



## Bst II Pro DNA Polymerase Large Fragment

*Bacillus stearothermophilus* DNA polymerase expressed in *E. coli*

Catalog # BP01-E311

Lot # Y4280-22

### Product Description

Large fragment of the *Bacillus stearothermophilus* DNA polymerase protein which possesses 5' → 3' polymerase activity but lacks 5' → 3' exonuclease activity.

### Components

	Component Name	800U	8000U
	Bst DNA Polymerase Large Fragment (8 U/μl)	1 x 100μl	1x 1ml
b	10 × ThermoPol Buffer	1 x 750μl	3 x 1ml
c	MgSO <sub>4</sub> (100 mM)	1 x 450μl	2 x 1ml

### Formulations

Enzyme	10 mM Tris-HCl pH 7.5, 50 mM KCl, 0.1 mM EDTA, 1 mM DTT, 0.1% Triton X-100, 50% glycerol
b	200 mM Tris-HCl pH 8.8, 100 mM KCl, 100 mM (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> , 20 mM MgSO <sub>4</sub> , 1% Triton X-100
c	100 mM solution of MgSO <sub>4</sub>

### Storage and Stability

Store product at -30°C to -15°C. For optimal performance aliquot product into smaller quantities after centrifugation and store at recommended temperature. Avoid repeated handling and multiple freeze/thaw cycles.

### Scientific Background

Bst II Pro DNA Polymerase Large Fragment is a portion of the *Bacillus stearothermophilus* DNA polymerase protein which possesses 5' → 3' polymerase activity but lacks 5' → 3' exonuclease activity (1). Bst II Pro DNA Polymerase large fragment has low reaction temperature, high sensitivity and high amplification speed. This product is recommended for loop mediated isothermal amplification (LAMP) (2).

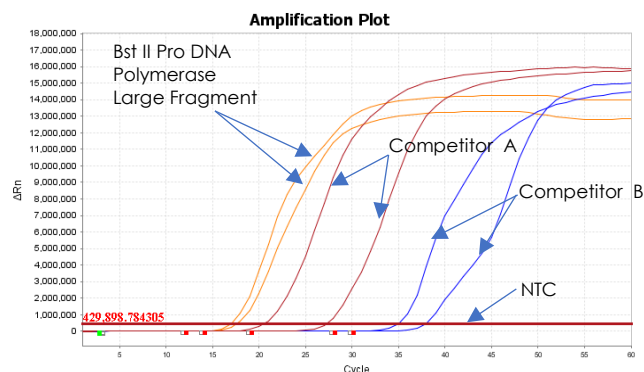
### References

1. Aliotta JM, Pelletier JJ, Ware JL, Moran LS, Benner JS, Kong H. Thermostable Bst DNA polymerase I lacks a 3'→5' proofreading exonuclease activity. *Genet Anal.* 1996 Mar;12(5-6):185-95. PMID: 8740835.
2. Soroka M, Wasowicz B, Rymaszewska A. Loop-Mediated Isothermal Amplification (LAMP): The Better Sibling of PCR? *Cells.* 2021 Jul 29;10(8):1931. PMID: 34440699; PMCID: PMC8393631.

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### Activity



Performance of Bst II Pro DNA polymerase Large fragment and competitors in RT-LAMP. Actin gene was amplified from a sample of purified RNA collected on a swab.

### Unit Definition:

One unit corresponds to the amount of enzyme that incorporates 10 nmol of dNTPs into acid insoluble materials in 30 minutes at 65°C.

**This product is manufactured in an ISO 9001 and ISO 13485 certified facility**

## Bst II Pro DNA Polymerase Large Fragment

*Bacillus stearothermophilus* DNA polymerase protein

Catalog #	BP01-E311
Lot #	Y4280-22
Purity	≥90%
Concentration	8 U/μl
Stability	1yr at -30°C~-15°C from date of shipment
Storage & Shipping	Store product at -30°C~-15°C. For optimal storage and performance aliquot product into smaller quantities after centrifugation and store at recommended temperature. Avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

# LAMP Assay Protocol

**Principle:** Loop mediated isothermal amplification (LAMP) takes advantage of a DNA polymerase that possesses strand displacement activity to allow for DNA amplification at a constant temperature.

1. Take out the Bst II Pro DNA Polymerase Large Fragment and thaw it on ice. Vortex and briefly centrifuge before use.
2. Except for the template DNA, the reaction mixture of other components is prepared in the following order:

Components	25 $\mu$ l / rxn
10 $\times$ ThermoPol Buffer	2.5 $\mu$ l
MgSO <sub>4</sub> (100 mM)	1.5 $\mu$ l
dNTP Mix (10 mM each)	3.5 $\mu$ l
10 $\times$ SYBR Green I	0.5 $\mu$ l
FIP/BIP Primers (100 $\mu$ M)	0.4 $\mu$ l each
F3/B3 Primers (100 $\mu$ M)	0.05 $\mu$ l each
LoopF/LoopB Primers (100 $\mu$ M)	0.2 $\mu$ l each
Bst II Pro DNA Polymerase Large Fragment (8 U/ $\mu$ l)	1.0 $\mu$ l
DNA Template	1.0 - 5.0 $\mu$ l
Nuclease-Free Water	up to 25 $\mu$ l

1. Reactions should be set up on ice. The reagent and template DNA should be prepared in different areas to avoid contamination.
2. Mix gently and centrifuge briefly.
3. Incubate the reaction at 60 ~ 65°C for 30 ~ 60 mins.
4. If analyzing via agarose gel electrophoresis or other method requiring opening LAMP reaction vessels, setup secondary analysis area and equipment to avoid contamination.
5. Always run a no-template control to ensure amplification specificity.

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## Article 1 - Product Identification

**Product Name: Bst II Pro DNA Polymerase Large Fragment**

**Catalog # BP01-E311**

*This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.*

Supplier's Name: SignalChem Biotech Inc.  
 Street Address: 110-13120 Vanier Place  
 City, Prov. Postal Code: Richmond, BC, V6V 2J2  
 Country: Canada  
 Fax: 604-232-4601  
 EMERGENCY PHONE: 604-232-4600

## Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Skin irritation (Category 3); Eye irritation (Category 2B).
- **Hazard Pictograms:** none.
- **Signal words:** Warning.
- **Hazard statements:** Causes mild skin irritation (H316); Causes eye irritation (H320).
- **Precautionary statements:** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305 + P351 + P338).
- **Other hazards:** none known.

## Article 3 - Composition/Information on Ingredients

**Chemical Characterization:** Mixtures.

**Description:** This product consists of the substances listed below.

Component: Bst DNA Polymerase Large Fragment

Common name	Chemical name	CAS-No.	Concentration
Glycerol	Glycerol	56-81-5	50%
DTT	1,4-Dithio-DL-threitol	3483-12-3	0.0154%
EDTA	Ethylenediaminetetraacetic Acid	23411-34-9	0.0029%
KCl	Potassium Chloride	7447-40-7	0.3728%
Tris-HCL	2 - Amino - 2 - (hydroxymethyl) propane - 1, 3 - diol hydrochloride	1185-53-1	0.1576%
Triton X-100	2-[4-(2,4,4-trimethylpentan-2-yl)phenoxy]ethanol	9002-93-1	0.1%
Protein	No data available	No data available	Not determined

Component: 10 × ThermoPol Buffer

Common name	Chemical name	CAS-No.	Concentration
MgSO <sub>4</sub>	Magnesium sulfate	7487-88-9	0.2407%
Tris-HCl	2 - Amino - 2 - (hydroxymethyl) propane - 1, 3 - diol hydrochloride	1185-53-1	2.4%
KCl	Potassium Chloride	7447-40-7	0.7455%
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	Ammonium Sulfate	7783-20-2	1.3%
Triton X-100	2-[4-(2,4,4-trimethylpentan-2-yl)phenoxy]ethanol	9002-93-1	1%

Component: MgSO<sub>4</sub>

Common name	Chemical name	CAS-No.	Concentration
MgSO <sub>4</sub>	Magnesium sulfate	7487-88-9	1.2%

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## Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** Breath in fresh air. If cannot breathe, give artificial respiration and consult a physician.
- **After skin contact:** Immediately wash with soap and plenty of water and rinse thoroughly. Consult a physician.
- **After eye contact:** Rinse opened eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Consult a physician.
- **After swallowing:** Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

## Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Use water spray, extinguishing powder, carbon dioxide, or other appropriate measure that is suitable to the environment.
- **Specific hazards arising from the substance or mixture:** None known.
- **Special protective equipment and precautions for fire-fighters:** Self-contained breathing apparatus if necessary.

## Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:** Apply standard laboratory practices and personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter drains.
- **Methods and materials for containment and cleaning up:** Absorb on sand or vermiculite and place in closed containers for disposal.

## Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Store in a dry and well-ventilated place in -30 °C~-15 °C. Keep container upright and tightly closed.

## Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**  
Glycerol (CAS-No: 56-81-5)

Values	Control parameters	Regulations
TWA	10 mg/m <sup>3</sup> for mist	British Columbia, Canada
TWA	3 mg/m <sup>3</sup> for respirable mist	British Columbia, Canada
TWA	10 mg/m <sup>3</sup>	Alberta, Canada
TWAEV	10 mg/m <sup>3</sup>	Ontario, Canada
TWAEV	10 mg/m <sup>3</sup>	Quebec, Canada
TWA	10 mg/m <sup>3</sup>	USA

- **Appropriate engineering controls:**  
Apply adequate ventilation including mechanical exhaust or laboratory fume hood. Follow standard laboratory practices.
- **Individual protection measures:**  
**Respiratory protection:**  
Use appropriate respirator if there is inadequate ventilation by following the government standards.  
**Hand protection:**  
Wear gloves and use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.  
**Eye/face protection:**  
Safety goggles with side-shields approved under appropriate government standards.  
**Skin/body protection:**  
Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

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## Article 9 – Physical and Chemical Properties

<b>Appearance:</b> Colorless fluid.	<b>Danger of explosion:</b> Product does not present an explosion hazard.
<b>Odour/Odour Threshold:</b> Not determined.	<b>Explosion limits:</b> Not determined.
<b>pH:</b> ~7.2.	<b>Decomposition temperature:</b> Not available.
<b>Melting point/freezing point:</b> Not determined.	<b>Vapor pressure at 20 °C:</b> Not determined.
<b>Boiling point/Boiling range:</b> 106 °C.	<b>Density:</b> ~1.12g/cm <sup>3</sup> .
<b>Flash point:</b> Not determined.	<b>Relative density:</b> Not determined.
<b>Flammability (solid, gaseous):</b> Not determined.	<b>Vapor density:</b> Not determined.
<b>Ignition temperature:</b> Not determined.	<b>Evaporation rate:</b> Not determined.
<b>Auto-igniting:</b> Product is not self-igniting.	<b>Solubility in / Miscibility with Water:</b> Fully miscible.

## Article 10 - Stability and Reactivity

- **Reactivity:** Stable under recommended transport and storage conditions.
- **Chemical stability:** Stable under recommended transport and storage conditions.
- **Possible hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Not determined.
- **Hazardous decomposition products:** Not determined.

## Article 11 - Toxicological Information

- **Acute toxicity:** Not available.
- **LD/LC50:** Not available.
- **Skin corrosion/irritation:** Not available.
- **Serious eye damage/eye irritation:** Not available.
- **Respiratory or skin sensitization:** Not available.
- **Germ cell mutagenicity:** Not available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** Not available.
- **Teratogenicity:** Not available.
- **Specific target organ toxicity - single exposure/ - repeated exposure (GHS):** Not available.
- **Aspiration hazard:** Not available.
- **Potential health effects:**  
**Inhalation:** May be harmful if inhaled. May cause respiratory tract irritation.  
**Ingestion:** May be harmful if swallowed.  
**Skin:** May be harmful if absorbed through skin. May cause skin irritation.  
**Eyes:** May cause eye irritation.
- **Signs and Symptoms of Exposure:**  
Prolonged or repeated exposure can cause: Nausea, Dizziness.
- **Synergistic effects:** Not available.

## Article 12 - Ecological Information

- **Eco-toxicity:** No data available.
- **Biodegradability:** Not applicable.
- **Bio-accumulative potential:** Not applicable.
- **Mobility in soil:** Not applicable.
- **PBT and vPvB assessment:** Not applicable.
- **Other adverse effects:** Not applicable.

## Article 13 - Disposal Considerations

- **Disposal methods:** In accordance to applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Disposal should be made in accordance to official regulations. Use water or cleansing agents to clean the area.

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## Article 14 - Transport Information

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- **DOT:** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

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## Article 15 – Regulatory Information

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- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

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## Article 16 - Other Information

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The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.

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