

Thermostable Inorganic Pyrophosphatase

REF: EG25106S

Storage Condition

Store at -20°C for 2 years.

Components

Component	Amount
Thermostable Inorganic Pyrophosphatase (2 U/μl)	100 μl

Description

Thermostable inorganic pyrophosphatase was derived from the extremely thermostable *Thermococcus litoralis* gene, and was recombinantly expressed in *Escherichia coli*. It catalyzes the hydrolysis of inorganic pyrophosphates to form orthophosphate: $P_2O_7^{4-} + H_2O + PPase \rightarrow 2HPO_4^{2-}$. Compared with Inorganic Pyrophosphatase (Yeast) (REF: EG23109), this product features superior thermostability and retains 100% activity after heating at 100°C for 4 hours. In addition to in vitro transcription, it can be used for high-temperature polymerization reactions such as PCR and LAMP.

Definition of Activity Unit

One unit is the amount of enzyme that will generate 1 μmol of phosphate per minute from inorganic pyrophosphate under standard reaction conditions (a 10 minute reaction at 75°C in 50 mM Tricine [pH 8.5], 1 mM MgCl₂, 0.32 mM PPI, reaction volume of 0.5 ml).

Applications

1. In Vitro Transcription: Enhances RNA yield in in vitro transcription reactions.
2. DNA synthesis: Increases the yield of DNA in processes such as PCR and LAMP.
3. Catalyze the conversion of inorganic pyrophosphate to orthophosphate.

Quality Control Assays

Protein Purity

The enzyme is ≥95% pure as determined by SDS-PAGE analysis using Coomassie Blue staining.

Endonuclease Activity

A 20 μl reaction containing 200 ng of supercoiled plasmid and 2 U of Thermostable Inorganic Pyrophosphatase incubated for 4 hours at 37°C results in <20% conversion to the nicked or linearized form as determined by agarose gel electrophoresis.

DNase Activity

A 20 μl reaction containing 15 ng of dsDNA fragments and 2 U of Thermostable Inorganic Pyrophosphatase incubated for 16 hours at 37°C results in no detectable degradation of the dsDNA fragments as determined by agarose gel electrophoresis.

RNase Activity

A 10 μl reaction containing 500 ng of RNA and 2 U of Thermostable Inorganic Pyrophosphatase incubated for 1 hour at 37°C results in >90% of the substrate RNA remains intact as determined by agarose.

Residual Host DNA

Using the third method of qPCR specified in General Chapter 3407 of ChP(2025) Volume IV, the residual *Escherichia coli* host cell DNA content of this product is below 1 copy/2 U.

Notice

1. This product cannot be thermally deactivated.
2. This enzyme is active in a variety of reaction buffers and can typically be added directly to experiments such as PCR and LAMP.
3. Enzyme volume needs to be optimized in different experiments, and the recommended concentration is 0.05~2 U/ml.