

9°N™ DNA Ligase



1-800-632-7799
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M0238S 002121114111

M0238S



2,500 units 40,000 U/ml Lot: 0021211

RECOMBINANT Store at -20°C Exp: 11/14

Description: 9°N™ DNA Ligase catalyzes the formation of a phosphodiester bond between juxtaposed 5' phosphate and 3' hydroxyl termini of two adjacent oligonucleotides which are hybridized to a complementary target DNA. 9°N DNA Ligase is active at elevated temperatures (45°C–90°C).

Source: Purified from an *E. coli* strain containing the cloned ligase gene from the extremely thermophilic marine archaea *Thermococcus* sp. (strain 9°N). The archaea was isolated from a submarine thermal vent, at a depth of 2,500

meters, 9° north of the equator at the East Pacific Rise (1).

Supplied in: 50 mM KCl, 10 mM Tris-HCl (pH 7.5), 0.1 mM EDTA, 1 mM DTT, 10 mM ammonium sulfate, 200 µg/ml BSA and 50% glycerol.

Applications:

- Allele-specific gene detection using Ligase Detection Reaction and Ligase Chain Reaction (2,4).
- Mutagenesis by incorporation of a phosphorylated oligonucleotide during PCR amplification (5).

Reagents Supplied with Enzyme:

10X 9°N DNA Ligase Reaction Buffer:

Reaction Conditions: Incubate DNA and enzyme in 1X 9°N DNA Ligase Reaction Buffer at 45°C for 15 minutes or in a thermocycler with a program suited to the reaction described by Barany (1991) Genetic Disease Detection and DNA Amplification Using Cloned Thermostable Ligase. *Proc. Natl. Acad. Sci. USA* 88, 189–193. The reaction is stopped with a mixture of 50% glycerol, 50 mM EDTA, bromphenol blue.

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1X 9°N DNA Ligase Reaction Buffer:

10 mM Tris-HCl
600 µM ATP
2.5 mM dithiothreitol
2.5 mM MgCl₂
0.1% Triton X-100
(pH 7.5 @ 25°C)

Unit Definition: (Cohesive End Unit)

One unit is defined as the amount of enzyme required to give 50% ligation of the 12-base pair cohesive ends of 1 µg of BstEII-digested λ DNA in a total reaction volume of 50 µl in 15 minutes at 45°C.

A cohesive end unit is equivalent to the nick-closing unit (1).

Unit Assay Conditions: 1X 9°N DNA Ligase Reaction Buffer and 20 µg/ml BstEII-digested λ DNA in a 50 µl reaction. After incubation at 45°C for 15 minutes, the reaction is terminated by addition of stop dye (50% glycerol, 50 mM EDTA and bromphenol blue), heated at 70°C for 10 minutes and then loaded on a 0.7% agarose gel. Due to the presence of ligase, the cos ends of BstEII-digested λ DNA will stay together after 70°C heat treatment.

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Heat Inactivation: No

Quality Control Assays

Phosphatase Activity: Incubation of 5,000 units for 16 hours at 37°C in NEBuffer 2 released less than 0.05 µmol of inorganic phosphate from para-nitrophenol phosphate.

Non-specific Endonuclease and Exonuclease

Activity: Incubation of 5,000 units for 16 hours at 37°C in NEBuffer 2 with 1 µg 2-Log DNA Ladder fragments does not alter the expected banding pattern on agarose gels.

Note: 9°N DNA Ligase is not a substitute for T4 DNA Ligase. The cohesive end unit is equivalent to the nick-closing unit of Barany et al.

(See other side)

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2. Barany, F. (1991) *Proc. Natl. Acad. Sci. USA* 88, 189-193.
3. Takahashi, M. et al. (1984) *J. Biol. Chem.* 259, 10041–10047.
4. Barany, F. (1991) *The Ligase Chain Reaction in a PCR World* (pp. 5–16). Cold Spring Harbor: Cold Spring Harbor Laboratory Press.
5. Michael, S.F. (1994) *Biotechniques* 16, 411–412.

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References:

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