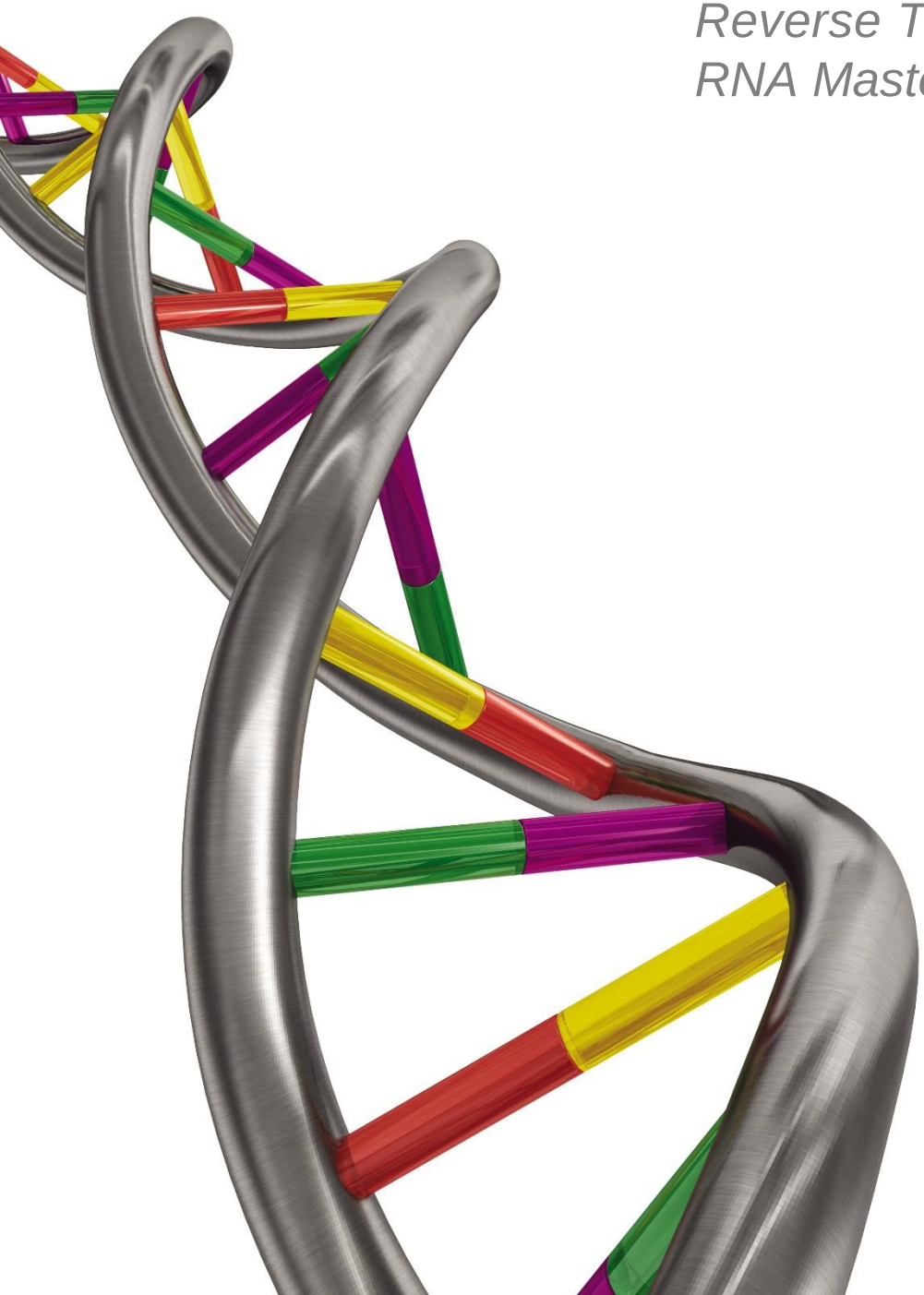
CustomBiotech Catalog
Molecular Diagnostics - *Amplification*

CUSTOMBIOTECH

Molecular Diagnostics, Amplification Products

DNA Polymerase
DNA Polymerase, HotStart
DNA Master
Reverse Transcriptase
RNA Master



Expand High Fidelity PCR System

Catalog number	Pack size
03 310 256 103	custom fill

Will be supplied as “Expand High Fidelity”. Unit of measure is “kU”. The enzyme is supplied without reaction buffer.

For further processing only.

For the best fit reaction buffer, use Expand High Fidelity PCR buffer, 10x conc., with MgCl2. See page 3.

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

Application

Use Expand High Fidelity PCR System for:

- Routine amplification of DNA fragments up to 5 kb from all DNA
- Amplification of DNA fragments up to 10 kb.
- Labeling of PCR products with modified nucleotides (e.g., DIG-dUTP, biotin-dUTP, fluorescein-dUTP)
- 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.

EC 2.7.7.7

Properties

Enzymes in Expand High Fidelity PCR System were originally isolated from the thermophilic eubacteria Thermus aquaticus (Taq) BM or Thermococcus gorgonarius (Tgo), both expressed in E. coli.

Enzyme acivities:

Taq Polymerase: Highly processive 5’-3’ DNA polymerase; double-strand-specific 5’-3’ exonuclease; no 3’-5’ exonuclease activity

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

pH optimum: Approximately 8.9 (+20°C)

Temperature optimum:

Fragment length <3 kb: Approximately +72°C

Fragment length >3 kb: Approximately +68°C

Substrates: Incorporates dNTP, dUPT, various labeled or modified nucleotides (200 µmol/L each is recommended of normal dNTP, increased concentrations of variants)

Divalent ion requirement: Mg^{2+} (1.5 mmol/L standard concentration)

Recommended usage per 50 µL reaction: 2.5 U (0.7 µL)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; KCl, 100 mmol/L; EDTA, 0.1 mmol/L; DTT, 1 mmol/L; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v); pH approximately 8.0 at +4°C
Volume activity: ≥3.5 kU/µL
RNases (MS2 RNA): Not detectable in up to 30 U after 1 hour incubation at +37°C.
Function test in PCR (200 ng human genomic DNA, 4.8 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand High Fidelity PCR Buffer

10x conc., with $MgCl_2$

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

Catalog number	Pack size
05 917 131 103	1 mL

Will be supplied as “Exp.HF Buffer 10x w MgCl2 MPB”. Unit of measure is “piece”.

DRY ICE

For further processing only.

Application

Use this buffer together with Expand High Fidelity PCR System.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/L; $(NH_4)_2SO_4$, 220 mmol/L; $MgCl_2$, 15 mmol/L; pH approximately 8.9 at +25°C
Unspecific endonucleases (λDNA and MWM II DNA): Not detectable in up to 20 µL after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µL after 16 hours incubation at +65°C.
Function test in PCR (human genomic DNA, 4.8 kb tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

Expand Long Template PCR System

Proofreading blend for accurate amplification of genomic DN A targets **up to 20 kb** using PCR.

Catalog number	Pack size
03 321 053 103	custom fill

Will be supplied as “Expand LT PCR Sys. Enzymmix, Bulk”. Unit of measure is “kU”.
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

Application

Use Expand Long Template PCR System for:

- Routine amplification of DNA fragments up to 20 kb from all DNA
- Amplification of DNA fragments up to 40 kb from λDNA
- Labeling of PCR products with modified nucleotides (e.g., DIG-dUTP, biotin-dUTP, fluorescein-dUTP)

- Combination with dUTP and Uracil-DNA Glycosylase for prevention of carryover contamination between PCR reactions
- Manufacture of amplification mixtures for regulated applications (e.g.,in vitro diagnostics, quality control), including validation

Benefits

- **Amplify 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 acivities:
Taq Polymerase: Highly processive 5'-3' DNA polymerase, double-strand specific 5'-3' exonuclease, no 3'-5' exonuclease activity
Tgo Polymerase: Highly processive 5'-3' DNA polymerase, double-strand specific 3'-5' exonuclease (also known as proofreading activity), no 5'-3' exonuclease activity
Temperature optimum:
Fragment length <3 kb: Approximately +72°C
Fragment length >3 kb: Approximately +68°C
Substrates: Incorporates dNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+} (1.75 mmol/L when using 350 µmol/L of each dNTP; 2.75 mmol/L when using 500 µmol/L of each dNTP)
Recommended usage per 50 µL reaction: 0.5-5.0 U (3.75 U standard concentration)

Specification

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: ≥5 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.

Taq DNA Polymerase, 5 U/µl

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

Catalog number	Pack size
11 147 633 103	custom fill

Will be supplied as “Taq DNA Polymerase”. Unit of measure is “kU”. The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

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

Application

Use Taq DNA Polymerase, 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.,invitro diagnostics, quality control)

EC 2.7.7.7

Properties

Taq DNA Polymerase is the recombinant full-length version of the thermostable enzyme from the eubacterium Thermus aquaticus BM, expressed in E. coli.
Enzyme acivities: Highly processive 5’-3’ DNA polymerase; double-strand specific 5’-3’ exonuclease; no 3’-5’ exonuclease activity
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Substrates: Incorporates dNTP, dUPT, dITP, various labeled or modified nucleotides (200 µmol/L each is recommended of normal dNTP, increased concentrations of variants)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; KCl, 100 mmol/L; DTT, 1 mmol/L; EDTA, 0.1 mmol/L; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); glycerol, 50% (v/v), pH approximately 8.0 at +4°C
Volume activity: ≥5 U/µL
Unit definition: One unit Taq DNA polymerase is defined as the amount of enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Function test in PCR using conventional blockcycler (10 pg λDNA, 0.5 kb fragment): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

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	Pack size
04 827 007 103	custom fill

Will be supplied as “Taq DNA Pol., Glycerol-free”. Unit of measure is “kU”.
The enzyme is supplied without reaction buffer.

For further processing only.

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, 5 U/ul**

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, 5 U/µl**

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; KCl, 100 mmol/L; DTT, 1 mmol/L; EDTA, 0.1 mmol/L; Nonidet P40, 0.5% (v/v); Tween 20, 0.5% (v/v); pH approximately 8.0 at +4°C
Glycerol content: ≤0.1% (v/v)
Volume activity: 55±5 U/µL
Unit definition: One unit Taq DNA Polymerase is defined as the amount of enzyme that incorporates 10 nmol of total deoxyribonucleosidetriphosphates into acid precipitable DNA within 30 minutes at +75°C under standard assay conditions.
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Function test in qPCR using LightCycler® 480 System (≥3 ng of human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

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.

Catalog number	Pack size
05 457 882 103	custom fill

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

DRY ICE

For further processing only.

For the best processivity reaction, use Aptataq Fast PCR buffer , 5x conc. See page 19.

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.

Product description

AptaTaq DNA Polymerase is a blend of Taq DNA Polymerase and a specific **oligonucleotide (aptamer) providing hot start features**.

EC 2.7.7.7

Properties

AptaTaq DNA Polymerase is reversibly inhibited below +55°C and becomes active at temperatures over +60°C. This hot start feature eliminates the risk of nonspecific primer extension during PCR setup.
Enzyme acivities: Highly processive 5'-3' DNA polymerase; double-strand-specific 5'-3' exonuclease; no 3'-5' exonuclease activity
pH optimum: Approximately 9.0 (+20°C)
Activation temperature: Active at ≥+60°C
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes

Substrates: Incorporates dNTP and various labeled or modified nucleotides (200 µmol/L each is recommended of normal dNTP, increased concentrations of variants).
Divalent ion requirement: Mg^{2+} (1.5 mmol/L standard concentration)

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; 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, 50.0% (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 (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background information

The aptamer/polymerase mixture is a hot start system with reversible inhibition of the polymerase activity at lower temperatures. Polymerase inactivation is achieved by a tight bond of the folded aptamer-oligonucleotide to the active site of the polymerase at lower temperatures. Upon heating above +60°C, the aptamer acts like a molecular switch, changing its temperature-dependent tertiary structure and releasing the active polymerase. Dropping the temperature below +55°C shuts off the polymerase activity again. Similar to antibody-based methods, the enzyme is much more quickly activated by heating, than chemically modified polymerases. In contrast to antibodies, the aptamer-oligonucleotide is much more stable, allowing longer storage at room temperature.

AptaTaq DNA Polymerase, 50 U/µl

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

Reversible hot start Taq DNA Polymerase without initial activation step for maximum stability combined with sensitivity and specificity; **lyo ready formulation** for preparation of dried amplification mixes.

Catalog number	Pack size
05 187 605 103	custom fill

Will be supplied as “AptaTaq DNA Polymerase, Glyc.-free, 50 U/uL”. Unit of measure is “kU”.

For further processing only.

Application

Apply AptaTaq DNA Polymerase for:

- Fast PCR assays with no extra enzyme activation time and fast cycling protocols
- Single- or multiplex PCR and qPCR applications requiring high specificity, sensitivity, and yield
- RT-PCR
- Difficult templates with secondary structures or GC-rich sequences
- Formulation of dried-down amplification reagents

Benefits

- **Reduce time to result.**
  Save up to 15 minutes per run by omitting the initial activation step required by chemically modified hot start polymerases, and reduce cycling time with fast protocols.
- **Maximize specificity, sensitivity, and yield.**
  Achieve reliable amplification of your target DNA from various sources (e.g., genomic DNA, cDNA, plasmids).
- **Simplify PCR setup.**
  Store these highly stable polymerase for up to 1 month at +2° to +8°C and setup your hot start PCR reaction at room temperature.
- **Obtain consistent results.**
  Roche standardized manufacturing processes include extensive Quality Control release testing for high lot-to-lot consistency ideal for (IVD) kit manufacturers and end users.
- **Prepare stable amplification mixes in dry format.**
  Use this formulation for producing dried-down amplification mixes stable at room temperature.

Product description

AptaTaq DNA Polymerase is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) providing hot start features. The concentrated formulation does not contain glycerol and is suitable for the preparation of dry amplification mix preparations.

EC 2.7.7.7

Properties

Active at temperature above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly processive 5'-3' DNA Polymerase that lacks 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. The inherent stability of Taq DNA Polymerase is shown by the high storage stability in refrigerator and freezer (24 months at +2 to +8°C and -25 to -25°C). Taq DNA Polymerase accepts dNTP analogs as substrates.

pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/L)
dNTP requirement: Approximately 200 µmol/L for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; 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); pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µL
Glycerol content: ≤0.1% (v/v)
Aptamer concentration (HPLC): 35.75 µmol/L ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 24 months.

Background information

See ***AptaTaq DNA Polymerase, 5 U/µl***

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.**

Catalog number	Pack size
05 884 314 103	custom fill

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

DRY ICE

For further processing only.

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.
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/L)
dNTP requirement: Approximately 200 µmol/L for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; 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: 5.5±0.5 U/µL
Aptamer concentration (HPLC): 3.58 µmol/L ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.

Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Tests for the absence of contaminating nucleic acids
(human genomic DNA, β-Globin fragment, ≤3 positve of 15 samples): Corresponds to specification
(LightCycler® UniTOOL ResoLight assay, detecting grampositive 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, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Quality

AptaTaq DNA Polymerase LDx quality contains a very low DNA background, verified using an ultra-sensitive LightCycler® assay for the absence of gram(+), gram(-) bacteria, and fungal DNA. To pass this Quality Control test, the level of contaminating nucleic acid must be <1 genome equivalent per 20 units of DNA polymerase. Furthermore, AptaTaq DNA Polymerase LDx is analyzed for the absence of contaminating human DNA using a LightCycler® test specific for β-globin.

Background information

Contaminating nucleic acids from various sources can affect PCR due to nonspecific amplification, leading to reduced sensitivity and specificity, and false positive results. To minimize the risk of contamination and provide a product with very low nucleic acid background, Roche developed a nucleic acid-free workflow with defined, consistent manufacturing processes and ultra-sensitive quality control methods:

- Our raw materials have reduced DNA content.
- All equipment, buffers, and solutions are decontaminated.
- Highly trained staff and dedicated rooms ensure clean production.
- Remaining traces of DNA contamination are removed using chromatography.
- The final product is extensively characterized and tested for the absence of contaminating DNA.

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

AptaTaq DNA Polymerase LDx, 50 U/µl

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

Reversible hot start Taq DNA Polymerase without initial activation step for maximum stability combined with sensitivity and specificity in **microbial testing**; **lyo ready formulation** for preparation of dried amplification mixes.

Catalog number	Pack size
05 447 895 103	custom fill

Will be supplied as “AptaTaq DNA Polymerase. LDx, Glyc.-free, 50 U/µL”. Unit of measure is “kU”.

For further processing only.

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-down amplification mixes stable at room temperature.
- **Enjoy the benefits of the advanced AptaTaq hot start system.** Refer to AptaTaq DNA Polymerase for additional benefits like speed, easy handling and consistent results.

Product description

AptaTaq DNA Polymerase LDx is a blend of Taq DNA Polymerase and a specific oligonucleotide (aptamer) with hot start features, optimized for applications detecting the lowest levels of DNA.

EC 2.7.7.7

Properties

AptaTaq DNA Polymerase LDx is active at temperature above +60 to +65°C and inactive below +55°C. This hot start feature eliminates the risk of nonspecific primer extension. Taq DNA Polymerase is a highly

processive 5'-3' DNA Polymerase lacking 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). This enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.
pH optimum: Approximately 9.0 (+20°C)
Temperature optimum for elongation: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 1.5 mmol/L)
dNTP requirement: Approximately 200 µmol/L for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; 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); pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µL
Glycerol content: ≤0.1% (v/v)
Aptamer concentration (HPLC): 35.75 µmol/L ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Tests for the presence of contaminating nucleic acids
(human genomic DNA, β-Globin fragment): Corresponds to specification
(LC UniTool Resolight assay, specific for grampositive and gramnegative bacterial DNA and fungi DNA, <1.0 copy genomic DNA/20 U enzyme): Corresponds to specification
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Quality

LDx quality contains a very low DNA background, as verified using an ultra-sensitive LightCycler® assay for the absence of gram(+), gram(-) bacteria, and fungal DNA. To pass this Quality Control test, the level of contaminating nucleic acid must be <1 genome equivalent per 20 units of DNA polymerase. Furthermore, it is analyzed for the absence of contaminating human DNA with a LightCycler® test, specific for β-globin.

Background information

For information on LDx refer to ***AptaTaq DNA Polymerase LDx, 5 U/µl***
For additional information on the AptaTaq hot start system, see ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Δ exo DNA Polymerase, 5 U/µl

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

Catalog number	Pack size
05 458 030 103	custom fill

Will be supplied as "AptaTaq Δ exo DNA Polymerase, 5 U/µL". Unit of measure is "kU".

DRY ICE

For further processing only.

N-terminal truncated Taq DNA Polymerase with reversible hot start system and **no 5'-3' exonuclease 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 Δexo 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 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 5'-3' and 3'-5' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.

pH optimum: Approximately 8.3 (+20°C)
Temperature optimum for elongation: Approximately +72°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 2 mmol/L)
dNTP requirement: Approximately 200 µmol/L for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; 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); casein, 0.1 g/L; pH approximately 8.0 at +4°C
Volume activity: 5.5±0.5 U/µL
Aptamer concentration (HPLC): 24.0 µmol/L ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 30 U after 4 hours incubation at +65°C.
Performance test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background information

See ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Δ exo 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' exonuclease activity** for optimal detection of mismatches; **lyo ready formulation** for preparation of dried amplification mixes.

Application

Use AptaTaq Δ exo 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 "AptaTaq Δ exo DNA Polymerase, Glyc.-free". Unit of measure is "kU".

For further processing only.

Benefits

- **Optimize your SNP analysis.**
  Discriminate between paired and unpaired primer ends using an enzyme optimized for allele-specific PCR.
- **Obtain reliable results fast.**
  Benefit from the general features of the AptaTaq DNA Polymerase System with the discriminating capabilities of a 5'-3' exonuclease activity-lacking Taq DNA Polymerase.
- **Prepare stable amplification mixes in dry format.**
  Use this formulation for producing dried-down amplification mixes stable at room temperature.

Product description

AptaTaq DNA Δ exo Polymerase is a blend of N-terminal truncated Taq DNA Polymerase and a specific oligonucleotide (aptamer) with hot start features, optimized for excellent discrimination against misextension. This concentrated formulation contains no glycerol and is suitable for the preparation of dried-down amplification mix preparations.

EC 2.7.7.7

Properties

AptaTaq Δ exoDNA 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' exonuclease activity. Taq DNA Polymerase is stable during prolonged incubations at elevated temperatures (+95°C). The enzyme exhibits highest activity at a pH of approximately 9 (adjusted at +20°C) and temperatures approximately +75°C. Taq DNA Polymerase accepts dNTP analogs as substrates.

pH optimum: Approximately 8.3 (+20°C)
Temperature optimum for elongation: Approximately +72°C
Half life at +95°C: Approximately 40 minutes
Divalent ion requirement: Mg^{2+} (standard concentration, 2 mmol/L)
dNTP requirement: Approximately 200 µmol/L for each dNTP

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; KCl, 100 mmol/L;EDTA, 0.1 mmol/L; DTT, 1 mmol/L; casein 1 g/L; glycerol-free; pH approximately 8.0 at +4°C
Volume activity: 55±5 U/µL
Aptamer concentration (HPLC): 240 µmol/L ±10%
Unspecific endonucleases (λDNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 30 U after 16 hours incubation at +37°C.
Function test in qPCR using LightCycler® 480 (≥0.03 ng human genomic DNA, 339 bp tPA fragment): Corresponds to reference
Stability: At -15 to -25°C within specification range for 12 months.

Background information

See ***AptaTaq DNA Polymerase, 5 U/µl***

AptaTaq Fast PCR Buffer

5x concentrated

5x concentrated PCR buffer for AptaTaq DNA Polymerase (without dNTPs and $MgCl_2$) for high specificity, sensitivity and yield for all single- or multiplex PCR and qPCR applications.

Catalog number	Pack size
07 708 963 103	custom fill

Will be supplied as “AptaTaq Fast PCR Buffer, 5x conc.”. Unit of measure is “mL”.

DRY ICE

For further processing only.

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

Appearance: clear, colorless solution
Function test qPCR on LC 480 II (Amplification of EPO Gr fragment using human genomic DNA): corresponds
Qualitative analysis of qPCR (Agarose gel electrophoresis: Amplification of 195 bp EPO Gr fragment using 1 ng human genomic DNA): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

EagleTaq DNA Polymerase, 5 U/µL

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

Catalog number	Pack size
05 206 944 190	1 kU
05 206 952 190	25 kU

05206944190: Will be supplied as ''CMPNT EAGLETAQ 1 KU, 5 U/uL 0.2 mL''. Unit of measure is ''piece''.
05206952190: Will be supplied as ''CMPNT EAGLETAQ 25 KU, 5 U/uL 5 mL''. Unit of measure is ''piece''.

For further processing only.

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

Application

Apply EagleTaq DNA Polymerase for:

- Hot start activated amplification
- Incorporation of modified nucleotides for generating labeled PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green

Benefits

- **Obtain high specificity, sensivity, 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

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 20 mmol/L; EDTA, 0.1 mmol/L; KCl, 100 mmol/L; DTT, 1 mmol/L; Tween 20, 0.5% (v/v); glycerol, 50.0% (v/v); pH approximately 9.0 at +20°C
Volume activity: 5.4-5.9 U/µL
Function test: At least $1.5x10^5$ fold amplification of λDNA after 25 cycles. One band at 500 bp on an agarose gel.
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

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

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

Catalog number	Pack size
04 659 163 103	5 kU

Will be supplied as “FastStart Taq DNA Pol. Ind. GMP Grd, 5KU”.
Unit of measure is “piece”.
The enzyme is supplied without reaction buffer.

For further processing only.

For the best fit reaction buffer, use FastStart PCR Buffer, 10x conc., with 20 mM $MgCl_2$, see page 24.
For the best fit reaction buffer, use FastStart PCR Buffer, 10x conc., without $MgCl_2$, see page 25.

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 consistncy of this product, thoroughly tested for a reproducible quality. Manufacturing and documentation are according to GMP (Good Manufacturing Practice) regulations.

EC 2.7.7.7

Properties

FastStart Taq DNA Polymerase is designed for hot start PCR and has to be heat-activated in the beginning of the reaction protocol.
Enzyme acivities: Highly processive 5’-3’ DNA polymerase; double-strand specific 5’-3’ exonuclease; no 3’-5’ exonuclease activity
Heat activation: +95°C for 3-10 minutes (assay-dependent; recommendation is 10 minutes for full activation)
pH optimum: Approximately 9.0 (+25°C)
Temperature optimum: Approximately +75°C
Half life at +95°C: Approximately 40 minutes
Substrates: Incorporates dNTP, dUPT, dITP, various labeled or modified nucleotides (200 µmol/L each is recommended of normal dNTP, increased concentrations of variants).
Divalent ion requirement: Mg^{2+} (1.5 mmol/L standard concentration)

Specification

Appearance: Clear 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 (λDNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Function test in PCR
(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.

Catalog number	Pack size
12 161 508 103	custom fill

Will be supplied as ''Fast Start Taq DNA Polymerase''. Unit of measure is ''kU''.
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

For the best fit reaction buffer, use FastStart PCR Buffer, 10x conc., with 20 mM $MgCl_2$, see page 24.
For the best fit reaction buffer, use FastStart PCR Buffer, 10x conc., without $MgCl_2$, see page 25.

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: ≥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 (λDNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 15 U after 4 hours incubation at +65°C.
Function test in PCR
(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

Catalog number	Pack size
04 433 785 103	custom fill

Will be supplied as "FastStart Taq DNA Pol. 100 U/µl". Unit of measure is "kU".
The enzyme is supplied without reaction buffer.

For further processing only.

Concentrated hotstart 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

For further 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, 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 (λDNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 25 U after 1 hour incubation at +37°C.
Exonucleases (^{3}H-DNA): Not detectable in up to 15 U after 4 hours incubation at +65°C.

Function test in PCR
(50 pg human genomic DNA, 365 bp tPA 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 $MgCl_2$

Standard reaction buffer for PCR using FastStart Taq DNA Polymerase.

Application

Use this buffer together with FastStart Taq DNA Polymerase. For applications refer to **FastStart Taq DNA Polymerase, 5 kU, GMP Grade.**

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 500 mmol/L; $(NH_4)_2SO_4$, 50 mmol/L; KCl, 100 mmol/L; $MgCl_2$, 20 mmol/L; pH approximately 8.3 at +25°C
Unspecific endonucleases (λDNA): Not detectable in up to 20 µL after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µL after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 20 µL after 1 hour incubation at +37°C.
Function test in PCR (50 pg human genomic DNA, 365 bp tPA fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Catalog number	Pack size
12 161 516 103	custom fill

Will be supplied as ''PCR buffer (10X) w MgCl2''. Unit of measure is ''mL''.

DRY ICE

For further processing only.

FastStart PCR Buffer

10x conc., without $MgCl_2$

Catalog number	Pack size
05 917 166 103	1 mL

Will be supplied as “PCR buffer (10X) w/o MgCl2”. Unit of measure is “piece”.

For further processing only.

Standard reaction buffer without $MgCl_2$ for optimization of the $MgCl_2$ concentration in PCR using FastStart Taq DNA Polymerase.

Application

Use this buffer together with FastStart Taq DNA Polymerase whenever the amplification of difficult target requires a specific $MgCl_2$ concentration.

Specification

Appearance: Clear, colorless solution

Contents: Tris/HCl, 500 mmol/L; $(NH_4)_2SO_4$, 50 mmol/L; KCl, 100 mmol/L; pH approximately 8.3 at +25°C

Unspecific endonucleases (λDNA, MWM II DNA): Not detectable in up to 20 µL after 16 hours incubation at +37°C.

Nicking activitiy (pBR322 DNA): Not detectable in up to 20 µL after 16 hours incubation at +37°C.

Ribonucleases (MS2 RNA): Not detectable in up to 20 µL after 1 hour incubation at +37°C.

Function test in PCR:

10 ng human genomic DNA, 4.8 kb tPA fragment/ 1.8 kb EPO fragment: Corresponds to specification

50 pg human genomic DNA, 365 bp tPA fragment: Corresponds to specification

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

HawkZ05 Fast DNA Polymerase, 40 U/µl

mutant from *Thermus species* Z05, recombinant in *E. coli*, solution

Catalog number	Pack size
07 731 264 103	custom fill
05 230 349 190	200KU

Reversible hot start DNA polymerase with high reverse transcriptase activity for **one-step RT-PCR**, allowing a **fast RT-step**.

Will be supplied as “HawkZ05 Fast DNA Polymerase, 40 U/µL”. Unit of measure is “kU”.

DRY ICE

For further processing only.

For best fit RT activity, use Mn(OAc)2 stock solution, 25mM, RT-PCR grade. See page 30.

Application

Apply HawkZ05 Fast DNA Polymerase for:

- Fast, high temperature cDNA synthesis and subsequent DNA amplification of RNA templates
- Multiplex PCR and qPCR applications that require high specificity, sensitivity, and yield
- Incorporation of modified nucleotides for labeling of PCR products
- Detection formats such as hydrolysis probes, hybridization probes and SYBR Green
- Fast-cycling diagnostic applications and other routine amplification of low-copy targets

Benefits

- **Be flexible**.
  Hawk Z05 Fast DNA Polymerase hot start system 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.
- **Achieve high sensitivity.**
  High fluorescence intensity results in lower Cp values and improves results for weakly positive samples.

Product description

HawkZ05 Fast DNA Polymerase is a blend of Z05 DNA Polymerase and a specific oligonucleotide (aptamer) providing the hot start feature.

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: Mg^{2+}
Divalent ion requirement for RT activity and RT-PCR: Mn^{2+}
Substrates: Incorporates dNTP, dUPT, 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: 53±13 U/µL
Aptamer concentration (HPLC): 38 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 exonucleases (MWM V DNA): Not detectable in 30 U enzyme after 1 hour incubation at +37°C.
Double-strand specific exonucleases (MWM V DNA): Not detectable in up to 30 U enzyme after 1 hour incubation at +74°C.
Stability: At -15 to -25°C within specification range for 12 months.

HawkZ05 Fast DNA Polymerase, 200 U/µl

mutant from *Thermus species* Z05, recombinant in *E. coli*, glycerol-free solution

Catalog number	Pack size
07 731 329 103	custom fill

Will be supplied as “HawkZ05 Fast DNA Pol, glyc-free, 200 U/µL”. Unit of measure is “kU”.

DRY ICE

For further processing only.

For best fit RT activity, use Mn(OAc)2 stock solution, 25mM, RT-PCR grade. See page 30.

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**.
  Hawk Z05 Fast DNA Polymerase hot start system 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.
- **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.

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: Mg^{2+}
Divalent ion requirement for RT activity and RT-PCR: Mn^{2+}
Substrates: Incorporates dNTP, dUPT, 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±65 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 exonucleases (MWM V DNA): Not detectable in up to 30 U enzyme after 1 hour incubation at +37°C.
Double-strand specific exonucleases (MWM V DNA): Not detectable in up to 30 U enzyme after 1 hour incubation at +74°C.
Stability: At -15 to -25°C within specification range for 12 months.

$Mn(OAc)_2$ Stock Solution

25 mM

RT-PCR Grade Manganese acetate solution.

Application

Use $Mn(OAc)_2$ 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 (λDNA and MWM II DNA): Not detectable in up to 20 µL after 16 hours incubation at +65°C.
Nicking activity (pBR322 DNA): Not detectable in up to 20 µL after 16 hours incubation at +65°C.
Function test (10 ng human liver RNA, 630 bp MCAD fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 12 months.

Catalog number	Pack size
05 187 109 103	1 mL

Will be supplied as "$Mn(OAc)_2$ Stock Solution, 25 mM". Unit of measure is "piece".

For further processing only.

KAPA2G HotStart DNA polymerase, 25 U/µl

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

Catalog number	Pack size
08 918 686 103	custom fill

Will be supplied as “KAPA2G HotStart DNA Polymerase”. Unit of measure is “ml”.

DRY ICE

For further processing only.

For best fit reaction buffer, use KAPA2G buffer A for high processivity or KAPA2G buffer B for increased inhibitor tolerance. See page 32.

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%.
- **Use the same protocol for difficult targets.**
  Work with GC- and AT-rich targets and shorten optimization time of your assays

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 consistent amplification across a broad range of amplicon type (GC- and AT-rich), eliminating the need for optimization using multiple enzymes and protocols. It enables robust PCR performance, high sensitivity and improved tolerance to common inhibitors such as NaCl, EtOH, SDS and Urea.

Specification

Volume activity: ≥ 25 U/µL
Unspecific endonucleases (plasmid DNA): Not detectable up to 10 U using pBR 322 DNA / 16 hours/ +37°C
Exonucleases: Not detectable up to 10 U using λ-DNA / 16 hours/+37°C
E.coli DNA : Average Ct value of no template control is ≥ 2.0 cycles later than the average Ct value of the 100 fg DNA standard

KAPA2G Buffer A

10x concentrated

Catalog number	Pack size
09 084 690 103	custom fill

Will be supplied as "KAPA2G Buffer A". Unit of measure is "ml".

DRY ICE

For further processing only.

Reaction buffer A to utilize the **high processivity** of KAPA2G Polymerase for fast protocol.

Application

Fast DNA amplification protocols with KAPA2G HotStart DNA Polymerase.

Benefits

- **Save valuable time.**
  Reach extension times as low as 1 sec/kb to significantly reduce PCR reaction time
- **Work with difficult templates.**
  Broad coverage of both AT- and GC-rich targets

Specification

Appearance: clear, colourless solution

Performance test: on LightCycler 480 II.

Amplification of an ActB fragment with Taqman Probe.

KAPA2G Buffer B

10x concentrated

Catalog number	Pack size
09 084 703 103	custom fill

Will be supplied as "KAPA2G Buffer B". Unit of measure is "ml".

DRY ICE

For further processing only.

Reaction buffer B to give KAPA2G increased **inhibitor toleranc e** and capacity to show equally high performance for different ta rgets with a broad range of GC-content.

Application

Robust, inhibitor-tolerant DNA amplification with KAPA2G HotStart DNA Polymerase.

Benefits

- **Easiliy work with crude samples.**
  High tolerance to inhibitor carryover and crude sample PCR (e.g. NaCl, Urea, SDS, Ethanol)
- **Achieve high sensitivity in challenging applications**
  Obtain increased performance across a wide range of GC- and AT-rich targets

Specification

Appearance: clear, colourless solution

Performance test: on LightCycler 480 II.

Amplification of an ActB fragment with Taqman Probe.

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

For applications, see **KAPA2G HotStart DNA polymerase, 25U/ul.**

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

See **KAPA2G HotStart DNA polymerase, 25U/ul.**

Specification

Volume activity: 5 U/µL
Unspecific endonucleases (plasmid DNA): Not detectable after 8 hours incubation at 37°C.
Exonucleases (λ DNA): 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 (≥ 1 ng DNA): Corresponds to specification

Catalog number	Pack size
08 041 202 001	5000 U

Will be supplied as “KAPA2G Fast HotStart PCR Kit”. Unit of measure is “piece”.

DRY ICE

For further processing only.

Contents

2 x 500 µL tube of 5 U/µL KAPA2G Fast HotStart
2 x 30 mL tube of 5x 2G Buffer A
2 x 10 mL tube of 25 mM $MgCl_2$

KAPA2G Robust HotStart PCR Kit

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

Catalog number	Pack size
08 041 121 001	5000 U

Will be supplied as "KAPA2G Robust HotStart PCR Kit". Unit of measure is "piece".

For further processing only.

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.

Contents

- 2 x 500 µL tube of 5 U/µL KAPA2G Robust HotStart
- 1 x 55 mL tube of 5x 2G A
- 1 x 55 mL tube of 5x 2G B
- 1 x 55 mL tube of 5x 2G GC Buffer
- 1 x 55 mL tube of 5x Enhancer 1
- 2 x 10 mL tube of 25 mM $MgCl_2$

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 an antibody-mediated hot start DNA polymerase and all buffers necessary to optimize the amplification reaction.

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 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 (λ DNA): 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 (≥ 1 ng DNA): Corresponds to specification

KAPA3G HotStart DNA polymerase, 30 U/µl

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

Catalog number	Pack size
08 918 651 103	custom Fill

Will be supplied as "KAPA3G HotStart DNA Polymerase, Glycerol-free, 30 U/µL". Unit of measure is "KU".

DRY ICE

For further processing only.

Third generation mutant of Taq polymerase evolved for exceptionally **high processivity** and **robustness, lyo ready formation** for preparation of dried amplification mixes

Application

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

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.
- **Lyophilization-ready**
  Create flexible assay designs that retain performance over long time periods

Product description

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

Properties

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.

Specification

Volume activity: ≥ 30 U/µL
Unspecific endonucleases (plasmid DNA): Not detectable up to 10 U using pBR 322 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 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 fo r maximum PCR inhibitor tolerance.

Catalog number	Pack size
08 041 091 001	1000 reactions

Will be supplied as “KAPA3G Plant PCR Kit”. Unit of measure is “piece”.

For further processing only.

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.

Product description

The kit contains hot start DNA polymerase, a reaction buffer including dNTP’s, 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 (λ DNA): 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 (≥ 0.4 ng DNA): Corresponds to specification

Contents

- 4 x 100 µL tube of 2.5 U/µL KAPA3G Plant HotStart
- 4 x 6.25 mL tube of 2x Plant PCR Buffer + dNTPs
- 2 x 1.6 mL tube of 25 mM $MgCl_2$

EagleTag DNA Master Mix

2x Concentrated

Catalog number	Pack size
05 529 085 190	50ml

Will be supplied as "KIT EAGLETAQ MMX 50 mL". Unit of measure is ' 'piece".

For further processing only.

Hot start DNA Master Mix for fast cycling PCR/qPCR at high sensitivity and specificity.

Application

- Gene expression analysis of cDNA
- Efficient amplification of rare cDNA and low copy DNA targets
- Fast thermal cycling for high-throughput real-time PCR applications

Benefits

- **Obtain high specificity, sensitivity, and yield.**
  Prevent the extension of non-specifically bound primers using this hot start enzyme
- **Obtain reliable result.**
  Use the gold standard of hot start polymerase for robust reaction performance.

Product description

- The EagleTaq DNA Master Mix is a ready-to-use, 2× concentrated PCR master mix that contains all the reagents (except primers, probes, and template) needed for performing quantitative, real-time PCR hydrolysis probe reactions.
- The EagleTaq DNA Master Mix contains dUTP so that it may be used with Uracil-DNA Glycosylase (UNG) to prevent false positives arising from carryover contamination.
- The hot start properties allow reaction setup at ambient temperature.
- With this robust reagent, any PCR protocol optimization is minimized

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 18 and 28 cycles with starting template of 10 pg λDNA. Average CT value of test is within ±2 cycles of proven.
Stability: At -15 to -25°C within specification range for 12 months.

EagleTag Universal Master Mix (ROX)

2x Concentrated

Hot start DNA Master Mix for fast cycling PCR/qPCR at high sensitivity and specificity, contains a ROX reference dye

Catalog number	Pack size
07 073 356 190	5ml
07 073 313 190	50ml

Will be supplied as "CMPNT EAGLETAQ UNIVERSAL MMX W/ ROX ". Unit of measure is "piece".

DRY ICE

For further processing only.

Application

- Gene expression analysis of cDNA
- Efficient amplification of rare cDNA and low copy DNA targets
- Fast thermal cycling for hgh-throughput real-time PCR applications

Benefits

- **Obtain high specificity, sensitivity, and yield.**
  Prevent the extension of non-specifically bound primers using this hot start enzyme
- **Obtain reliable result.**
  Use the gold standard of hot start polymerase for robust reaction performance.

Product description

- The EagleTaq Universal Master Mix (ROX) is a ready-to-use, 2× concentrated PCR master mix that contains all the reagents (except primers, probes, and template) needed for performing quantitative, real-time PCR hydrolysis probe reactions. It contains a special ROX reference dye which makes it suitable for all real-time instruments on which a ROX reference dye is needed for quantitative analysis.
- The EagleTaq Universal Master Mix (ROX) contains dUTP so that it may be used with Uracil-DNA Glycosylase (UNG) to prevent false positives arising from carryover contamination.
- The hot start properties allow reaction setup at ambient temperature.
- With this robust reagent, any PCR protocol optimization is minimized

Specification

Appearance: Clear, colorless solution
PCR Functional Assay: Average Ct value of Test Positive Controls is between 17 and 23 cycles with starting template of 10 pg Lambda DNA.
Stability: At -15 to -25°C within specification range for 12 months.

FastStart PCR Master

2x concentrated

Catalog number	Pack size
04 659 155 103	custom Fill

Will be supplied as “FastStart DNA Master, 2x conc., 5mL”. Unit of measure is “mL”.

For further processing only.

Hot start DNA master mix for PCR/qPCR at high sensitivity and specificity.

Application

Use this ready-to-use 2x hot start master mix containing FastStart Taq DNA polymerase for highly specific PCR amplifications.

Benefits

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

Product description

The FastStart Taq DNA Master is a 2x concentrated, hot start PCR master mix that contains all reagents (except primers, probes, and template) needed for real-time DNA detection assays with various probe formats.

2.7.7.7

Properties

The master mix can be stored in the refrigerator (+2 to +8°C) for at least 1 week without loss of activity and performance. It is stable at room temperature for at least one day.

Specification

Appearance: Clear colorless solution
Contamination activities:
Unspecific endonucleases: not detectable
Nicking activity: not detectable
Ribonucleases: not detectable
Performance test in qPCR using
Amplification tPA fragment: corresponds
Amplification of a 1.1 kb Collagen-fragment: corresponds
Stability: At -15 to -25°C within specification range for 12 months.

AptaTaq DNA Master

5x Concentrated

Catalog number	Pack size
05 537 533 103	custom Fill

Will be supplied as "AptaTaq DNA Master". Unit of measure is "ml"

For further processing only.

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

Application

Use the master mix to amplify targets efficiently with high specificity and sensitivity. The AptaTaq DNA Master is developed to match a broad range of applications. It is ideally suited for high-throughput applications with low reaction volume due to its 5x concentration and high stability at room temperature. In combination with appropriate dyes, it can be used on various instrument platforms for endpoint analysis and real-time PCR. Due to the use of dUTP, DNA carryover contamination can be prevented when adding Uracil-DNA Glycosylase (UNG).

Benefits

- **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.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.

Product description

AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix. It contains AptaTaq DNA Polymerase, reaction buffer including an optimized Mg^{2+} concentration, and a dNTP mix with dUTP instead of dTTP.

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 stab le at room temperature for at least 2 days.

Specification

Appearance: Clear, colorless solution
Performance test in qPCR using ABI 7500:
(human genomic DNA, CycA fragment): Corresponds to specification
(human genomic DNA, β-globin fragment): Corresponds to specification
(human genomic DNA, ApoE fragment): Corresponds to specification
Stability: At -15 to -25°C within specification range for 24 months.

AptaTaq Genotyping Master

5x concentrated

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

Catalog number	Pack size
05 955 807 103	10 mL

05955807103: Will be supplied as ''AptaTaq Genotyping Master, 10 mL". Unit of measure is ''piece''.

For further processing only.

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.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.

Product description

AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix, containing AptaTaq DNA Polymerase in an optimized concentration for the amplification of difficult sample types, reaction buffer, and a dNTP mix using dUTP instead of dTTP (for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase).

EC 2.7.7.7

Properties

The master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

Specification

Appearance: Clear, colorless solution
Performance test in qPCRusing ABI 7900 HT
(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**

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.

Catalog number	Pack size
05 955 823 103	10 mL
05 890 144 103	custom fill

05955823103: Will be supplied as ''AptaTaq Genotyping Master (ROX), 10 mL''. Unit of measure is ''piece''.
05890144103: Will be supplied as ''AptaTaq Genotyping Master (ROX)''. Unit of measure is ''mL''.

DRY ICE

For further processing only.

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.

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.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.

Product description

AptaTaq DNA Master is a 5x concentrated, ready-to-use, one component hot start PCR mix, containing AptaTaq DNA Polymerase in an optimized concentration for the amplification of difficult sample types, reaction buffer, and a dNTP mix with dUTP (for prevention of DNA contamination by PCR carryover by pretreatment with Uracil-DNA Glycosylase). The special Rox reference dye (FRET-ROX) enables you To run assays for all real-time PCR instruments in which Rox reference dye is required for quantitative analysis.

EC 2.7.7.7

Properties

The PCR master mix is very stable and can be stored in the refrigerator (+2 to +8°C) for at least 4 weeks without loss of activity and performance. It is stable at room temperature for at least 2 days.

Specification

Appearance: Clear, slightly violet solution
Performance test in qPCR using ABI 7900HT
(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**

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.

Catalog number	Pack size
07 368 143 103	5 mL

Will be supplied as “NxtScript DNA Master, 5x, 5 mL”. Unit of measure is “piece”.

DRY ICE

For further processing only.

Benefits

- **Save time.**
  Take advantage of the aptamer technology and run a fast PCR protocol.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.
- **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.

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

Catalog number	Pack size
08 041 172 001	12.5 mL

Will be supplied as “KAPA2G Fast HotStart Ready Mix”. Unit of measure is “piece”.

DRY ICE

For further processing only.

Contents

2 x 6.25 mL tube of 2x KAPA2G Fast HotStart ReadyMix

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 (λ DNA): 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 (≥ 1 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

Catalog number	Pack size
08 041 113 001	12.5 mL

Will be supplied as “KAPA2G Robust HotStart Ready Mix”. Unit of measure is “piece”.

DRY ICE

For further processing only.

Contents

2 x 6.25 mL tube of 2x KAPA2G Robust HotStart ReadyMix

- 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 carry-over 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.

Specification

Unspecific endonucleases (plasmid DNA): Not detectable after 8 hours incubation at 37°C.
Exonucleases (λ DNA): 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 (≥ 0.1 ng human genomic DNA): Corresponds to specification

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.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.
- **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.

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.

Catalog number	Pack size
08 041 237 001	10 mL
08 041 229 001	50 mL

Will be supplied as “KAPA PROBE FORCE qPCR Master Mix, 10 mL” - “KAPA PROBE FORCE qPCR Master Mix, 50 mL”. Unit of measure is “piece”.

For further processing only.

Contents

Cat. No. 08041237001 - 2 x 5 mL tube KAPA PROBE FORCE qPCR Master Mix
Cat. No. 08041229001 - 1 x 50 mL tube KAPA PROBE FORCE qPCR Master Mix

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

Antibody-mediated hot start master mix **for fast and inhibitor-resistant** PCR. Formulated without glycerol for the preparation of **dried amplification mixes**.

Catalog number	Pack size
09 084 711 103	custom Fill

Will be supplied as "KAPA3G HotStart Master". Unit of measure is "ml".

DRY ICE

For further processing only.

Application

10x 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.

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.
- **Save valuable time and costs.**
  Sample-to-result workflows in <1 hour.
- **Prevent carryover contamination**
  The mix is compatible with UNG protocol to prevent false positive.
- **Expand your options in assay development.**
  Use for multiplexing qPCR applications with hydrolysis probe assays on a broad range of platforms.

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.
Simply add primers, probe, and template to perform a PCR. MgCl2 and dNTPs including dUTP are included in the master mix.

- KAPA3G HotStart DNA Polymerase retains 5′→3′ exonuclease activity, enabling probe-based qPCR for both routine and challenging sample types.
- The glycerol-free formulation makes KAPA3G HotStart Master suitable for preparation of dried amplification mixes.
- Each lot of KAPA3G HotStart Master is function tested using the LightCycler® System for qPCR.

M-MLV Reverse Transcriptase, GMP Grade

from Moloney Murine Leukemia Virus, expressed in *E. coli*

Catalog number	Pack size
04 707 486 103	200 kU

Will be supplied as “M-MLV RT Industrial GMP Grade, 200 KU”. Unit of measure is “piece”.
The enzyme is supplied without reaction buffer.

DRY ICE

For further processing only.

M-MLV Reverse Transcriptase for preparation of full-length cDNA with high efficiency.

Application

Use M-MLV Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA for:

- Two-step RT-PCR applications for amplification from RNA targets
- RT-PCR for detection of viral RNA
- TMA and NASBA nucleic acid amplification methods
- Synthesis of full-length cDNA for libraries or cloning
- Rapid amplification of cDNA end (RACE)
- Manufacture of amplification mixtures for applications with regulatory requirements (e.g.,in vitro diagnostics, quality control)

EC 2.7.7.49

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, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Storage buffer: Tris/HCl, 25 mmol/L; NaCl, 100 mmol/L; DTT, 10 mmol/L; EDTA, 0.1 mmol/L; Triton X-100, 0.01% (v/v); glycerol, 50% (v/v); pH approximately 7.5
Volume activity: 200-300 U/µL
Specific activity: ≥100 kU/mg protein
Unit definition: One unit M-MLV Reverse Transcriptase, GMP Grade, is defined as the amount of enzyme which incorporates 1 nmol of [^{3}H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A) x$(dT)_{15}$ as substrate.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 100 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 100 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 200 U after 1 hour

incubation at +37°C.
Bioburden: ≤50 CFU/mL
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Quality
Manufactured under GMP (Good Manufacturing Practice) regulations.

NxtScript Reverse Transcriptase, Concentrate, 250U/ul
mutant from Moloney Murine Leukemia Virus, expressed in *E.coli*

Catalog number	Pack size
07 051 166 103	custom fill

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

DRY ICE

For further processing only.

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 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.

EC 2.7.7.49

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: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Activity: ≥250 U/µL
Unit definition: One unit NxtScript Reverse Transcriptase is defined as the amount of enzyme which incorporates 1nmol [^{3}H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x(dT_{15}) as substrate.
Purity (HPLC): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 75 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 150 U after 1 hour incubation at +37°C.
Stability: At -15 to -25°C wihtin specification range for 12 months.

NxtScript Reverse Transcriptase, 85 U/µl

mutant from Moloney Murine Leukemia Virus, expressed in *E.coli*

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

Catalog number	Pack size
07 371 527 103	80 µL

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

DRY ICE

For further processing only.

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, ddNTP, dUTP, and various labeled or modified nucleotides.
Divalent ion requirement: Mg^{2+}

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 wihtin specification range for 15 months.

Transcriptor Reverse Transcriptase, 20U/ul

recombinant, expressed in *E. coli*

Catalog number	Pack size
03 531 252 103	custom fill

Will be supplied as “Transcriptor Bulk”. Unit of measure is “kU”. The enzyme is supplied without reaction buffer.

For further processing only.

For the best fit reaction buffer, use Transcriptor RT Buffer, see page 54.

Transcriptor Reverse Transcriptase is the robust recombinant reverse transcriptase with thermostability up to +60°C, for transcription of RNA fragments up to 14 kb in two-step RT-PCR applications.

Application

Use Transcriptor Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA for:

- Two-step RT-PCR applications using conventional thermal cyclers or real-time PCR instruments
- RT-PCR for detection of viral RNA
- TMA and NASBA nucleic acid amplification methods
- Synthesis of full-length cDNA up to 14 kb for libraries or cloning
- Rapid amplification of cDNA end (RACE)

EC 2.7.7.49

Properties

Transcriptor Reverse Transcriptase offers higher thermostability compared to the native forms of AMV or M-MLV reverse transcriptase, allowing higher temperatures for reverse transcription, achieving high performance with GC-rich RNA fragments and difficult secondary structures.

Enzyme activities: RNA-dependent DNA polymerase, DNA-dependent DNA polymerase, unwinding activity, RNase H (degrading RNA in RNA:DNA hybrids)
Recommended reaction temperature: +42 to +65°C
Substrates: Incorporates dNTP, ddNTP, dUPT, various labeled or modified nucleotides
Divalent ion requirement: Mg^{2+}

Specification

Appearance: Clear, colorless solution
Storage buffer: Potassium phosphate, 200 mmol/L; DTT, 2 mmol/L; Triton X-100, 0.2% (v/v); glycerol, 50% (v/v), pH approximately 7.2
Volume activity: ≥20 U/µL
Specific activity: ≥50 kU/mg protein
Unit definition: One unit Transcriptor Reverse Transcriptase is defined as the amount of enzyme which incorporates 1 nmol of [^{3}H]TMP into an acid insoluble product in 10 minutes at +37°C with poly(A)x(dT)15 as substrate.
Purity (SDS PAGE): ≥90%
Unspecific endonucleases (MWM III DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable in up to 25 U after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable in up to 40 U after 4 hours incubation at +37°C.
Function test in RT-PCR (human skeletal muscle total RNA, 10 kb dystrophin gene fragment): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® instrument (PBGD gene fragment from RNA standards): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 12 months.

Transcriptor RT Buffer

5x concentrated

Standard reaction buffer for Transcriptor Reverse Transcriptase.

Catalog number	Pack size
03 531 325 103	1 mL

Will be supplied as “Transcriptor RT Buffer”. Unit of measure is “piece”.

For further processing only.

Application

Use Transcriptor RT Buffer as an optimized reaction buffer for Transcriptor Reverse Transcriptase for synthesis of cDNA from total RNA or mRNA.

Specification

Appearance: Clear, colorless solution
Contents: Tris/HCl, 250 mmol/L; KCl, 150 mmol/L; $MgCl_2$, 40 mmol/L; pH approximately 8.5 at +25°C
Unspecific endonucleases (MWM III DNA): Not detectable after 16 hours incubation at +37°C.
Nicking activity (pBR322 DNA): Not detectable after 16 hours incubation at +37°C.
Ribonucleases (MS2 RNA): Not detectable after 4 hours incubation at +37°C.
Function test in 2-step RT-PCR (human total RNA, 10 kb dystrophin gene fragment): Corresponds to reference
Function test in real-time RT-qPCR using the LightCycler® Instrument (RNA standards, PBGD gene fragment): Corresponds to reference
Animal-derived additives: None
Stability: At -15 to -25°C within specification range for 24 months.

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

2.3x concentrated

Catalog number	Pack size
05 987 687 190	1 kit, 5 mL plus manganese acetate

05987687190: Will be supplied as “KIT 1-STEP MMX W/ROX 1 x 5 mL RUO”. Unit of measure is “piece”.

For life science research only. Not for use in diagnostic procedures.

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

Contents

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

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 $1x10^4$ 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.

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.

Catalog number	Pack size
06 402 283 190	1 kit, 5 mL plus manganese acetate
06 402 305 190	1 kit, 50 mL plus manganese acetate

Will be supplied as "KIT HAWKZ05 1STEP RTPCR LYO W/O ROX 5 mL" or "KIT HAWKZ05 1STEP RTPCR LYO W/O ROX 50 mL". Unit of measure is "piece".

Application

Apply HawkZ05 Fast One-Step RT-PCR Lyo Kit for:

- Preparation of dried reaction mixes
- High-throughput quantitative gene expression analysis
- Target detection and quantification
- 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.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 20 and 30 cycles using starting template of $1x10^4$ copy pAW 109 per reaction. Average CT value of real-time PCR test is within ±2 cycles of the proven specification.
Stability: At -15 to -25°C within specification range for 12 months.

Contents

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

Catalog number	Pack size
06 402 232 190	1 kit, 5 mL plus manganese acetate
06 402 267 190	1 kit, 50 mL plus manganese acetate

Will be supplied as “KIT HAWKZ05 1STEP RTPCR LYO W/ROX 5mL” or “KIT HAWKZ05 1STEP RTPCR LYO W/ROX 50mL”. Unit of measure is “piece”.

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
- 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.
- **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.

EC 2.7.7.7

Specification

Appearance: Clear, colorless solution
Function test: Average CT value of positive controls tested is between 20 and 30 cycles using starting template of $1x10^4$ copy pAW 109 per reaction. Average CT value of real-time PCR test is within ±2 cycles of the proven specification.
Stability: At -15 to -25°C within specification range for 12 months.

Contents

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

EvoScript RNA Master

5x concentrated

Catalog number	Pack size
07 873 468 001	5 mL

Will be supplied as “EvoScript RNA Master, 5 mL”. Unit of measure is “piece”.

For further processing only.

True one-tube 5x hot start RT-PCR 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 testRT-qPCR, G6PDH (on LC480 II with human reference RNA and G6PDH assay): Corresponds to reference
Stability: At -15 to -25°C within specification range for 15 months.

DNA Amplification - Polymerases

	Hot Start DNA Polymerase for high specificity							
Hotstart mechanism	Aptamer-mediated		Antibody-mediated				Chemical modification	
Your enzyme of choice	AptaTaq	AptaTaq delta exo	KAPA2G Fast	KAPA2G Robust	KAPA3G HotStart	KAPA3G Plant	FastStart	EagleTaq
Experience	**Stability**	**Allele Differentiation**	**Speed**	**Speed and Persistance**	**Strength**	**Resilience**	**Performance**	**Versatility**
Hotstart activation time	0 min.	0 min.	0 min.	0 min.	0 min.	0 min.	5-10 min.	10-15 min.
Amplicon size	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 5 kb	up to 3 kb	up to 3 kb
Hydrolysis probes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Compatible with UNG carryover prevention	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speed (extension rate)	●●○○○	●●○○○	●●●●●	●●●●○	●●●●○	●●●●○	●●○○○	●●○○○
inhibitor resistance	●○○○○	●○○○○	●●●○○	●●●●○	●●●●●	●●●●●	●○○○○	●○○○○
Fidelity (vs. WT Taq)	No	No	No	No	No	Yes	No	No
Stability	●●●●●	●●●●●	●●●○○	●●●○○	●●●○○	●●●○○	●●○○○	●●○○○
Standard formulation	5U/ul, 50% glycerol	5U/ul, 50% glycerol	5U/ul, 50% glycerol	5U/ul, 50% glycerol	30U/ul, Glycerol-free	5U/ul, 50% glycerol	5U/ul, 50% glycerol	5U/ul, 50% glycerol
Lyo-ready formulation	50U/ul, ≤0.1% glycerol	50U/ul, ≤0.1% glycerol			Glycerol-free		100U/ul, ≤0.1% glycerol	
Material numbers	05187605103 05457882103 05447895103 05884314103	05364086103 05458030103	08041202001 08918686103 (KAPA2G HotStart Enzyme Stand alone + Buffer A)	08041121001 08918686103 (KAPA2G HotStart Enzyme Stand alone + Buffer B)	8918651103	08041091001	12161508103 04433785103 04659163103	05206944190 05206952190

	DNA Polymerase		
Hotstart mechanism			
Your enzyme of choice	Taq	Expand High Fidelity PCR System	Expand Long Template PCR System
Experience	**Economy to Results**	**Fidelity**	**Long Template**
Hotstart activation time	0 min.	0 min.	0 min.
Amplicon size	up to 3 kb	up to 5 kb	5 to 20 kb
Hydrolysis probes	Yes	Yes	Yes
Compatible with UNG carryover prevention	Yes	Yes	Yes
Speed (extension rate)	●●○○○	●○○○○	●○○○○
inhibitor resistance	●○○○○	●●○○○	●●○○○
Fidelity (vs. WT Taq)	No	Yes	Yes
Stability	●●●●○	●●●●○	●●●●○
Standard formulation	5U/ul, 50% glycerol	>3.5U/ul, 50% glycerol	5U/ul, 50% glycerol
Lyo-ready formulation	50U/ul, ≤0.1% glycerol		
Material numbers	11147633103 04827007103	03310256103	03321053103

DNA Amplification – Master Mix

	Hot Start DNA Polymerase for high specificity							
Hotstart mechanism	**Aptamer-mediated**		**Antibody-mediated**				**Chemical modification**	
Your enzyme of choice	**AptaTaq DNA / Genotyping Master**	**NxtScript DNA Master**	**KAPA2G Fast Ready Mix**	**KAPA2G Robust Ready Mix**	**KAPA PROBE FORCE**	**KAPA3G HotStart**	**FastStart DNA Master**	**EagleTaq DNA Master Mix**
Experience	**Stability**	**Multiplexing**	**Speed**	**Speed and Persistance**	**Strength**	**Strength**	**Performance**	**Versatility**
Hotstart activation time	0 min.	0 min.	0 min.	0 min.	0 min.	0 min.	5-10 min.	10-15 min.
Amplicon size	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb	up to 3 kb
Hydrolysis probes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compatible with UNG carryover prevention	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speed (extension rate)	●●○○○	●●○○○	●●●●●	●●●●○	●●●●○	●●●●○	●●○○○	●●○○○
inhibitor resistance	●○○○○	●○○○○	●●●○○	●●●●○	●●●●●	●●●●●	●○○○○	●○○○○
Fidelity (vs. WT Taq)	No	No	No	No	No	No	No	No
Stability	●●●●●	●●●●●	●●●●○	●●●●○	●●●●○		●●●○○	●●●○○
Concentration	5x	5x	2x	2x	2x	10x	2x	2x
Lyo-ready formulation	5x, ≤0.1% glycerol	-	-	-	-	Glycerol-free	-	-
Material numbers	05537533103 05955807103 05955823103 05890144103	07368143103	08041172001	08041113001	08041237001 08041229001	9084711103	04659155103	05529085190 07073356190 07073313190

RNA Reverse Transcription - Enzymes and Master Mixes

	One-Step RT-PCR			Two-Step RT-PCR	
Your enzyme or master mix of choice	**DNA Pol. With RT act.**	**Master Mix**		**Reverse Transcriptases**	
	HawkZ05 Fast	**HawkZ05 Fast One-Step RT-PCR Master**	**EvoScript RNA Master**	**NxtScript RT**	**M-MLV RT**
Experience	**Fast RT-step**	**Versatility**	**Confidence and ease of use**	**Multiplex**	**Economy to results**
Hot Start mechanism	aptamer-mediated	aptamer-mediated	aptamer / chem. mod.	-	-
No. of components	n/a	2	1	n/a	n/a
RT-step (temperature)	60-65°C	60-65°C	60-65°C	45-55°C	40-45°C
RT-step (time)	0.5 -10 min.	0.5 -10 min.	3 -15 min.	3 -10 min.	3 -10 min.
PCR hot start activation tir	0 min.	0 min.	5-10 min.	n/a	n/a
Amplicon Size	up to 1 kb	up to 1 kb	up to 1 kb	up to 10 kb	up to 10 kb
Stability	●●●●●	●●●●●	●●●●○	●●●●○	●●○○○
Compatible with UNG carryover prevention	Yes	Yes	Yes	n/a	n/a
Multiplexing	●●●●●	●●●●●	●●●●●	●●●●●	●●●●○
Total RNA	●●○○○	●●○○○	●●●●○	●●●●●	●●●○○
mRNA	●●●●○	●●●●○	●●●●○	●●●●●	●●●●○
Viral targets	●●●●○	●●●●○	●●●●●	●●●●●	●●●●○
cDNA synthesis	n/a	n/a	n/a	●●●●○	●●●○○
GC-rich targets	●●●●●	●●●●●	●●●●○	●●●○○	●●○○○
Standard formulation	40U/ul, 50% glycerol	2.3x concentrated	5x concentrated	≥85U/ul, 50% glycerol	200U/ul, 50% glycerol
Formulation for lyophilization available	200U/ul, ≤0.1% glycerol	5x concentrated, 0.5% glycerol	-	≥250U/ul, 50% glycerol	inquire for highly conc. Solution
Material numbers	07731264103 07731329103 05230349190	06687466190 05987687190 06402283190 06402305190 06402232190 06402267190	07873468001	07051166103 07371527103	04707486103

Additional Products

Buffer guideline

Enzyme	Catalog number	Product	Unit	Pack size	Remark
Expand High Fidelity	5917123103	Expand High Fidelity PCR Buffer w/o MgCl2	PC	1ml	10X, w/o MgCL2
FastStart	5917166103	FastStart PCR Buffer without MgCl2, 10x 1 ml	PC	1ml	10X, w/o MgCL2
	12161516103	FastStart PCR Buffer with 20mM MgCl2,10x 1 ml	ML	custom fill	10x, with 20 mM MgCl2
Aptataq	7708963103	AptaTaq Fast PCR Buffer	ML	custom fill	5X, w/o MgCl2, for fast activation and short PCR reaction time
KAPA2G	9084690103	KAPA 2G Buffer A	ML	custom fill	10X, for high processivity
	9084703103	KAPA 2G Buffer B	ML	custom fill	10X, for better inhibitor tolerance
Taq	NA				Contact to Roche CustomBiotech for recommended buffer
EagleTaq	NA				Contact to Roche CustomBiotech for recommended buffer
Transcriptor	3531325103	Transcriptor RT Buffer	PC	1ml	5X

Related items

Catalog number	Product	Unit	Pack size	Remark
5187109103	Mn(OAc)2 Stock Solution, 25 mM	PC	1ml	HawkZ05 Fast DNA Polymerase to optimize the RT-PCR reaction.
11600770103	MgCl2-Slt. 25mM MPB	PC	1ml	
5917158103	GC-rich solution	PC	1ml	
11780565103	Uracil-DNA Glycosylase, heat-labile, 1U/µL	KU	custom fill	
3036430103	Water PCR grade	L	custom fill	
10197785103	1,4-Dithiothreitol (DTT)	G	custom fill	

dNTP mix

Catalog number	Product	Unit	Pack size	Remark
4729706103	dNTP Mix MPB, 200 ul, 10 mM ATGC	PC	200ul	ATGC, 10mM dNTP
4920171103	NucleoMix PCR Grade, 25 mmol/l, 20ml	ML	20ml	ATGC, 25mM dNTP
3186075103	Nucleomix(10 mmol/l,with dUTP)	ML	100ml	with dUTP, 10mM dNTP
4980905103	NucleoMix PCR Grd (dU), 25 mmol/l, 20 ml	ML	20ml	with dUTP, 25mM dNTP

dNTPs

Catalog number	Product	Unit	Pack size
4631056103	dATP PCR Grade, Sodium Solution, 20 ml	umol	2,000umol (20ml)
4631072103	dCTP PCR Grade, Sodium Solution, 20 ml	umol	2,000umol (20ml)
4631129103	dGTP PCR Grade, Sodium Solution, 20 ml	umol	2,000umol (20ml)
4631137103	dTTP PCR Grade, Sodium Solution, 20 ml	umol	2,000umol (20ml)
4631145103	dUTP PCR Grade, Sodium Solution, 20 ml	umol	2,000umol (20ml)
11889516103	dATP,Na, Solution, (PCR Grade)	umol	10,000umol (100ml)
11889508103	dCTP, Na, Solution (PCR Grade)	umol	10,000umol (100ml)
11889524103	dGTP,Na, Solution (PCR Grade)	umol	10,000umol (100ml)
11889559103	dTTP,Na, Solution (PCR Grade)	umol	10,000umol (100ml)
11889532103	dUTP,Na, Solution (PCR Grade)	umol	10,000umol (100ml)

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서울특별시 강남구 테헤란로 108길 22 (06174)
TEL : 02-550-3300 Fax : 02-550-1218
E-mail : korea.diagnostics@roche.com
Homepage : http://custombiotech.roche.com