

# T4 DNA Ligase

ArcticZymes T4 DNA Ligase is an ATP and Mg<sup>2+</sup> dependent dsDNA ligase which catalyses the formation of a phosphodiester bond between 3'-hydroxyl and 5'-phosphate termini in duplex DNA, duplex RNA, and some DNA/RNA hybrids. The enzyme is recombinantly produced in *E. coli*.

T4 DNA Ligase is active on both blunt-end and cohesive-end substrates. It is also completely inactivated by incubating at 70°C for 10 minutes.

T4 DNA Ligase is extensively tested for contaminating DNase and RNase activities as well as residual host-cell gDNA.

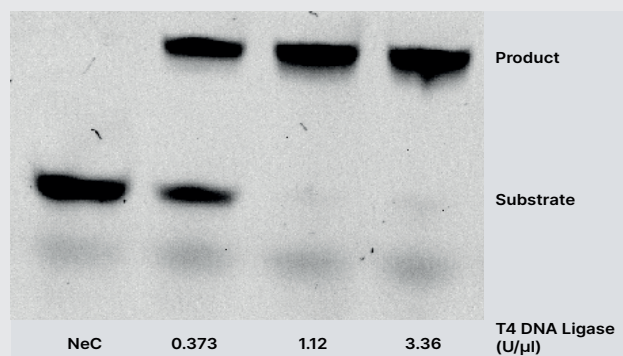


Fig 1. T4 DNA Ligase displays good nick-joining activity of dsDNA

**T4 DNA Ligase activity on various substrates.** *In vitro* assays of ligation activity were performed using three oligos hybridised into a nicked 20 bp dsDNA substrate. Efficient DNA ligation was observed after 30 min at 25°C when using 1.12 U/μl T4 DNA Ligase. At 0.373 U/μl T4 DNA Ligase showed about 70% substrate turnover.

## Specifications

<b>Optimal reaction conditions</b>	50 mM Tris-HCl (pH 7.5 at 25°C), 10 mM DTT, 5 mM MgCl <sub>2</sub> and 1 mM ATP.
<b>Storage buffer</b>	10 mM Tris-HCl pH 7.5 at 25°C 50 mM KCl 1 mM DTT 0.1 mM EDTA 50% (v/v) Glycerol
<b>Stability</b>	The enzyme is stable for at -20°C for 1 year in the supplied storage buffer. The enzyme tolerates a minimum of four freeze-thaw cycles (-80°C) without loss of activity.

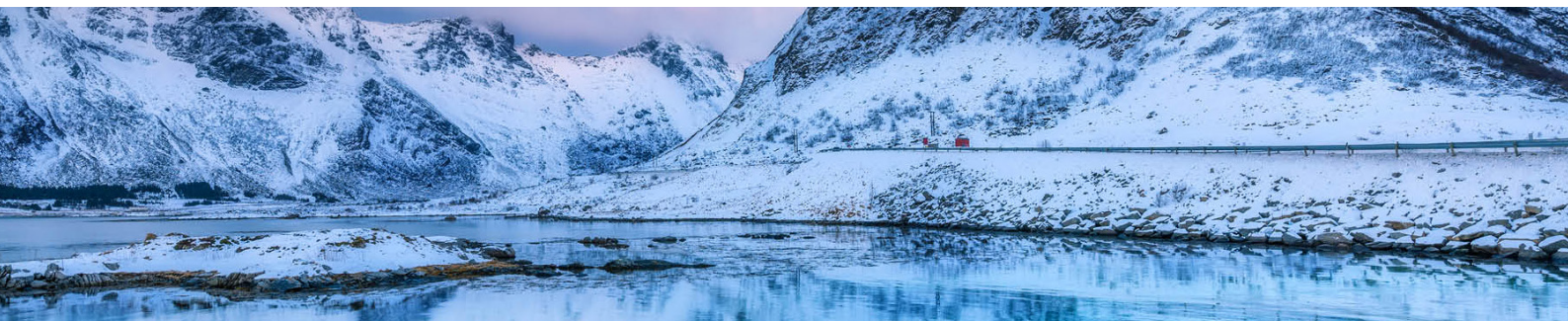
## Quality control

<b>dsDNA endonuclease activity</b>	10 000 U T4 DNA Ligase was incubated with a supercoiled plasmid (1 μg) for 4 hours at 37°C. Agarose gel electrophoresis did not reveal any transformation of closed circular DNA to nicked DNA.
<b>ssDNA endonuclease activity</b>	10 000 U T4 DNA Ligase was incubated with M13 ssDNA (0.5 μg) for 4 hours at 37°C. Agarose gel electrophoresis did not reveal any visible signs of ssDNA degradation.
<b>Exonuclease activity</b>	10 000 U T4 DNA Ligase was incubated with either 3H-dATP labelled ds or ssDNA (0.5 μg, 500 bp) for 4 hours at 37°C. Acid soluble radioactivity from labelled DNA was not significantly over blank test for either substrate.
<b>RNase activity</b>	5000 U T4 DNA Ligase was incubated with a 2 kb RNA transcript (0.5 μg) for 4 hours at 37°C. Agarose gel electrophoresis did not reveal any visible signs of RNA degradation.
<b><i>E. coli</i> gDNA contamination</b>	5000 U T4 DNA Ligase was analysed in a probe-based qPCR assay detecting the 23S ribosomal subunit in <i>E. coli</i> . No <i>E. coli</i> gDNA could be detected (LOD: < 3 <i>E. coli</i> genomic copies.).

## Ordering information

	Article no.	Pack size*	Concentration
<b>T4 DNA Ligase</b>	71800-202	250 kU	≥ 5000 U/μl
	71800-100	Custom	Custom

\* One unit is defined as the amount of enzyme required to give 75% ligation of the 2322 and 2927 bp HindIII fragments of λ DNA (5'-DNA termini concentration of 0.12 μM, 300 μg/ml) in a total reaction volume of 20 μl in 30 minutes at 16°C in 50 mM Tris-HCl (pH 7.5 @ 25°C), 10 mM MgCl<sub>2</sub>, 1 mM ATP and 10 mM DTT. One Weiss unit corresponds to approximately 500 ArcticZymes units.



# Your OEM Partner to deliver novel solutions for genomics and proteomics.

## Quality

ArcticZymes is dedicated to the quality of our products and certified according to ISO 13485:2016. ArcticZymes offers the convenience of providing standard bulk enzymes as off the shelf products. In addition, ArcticZymes offers enzymes in customized formats. For additional information, please contact us.

## Additional information

We are pleased to provide data and information relating to T4 DNA Ligase. Available data includes stability, buffer storage conditions, pH, specific activity data. For more information, please check our website [www.arcticzymes.com](http://www.arcticzymes.com).

### ArcticZymes Technologies ASA

Sykehusveien 23  
N-9294 Tromsø, Norway

**T** (47) 7764 8900  
**E** [contact@arcticzymes.com](mailto:contact@arcticzymes.com)  
**I** [www.arcticzymes.com](http://www.arcticzymes.com)

### ArcticZymes Technologies ASA

987 Old Eagle School Road, Suite 709  
Wayne, PA 19087, USA

**T** (484) 534 3567  
**F** (484) 368 3558  
**E** [contact-us@arcticzymes.com](mailto:contact-us@arcticzymes.com)

### ArcticZymes AS

Handelswei 1A 8501 XJ  
Joure, the Netherlands

**T** (47) 7764 8900  
**E** [contact@arcticzymes.com](mailto:contact@arcticzymes.com)  
**I** [www.arcticzymes.com](http://www.arcticzymes.com)

**Disclaimer:** These products are intended for further manufacturing use or research use only. Certain applications of ArcticZymes Technologies ASA products may require licenses from others. It is the expressed duty of any receiver of ArcticZymes Technologies ASA products to acquire such licenses, if necessary. To the extent allowed by law, ArcticZymes Technologies ASA will not be liable for damages, whether direct, indirect, incidental, or consequential in connection with or arising from this document, including the use of it. ArcticZymes Technologies ASA products may be covered by pending or issued patents, designs or design applications and/or trademarks or trademark applications or any other registered or unregistered Intellectual Property Right. Version 2.0 • June 2021