



Product Insert

Diamond DNA Polymerase

Catalogue Numbers:

BIO-21058 250 Units
 BIO-21059 500 Units

Features

- Ideal for troublesome templates such as GC-rich regions and microsatellites
- Elimination of artifacts caused by non-specificity
- Maintains specificity in conditions designed for high performance such as high Mg²⁺, dNTPs and primer concentrations
- Available as a convenient pre-mixed, pre-optimized solution (Diamond Mix)

Applications

- Multiplex reactions
- GC-rich templates

Description

Diamond DNA Polymerase, is a variant of *Taq* DNA polymerase designed for difficult PCR templates such as high GC regions and microsatellites. When templates are challenging, the enzyme maintains excellent specificity and minimal background, even in conditions with high concentrations of Mg²⁺, primers and dNTPs. On genomic templates, Diamond can be used in the presence of MgCl₂ concentrations as high as 10mM.

Diamond also extends through inverted tandem repeats and regions with high levels of secondary structure. Due to a mutation in its active site, Diamond possesses improved nucleotide selection and a lower rate of mis-match extension. Diamond is highly specific and consequently conditions should be determined carefully for each template.

The specificity and performance of Diamond can be further improved with the use of 2x PolyMate Additive (Cat No. BIO-37041), which is designed for GC or AT-rich DNA, "dirty" templates or sequences with high levels of secondary structure.

Diamond has a very weak terminal transferase activity, and products can be assumed to be blunt-ended. However, this is sequence-dependent, and some sequences may be tailed with a single nucleotide.

Reaction Conditions (for a 50µl reaction)

10x NH ₄ Buffer	5µl
50mM MgCl ₂ Solution	2-10µl
100mM dNTP Mix (see below)	0.5-1.0µl
Template and primers	as required
Enzyme	0.2-1.0µl
Water (ddH ₂ O)	up to 50µl

Bioline 100mM dNTP Mix is available as a separate product (Cat No. BIO-39028).

Denature: 94-97°C

Extension: 72°C Allowing 2 mins per Kb

This data is intended for use as a guide only, conditions will vary from reaction to reaction and may need optimization.

It is advisable to determine the optimum concentration of Magnesium. Start with titrations of 2-7mM (final conc.). For <500bp size, the use of 2.5u of enzyme in a 50µl reaction is recommended, whereas 5u is recommended for 500-1500bp size. (For initial tests, it is advisable to run a positive control reaction using BIOTAQ DNA polymerase under standard conditions.)

Product Specifications

Batch details:

Batch No: See vial
 Units per vial: See vial
 Concentration: 5u/µl

Components

Diamond DNA Polymerase	250 Units	500 Units
Diamond DNA Polymerase	50µl	100µl
10x NH ₄ Reaction Buffer	1.2ml	2 x 1.2ml
50mM MgCl ₂ Solution	1.2ml	1.2ml

Reagent Specifications:

10x NH₄ Reaction Buffer: 160mM (NH₄)₂SO₄, 670mM Tris-HCl (pH 8.8 at 25°C), 0.1% stabilizer
 MgCl₂ Stock Solution: 50mM MgCl₂

Storage and Dilution Buffer:

20mM Tris-HCl, pH 7.5, 100mM NaCl, 0.1mM EDTA, 2mM DTT, 50% Glycerol, and stabilizers.

Storage Conditions:

Diamond can be stored for 12 months at -20°C.

Shipping Conditions:

On Dry Ice or Blue Ice

Unit Definition:

One unit is defined as the amount of enzyme that incorporates 10nmoles of dNTPs into acid-insoluble form in 30 minutes at 72°C.

Associated Activities:

Endonuclease and exonuclease activities were not detectable after 4 hours incubation of 1µg of pBR322 plasmid DNA and 0.5 µg of *Hind III*-digested Lambda DNA at 72°C in the presence of 20 units of Diamond DNA polymerase.

Associated Products:

Product Name	Pack Size	Cat No
dNTP Set	4 x 25µmol	BIO-39025
dNTP Mix 100mM total	1 x 500µl	BIO-39028
2x PolyMate Additive	2 x 1.2ml	BIO-37041
HyperLadder I	200 Lanes	BIO-33025
Agarose	100g	BIO-41026

Product Citations:

1. Paracchini, S., et al. *Nucleic Acids Research* **30(6)**, (2002).
2. Hajibabaei, M., et al. *Philosophical Transactions of the Royal Society B: Biological Sciences* **360(1462)**, 1959-1967 (2005).
3. Lees, A.K., et al. *Plant Pathology* **51(3)**, 293 (2002).

Notes

1. This product insert is a declaration of analysis at the time of manufacture.
2. Research Use Only.

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