucleases** (MS2 RNA): Not detectable in up to 200 μg after 4 hours incubation at +37°C.
- **Proteases:** 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 glycogen.

**Stability:** At -15 to -25°C within specification range for 36 months.
## Molecular Diagnostics Additional Reagents

### Enzymes

### Alkaline Phosphatase, recombinant, 20 U/μL

- **Application**
  - 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

- **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:** Zn²⁺
  - **Activators:** Mg²⁺, Mn²⁺, Co²⁺
  - **Inactivation:** Complete inactivation after 5 minutes at +75°C.

### Specification

- **Appearance:** Clear, colorless solution
- **Storage buffer:** Tris/HCl, 25 mmol/L; MgCl₂, 1 mmol/L; ZnCl₂, 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
- **Unspecific endonucleases (5’ DNA):** Not detectable in up to 100 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.
- **Animal-derived additives:** None
- **Stability:** At -15 to -25°C within specification range for 24 months.

### T4 DNA Ligase

- **Application**
  - Use T4 DNA Ligase for ligation of DNA fragments.

- **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; MgCl₂, 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:** Mg²⁺
  - **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 [32P] from pyrophosphate into Norit-adsorbable 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.
- **Animal-derived additives:** None
- **Stability:** At -15 to -25°C within specification range for 18 months.

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**For more information please visit custombiotech.roche.com**
**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.

**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 (A280, 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.

Ribonucleases (MS2 RNA): Not detectable in up to 1 mg/mL after 2 hours incubation at +37°C.

Proteinases (colorimetric): Not detectable in up to 0.75 mg/mL after 2 hours incubation at +37°C.

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.

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**Catalog number** | Pack size
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10 715 858 103 | custom fill

Will be supplied as “Albumin (BSA) SQ for Molecular Biology”. Unit of measure is “g”. For further processing only.

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- ACTITAQ
- AMPLITAQ
- AMPLITAQ
- AMPITATIQ
- EAGLETAQ
- EXPAND
- FASTSTART
- HAWKZ0
- HYBPROBE
- LIGHTCYCLER
- NXTSCRIPT
- NUCLEOMIX
- RESOLIGHT
- UNITOOL

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# Product Index

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<td>AcI Taq &amp; exo Genotyping Master</td>
</tr>
<tr>
<td>Alkaline Phosphatase, recombinant, 20 U/μl</td>
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<tr>
<td>AptaTaq &amp; exo DNA Polymerase, 5 U/μl</td>
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<td>AptaTaq &amp; exo DNA Polymerase, 50 U/μl</td>
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<td>AptaTaq DNA Polymerase, 50 U/μl</td>
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<tr>
<td>AptaTaq Fast PCR Buffer</td>
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<tr>
<td>AptaTaq Genotyping Master (Rot)</td>
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<td>AptaTaq Genotyping Master</td>
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<tr>
<td>ATP, Molecular Diagnostic Grade, 325 μM</td>
</tr>
<tr>
<td>ATP, Molecular Diagnostic Grade, 100 μM</td>
</tr>
<tr>
<td><strong>B</strong></td>
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<tr>
<td>Biotin-16-dUTP</td>
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<tr>
<td>Bovine Serum Albumin, Molecular Biology Grade</td>
</tr>
<tr>
<td><strong>C</strong></td>
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<tr>
<td>COT Human DNA, CGH Grade</td>
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<tr>
<td>COT Human DNA</td>
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<tr>
<td>CTP, Molecular Diagnostic Grade, 325 μM</td>
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<td>CTP, Molecular Diagnostic Grade, 100 μM</td>
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<tr>
<td><strong>D</strong></td>
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<tr>
<td>dATP, PCR Grade</td>
</tr>
<tr>
<td>dCTP, PCR Grade</td>
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<tr>
<td>dGTP, PCR Grade</td>
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<tr>
<td>dTTP, PCR Grade</td>
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<tr>
<td>dNase I, recombinant, Grade I</td>
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<tr>
<td>dNase I, recombinant, dNase-free</td>
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<tr>
<td>dNase I, recombinant, RNase-free, GMP Grade</td>
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<tr>
<td>DNA</td>
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<td>dUTP, PCR Grade</td>
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<td>Evuscript RNA Master</td>
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<td><strong>F</strong></td>
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<tr>
<td>FastStart Taq DNA Polymerase</td>
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<td>FastStart Taq DNA Polymerase, 100 U/μl</td>
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<td>FastStart Taq DNA Polymerase, 5 U/μl</td>
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<td>FastStart Taq DNA Polymerase, GMP Grade, 5 U/μl</td>
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<td>Fluorescein-12-dUTP</td>
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<tr>
<td>Guanidine Hydrochloride</td>
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<td><strong>H</strong></td>
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<td>HawkZ05 Fast One-Step RT-PCR Master (Rot)</td>
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<tr>
<td><strong>K</strong></td>
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<td>KAPA Express Extract</td>
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<td>KAPA Probe Force</td>
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<tr>
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<td>KAPA3G PCR Buffer</td>
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<td>KAPA3G Plant PCR Kit</td>
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<td>Klenow Enzyme, Labeling Grade</td>
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<td><strong>M</strong></td>
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<tr>
<td>M-MLV Reverse Transcriptase, GMP Grade</td>
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<tr>
<td>MgCl₂ Solution</td>
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<td>Min(GA)₂, Stock Solution</td>
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<tr>
<td>NucleoMix (dUTP), PCR Grade</td>
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<tr>
<td>NxtScript Reverse Transcriptase, conc.</td>
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<tr>
<td><strong>P</strong></td>
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<tr>
<td>Poly [d(A-T)]</td>
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<td>Poly(A)</td>
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<tbody>
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