A. PCR Related Products

A-1 Standard PCR

**Taq DNA Polymerase (5U/ul)**
(Supplied with 10×reaction buffer and 20mM magnesium sulfate)

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>B0089-200U</td>
<td>200 U</td>
</tr>
<tr>
<td>B0089-5×200U</td>
<td>5×200 U</td>
</tr>
<tr>
<td>B0089-1000U</td>
<td>1,000 U</td>
</tr>
<tr>
<td>B0089-5×1000U</td>
<td>5×1,000 U</td>
</tr>
</tbody>
</table>

Storage: -20°C

**Taq** is a thermostable DNA Polymerase isolated from a strain of Thermus sp. It is designed for use in primer extension reaction. **Taq** is highly purified. No detectable contaminating endonuclease, exonuclease and nicking activity is observed.

Quality Testing: For endonuclease assay, 1g of Lambda-HindIII DNA is incubated with 20 units of the enzyme in assay buffer at 75°C for 16 hrs and no visible contaminating activity is observed. For exonuclease assay, 1g of pBR322 plasmid DNA is incubated with 10 units of the enzyme for 16 hrs at 75°C in assay buffer and no detectable activity is observed. Moreover, the purity of the enzyme is also detectable by adding 10 units of Taq DNA Polymerase in 0.1ml buffer of a reaction mixture for making first strand cDNA at beginning and no impaired effect on the first strand cDNA is observed.

**Unit Definition:**
One unit incorporates 10nmole of dNTP into acid-insoluble material in 30 min. at 74°C.

**Concentration in Storage Buffer:**
5 units/ul in 100mM KCl, 20mM Tris HCl (pH 8.0, 22°C), 0.1mM EDTA, 0.5mM PMSF, 1mM DTT, 50% glycerol.

**10×Taq Reaction Buffer:**
100mM KCl, 200mM Tris HCl (pH 8.75) at 22°C, 1% Triton X-100 and 1mg/ml BSA.
Buffer is optimized for use with 200uM dNTPs.

**Magnesium Sulfate:**
20mM MgSO₄. The final magnesium sulfate may be variable according to individual requirements. In general, 2mM MgSO₄ is recommended.

**Primer Extension Characteristics:**
Taq has the template-independent terminal transferase activity which results in the addition of a single nucleotide (adenosine) at 3’ end of extension product. So TA cloning vector is recommended if the extension product is needed to be cloned.

Storage: -20°C

* This product is not available in Canada

**Taq DNA Polymerase (5U/ul) (High Purity)**
(Supplied with 10×reaction buffer and 20mM magnesium sulfate)

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>HTD0078-200U</td>
<td>200 U</td>
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<tr>
<td>HTD0078-5×1000U</td>
<td>5×1,000 U</td>
</tr>
</tbody>
</table>

Storage: -20°C

**Taq** is a thermostable DNA Polymerase isolated from a strain of Thermus sp. It is designed for use in primer extension reaction. No detectable contaminating endonuclease, exonuclease and nicking activity is observed in Taq DNA Polymerase. **Taq DNA Polymerase (High Purity)** is further purified from Taq DNA Polymerase and therefore has a higher purity grade than Taq DNA polymerase.

Quality Testing: For endonuclease assay, 1g of Lambda-HindIII DNA is incubated with 20 units of the enzyme in assay buffer at 75°C for 16 hrs and no visible contaminating activity is observed. For exonuclease assay, 1g of pBR322 plasmid DNA is incubated with 10 units of the enzyme for 16 hrs at 75°C in assay buffer and no detectable activity is observed. Moreover, the purity of the enzyme is also detectable by adding 10 units of Taq DNA Polymerase in 0.1ml buffer of a reaction mixture for making first strand cDNA at beginning and no impaired effect on the first strand cDNA is observed.

**Unit Definition:**
One unit incorporates 10nmole of dNTP into acid-insoluble material in 30 min. at 74°C.

**Concentration in Storage Buffer:**
5 units/ul in 100mM KCl, 20mM Tris HCl (pH 8.0, 22°C), 0.1mM EDTA, 0.5mM PMSF, 1mM DTT, 50% glycerol.

**10×Taq Reaction Buffer:**
100mM KCl, 100mM (NH₄)₂SO₄, 200mM Tris HCl (pH 8.75) at 22°C, 1% Triton X-100 and 1mg/ml BSA.
Buffer is optimized for use with 200uM dNTPs.

**Magnesium Sulfate:**
20mM MgSO₄. The final magnesium sulfate may be variable according to individual requirements. In general, 2mM MgSO₄ is recommended.

**Primer Extension Characteristics:**
Taq has the template-independent terminal transferase activity which results in the addition of a single nucleotide (adenosine) at 3’ end of extension product. So TA cloning vector is recommended if the extension product is needed to be cloned.
extension product is needed to be cloned.

Storage: -20°C

* This product is not available in Canada

### 3G HotStart Taq DNA Polymerase (5U/ul)
(Supplied with 10 x reaction buffer and 25mM magnesium sulfate)

3G HotStart Taq DNA Polymerase includes recombinant Taq DNA Polymerase and a kind of primer matching factor (PMF) for automatic hot start PCR. It is a new generation of hot start DNA polymerase, features PMF keeping primers free at ambient temperature and catalyzing the oligos binding precisely to DNA templates at annealing temperature. In contrast to chemically modified or antibody based hot start DNA polymerase, 3G HotStart Taq DNA polymerase promotes accurate primer-template annealing and prevents mispriming at each PCR cycle, which guarantees the least dimmer and non-specific products formation.

**Advantages:**
- Increased specificity;
- Prevents the formation of primer dimmers;
- Reaction can be setup at ambient temperature;
- Robust yields with minimal optimization;
- Incorporate dUTP and dITP;
- Excellent performance in multiplex PCR;
- Hot start does not require extra activation step

**Unit Definition:** One unit is defined as the amount of enzyme required to incorporate 10 nmoles of dNTP into acid-insoluble material in 30 min at 74°C.

**Quality Assurance:** No detected endonuclease, exonuclease and nicking activities

**Storage Buffer:** 50mM Tris-HCl (pH 8.0), 100mM NaCl, 0.1mM EDTA, 5mM DTT, 50% glycerol and 1.0% Triton7X-100.

**10X Reaction Buffer:** 200mM Tris-HCl (pH 8.4), 200mM KCl, 25mM MgCl2 supplied separately.

**Magnesium Chloride:** 25mM MgCl2. The final magnesium chloride concentration may be variable according to individual requirements. In general, 1.5mM MgCl2 is recommended.

**Storage:** -20°C

<table>
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<tr>
<td>3GHST81</td>
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</tr>
<tr>
<td>3GHST81</td>
<td>5x500 U</td>
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### Tsg DNA Polymerase (5 u/ul)
(Supplied with 10×reaction buffer and 20mM magnesium sulfate)

Tsg DNA Polymerase is a thermostable DNA Polymerase isolated from a strain of Thermus sp. Tsg has a half life of 3 hours at 95°C, and is therefore more stable than Taq DNA Polymerase. Tsg has high fidelity with an error frequency 10/106 (or 0.01/103) during DNA synthesis. Taq is designed for use in primer extension reaction. Tsg can also be used for sequencing. DNA sequencing at high temperature may decrease the secondary structure of some DNA templates and permit polymerization through base-paired region. DNA sequencing with Tsg DNA Polymerase produces uniform bands intensities and low background. Tsg DNA Polymerase is highly purified free of contaminating endonucleases, exonucleases and nicking activity. For endonuclease assay, 1ug of Lambda / Hind III DNA is incubated with 20 units of the enzyme in assay buffer at 75°C for 16 hrs and no visible contaminating activity is observed; For exonucleases assay, 1ug of pBR322 plasmid DNA is incubated with 10 units of enzyme for 16 hrs at 75°C in assay buffer and no detectable exonuclease is observed. The purity of the enzyme is also evaluated by adding 10 units of Tsg DNA Polymerase in 100ul of a reaction mixture for making first strand cDNA at beginning and no impaired effect on the first strand is observed.

**Unit Definition:** One unit incorporates 10nmole of dNTP into acid-insoluble material in 30 min. at 74°C.

**Concentration in Storage Buffer:** 5 units/ul in 100mM KCl, 20mM Tris HCl ( pH 8.0, 22°C ), 0.1mM EDTA, 0.5mM PMSF, 1mM DTT, 50% glycerol.

**10×Tsg Reaction Buffer:** (New!) 100mM KCl, 100mM (NH₄)₂SO₄, 200mM Tris HCl (pH 8.75) at 22°C, 1% Triton X-100 and 1mg/ml BSA. Buffer is optimized for use with 200uM dNTPs.

**Magnesium Sulfate:** (New!) 20mM MgSO₄. The final magnesium sulfate may be variable according to individual requirements. In general, 2mM MgSO₄ is recommended.

** Primer Extension Characteristics:** Tsg has the independent terminal transferase activity which results in the addition of a single nucleotide (adenosine) at 3’ end of the extension product. TA cloning vector is recommended if the extension product is needed to be cloned.
Storage: -20°C.
## A-2 High Fidelity PCR

**Pfu DNA Polymerase** *(5 u/ul)*
*(Supplied with 10×reaction buffer)*

<table>
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<tbody>
<tr>
<td>B0093-100U</td>
<td>100U</td>
</tr>
<tr>
<td>B0093-5x100U</td>
<td>5x100U</td>
</tr>
</tbody>
</table>

* This product is not available in the US, Europe and Japan.

**Pfu DNA polymerase** is isolated from the Pyrococcus furiosus. The multi-functional thermostable enzyme possesses both of 5’ to 3’ DNA polymerase and 3’- to 5’- exonuclease activity, which results in a 12-fold increase in fidelity of DNA synthesis over Taq DNA polymerase. Pfu DNA polymerase has a temperature optimum between 72°C and 78°C and remains more than 95% active following one hour incubation at 95°C.

**Primer Extension Characteristics:**
As Pfu DNA Polymerase possesses both of 5’ to 3’ – DNA polymerase and 3’- to 5’- exonuclease activity, it results in blunt ends of DNA synthesis.

**Unit Definition:**
One unit incorporates 10nmol of dNTP into acid-insoluble material within 30 min at 72°C.

**Concentration in Storage Buffer:**
5 units /ul in 50mM Tris HCl (pH8.2), 0.1mMEDTA, 1mM DTT, 0.1% Tween 20, 0.1% Nonidet P-40 and 50% glycerol (v/v)

**10×Reaction Buffer:**
200mM TrisHCl (pH 8.8), 100mM KCl, 100mM (NH4)2SO4, 20mM MgSO4, 1% Triton X-100, and 1mg/ml nuclease-free bovine serum albumin

**Stability:**
Pfu DNA Polymerase is stable within twelve months after receiving

**Storage:**
-20°C

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## A-3 Long Range PCR

**Taq Plus DNA Polymerase** *(5 u/ul)*
*(Supplied with 10×reaction buffer)*

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>D0090-200U</td>
<td>200U</td>
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<tr>
<td>D0090-5×200U</td>
<td>5×200U</td>
</tr>
</tbody>
</table>

**Taq Plus** is a mixture of Taq and Pfu. Taq is a thermostable DNA polymerase isolated from a strain of Thermus sp (see product number B0089). **Taq Plus** is used to improve reliability and yield of conventional primer extension reaction. **Taq Plus** has two following advantages over **Taq Plus**: high fidelity with an error frequency 1.6/10^6 (or 0.0016/10^3) during DNA synthesis. **Taq Plus** increases the efficiency of polymerization reaction, resulting in a great percentage of extension reaction completion up to 10 kb to 30 kb. **Pfu** has a temperature optimum between 72-78°C and remains > 95% active following 1-hour incubation at 95°C.

**Concentration:**
1ul contains pfu and 5 units Taq DNA Polymerase

**10×Taq Plus reaction buffer:**
200mM TrisHCl (pH 8.8),100mM KCl,100mM (NH4)2SO4,20mM Mg SO4, 1% Triton X-100,1 mg /ml bovine serum albumin ( BSA )

**Reaction Conditions:**
Note: All reagents, including Taq Plus, should be mixed immediately before use.
DNA synthesis is performed in 100ul of mixture containing 20-200uM dNTPs. 0.3-1 uM Primers, 0.1- 0.25 ng of template DNA, 10ul of 10×reaction buffer and 2.5-5 units of Tsg Plus. Mix the reaction gently, centrifuge briefly and then overlay with light mineral oil. Initially, denature the reaction by incubating at 95°C for 5 minutes and then cool to 40-68°C for 5 minutes to allow the primers to anneal to the template DNA.

It is important to add the reaction components in the following order:
1. H2O
2. 10×reaction buffer
3. dNTPs
4. DNA template and primers
5. Tsg Plus

**Optimization of DNA synthesis:**

**Storage:**
-20°C
**Tsg Plus DNA Polymerase** (5 u/ul)  
(Supplied with 10×Reaction Buffer)

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
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<tbody>
<tr>
<td>D0088-200U</td>
<td>200U</td>
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<tr>
<td>D0088-5×200U</td>
<td>5×200U</td>
</tr>
</tbody>
</table>

Store: -20°C

*Tsg Plus* is a mixture of *Tsg* and *Pfu*. *Tsg* is a thermostable DNA polymerase isolated from a strain of Thermus sp (see product number D0081). *Tsg Plus* is used to improve reliability and yield of conventional primer extension reaction. *Tsg Plus* has two following advantages over *Taq Plus*: high fidelity with an error frequency $1.6 \times 10^{-6}$ (or 0.0016/10⁶) during DNA synthesis. *Tsg Plus* increases the efficiency of polymerization reaction, resulting in a great percentage of extension reaction completion up to 10 kb to 30 kb. *Pfu* has a temperature optimum between 72-78°C and remains > 95% active following 1-hour incubation at 95°C.

**Concentration:** 1 ul contains pfu and 5 units Tsg DNA Polymerase

**10×Tsg Plus reaction buffer:** 
- 200mM Tris HCl (pH 8.8), 100mM KCl, 100mM (NH₄)₂ SO₄, 20mM Mg SO₄, 1% Triton X-100, 1 mg/ml bovine serum albumin (BSA)

**Reaction Conditions:**
- DNA synthesis is performed in 100ul of mixture containing 20-200uM dNTPs, 0.3-1 uM Primers, 0.1-0.25 ng of template DNA, 10ul of 10×reaction buffer and 2.5-5 units of Tsg Plus. Mix the reaction gently, centrifuge briefly and then overlay with light mineral oil. Initially, denature the reaction by incubating at 95°C for 5 minutes and then cool to 40-68°C for 5 minutes to allow the primers to anneal to the template DNA.
- It is important to add the reaction components in the following order:
  1. H₂O
  2. 10×reaction buffer
  3. dNTPs
  4. DNA template and primers
  5. Tsg Plus

**Storage:** -20°C

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**A-4 RT-PCR (Reverse Transcription)**

**AMV Reverse Transcriptase** (10 u/ul)  
(Supplied with 5×incubation buffer)

<table>
<thead>
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<th>Code</th>
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<tbody>
<tr>
<td>B0999</td>
<td>200U</td>
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<td>B0999</td>
<td>1000U</td>
</tr>
</tbody>
</table>

Store: -20°C

**Source:** Avian Myeloblastosis Virus particles  
**UnitDefinition:** One unit of the enzyme is the amount required to catalyze the incorporation of 1nmol of dTTP into acid-insoluble form in 10 minutes at 37°C in a buffer containing: 50mM Tris, pH 8.3, 7mM MgCl₂, 40mM KCl, 1mM DTT, 0.1mg/ml BSA, 0.5M radiolabeled dTTP, 35ug/ml rA₄₀₀:dT₅₀  
**IncubationBuffer:** 50mM Tris, pH 8.3, 10mM MgCl₂, 50mM KCl, 0.5mM Spermidine, 10mM DTT  
**Storage Buffer:** 100mM KPO₄, pH 7.2, 2mM DTT, 0.2% Triton X-100 and 50% Glycerol  
**Concentration:** 10U/ul  
**Purity of the enzyme:** >95%  
**Function:** Autoradiographic analysis of synthesized 1.2Kb cDNA  
**DNase activity:** <1%  
**RNase activity:** <3%  
**Storage:** -20°C

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**M-MuLV Reverse Transcriptase** (200U/ul)  
(Supplied with 5×Reaction Buffer)

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1552</td>
<td>2000U</td>
</tr>
<tr>
<td>B1553</td>
<td>10,000U</td>
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</tbody>
</table>

Purified from an E.coli strain carrying a Moloney Murine Leukemia Virus (M-MuLV) reverse transcriptase overproducing plasmid. M-MuLV is an RNA and DNA dependent DNA polymerase. The enzyme exhibits 3' to 5' exonuclease activity AND RNase H activity, catalyzes 5' to 3' synthesis of DNA. No detectable DNase and RNase contamination.
Unit Definition: 1 unit of enzyme catalyzes the incorporation of 1nmole of dTTP into acid-insoluble form in 10 min at 37°C using poly(A) oligo(dT) as the template primer

Reaction Buffer: 50mM Tris-HCl (pH8.3), 75mM KCl, 3mM MgCl₂, 10mM DTT
Storage Buffer: 50mM Tris-HCl (pH 8.3), 1mM EDTA, 0.1mM DTT, 0.1% NP-40, 0.1mM NaCl and 50% glycerol
Concentration: 200U/µl
Source: Purified from an *E. coli* strain expressing a recombinant clone

One Step AMV RT-PCR Kit
(AMV Single Step RT-PCR Kit)
The kit is designed to perform the reverse transcription of RNA to cDNA using AMV (Avian Myeloblastosis Virus) Reverse Transcriptase. The kit minimizes the risk of contamination and allows simple and efficient analysis of RNA. The kit contains three components (1) 100ul of AMV RT/ Taq Mix (2) 5x0.5ml of 2xRT-PCR buffer (3) 1ml of 5mM MgSO₄.

Code | Size
--- | ---
BS6649 | 100 prep

One Step M-MuLV RT-PCR Kit
(M-MuLV Single Step RT-PCR Kit)
Description:
The kit is designed to perform the reverse transcription of RNA to cDNA using M-MuLV- Reverse Transcriptase. The kit minimizes the risk of contamination and allows simple and efficient analysis of RNA. M-MuLV Reverse Transcriptase (RT) is an RNA- and DNA-dependent DNA polymerase. It can use either RNA or DNA to prime DNA synthesis. The enzyme possesses a ribonuclease H activity specific to RNA in RNA-DNA hybrids The kit contains three components (1) 100ul of M-MuLV-RT / Taq Mix (dNTPs, primers) (2) 5x0.5ml of 2xRT-PCR buffer (3) 1ml of 5mM MgSO₄.

Code | Size
--- | ---
BS665 | 100 prep

A-5 PCR Cloning & Related Products

pUCm-T Cloning Vector (T-vector)
Designed for directly cloning PCR products with an overhang A residue at 3’ ends produced by Taq DNA polymerase, or other polymerases. The DNA sequence of pUCM-T vector are same as pUC19 (GenBank Accession Number M77789) except for minor differences at multiple cloning site. For the blunt ended DNA fragments, The vector can also be used for loning the blument-ended DNA fragments which is needed to be added an A-residue at 3’ end by using A-Tailing Kit (BS514) before cloning. The procedure is simple & fast. 1μg of the pUCM-T Cloning Vector is used for 20 reactions. Store at -20 °C

<table>
<thead>
<tr>
<th>Item No.</th>
<th>NAME</th>
<th>Size</th>
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<tbody>
<tr>
<td>BS433</td>
<td>pUCm-T-Cloning Vector (Clone-EZ Agents B)</td>
<td>1μg</td>
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<tr>
<td>BS434</td>
<td>pUCm-T-Cloning Vector (Clone-EZ Agents B)</td>
<td>5μg</td>
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Related Products:

<table>
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<th>Size</th>
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</thead>
<tbody>
<tr>
<td>BS243</td>
<td>Blunting &amp; Ligation Kit</td>
<td>10 preps</td>
</tr>
<tr>
<td>Store: -20 °C</td>
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</tr>
</tbody>
</table>

The kit provides a fast and convenient method for preparing sheared, nebulized or restriction enzyme-digested DNA for blunt-ended ligation into a plasmid, cosmid, fosmid or BAC vector. Components (1) Klenow DNA polymerase (3U/µl)1 5ul (2) 10×Klenow Reaction Buffer 100ul (3) dNTP Mix 20ul (4) T4 DNA Ligase (2U/µl) 20ul (5) 10×Ligation Buffer 100ul (6) PEG4000 Solution (50%) 300ul (7) sterile dd-water 1.5ml

<table>
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<tbody>
<tr>
<td>BS513</td>
<td>A-Tailing Kit</td>
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<tr>
<td>BS514</td>
<td>A-Tailing Kit</td>
<td>100 preps</td>
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<tr>
<td>Store: -20 °C</td>
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</tbody>
</table>

Designed to add single A residue to blunt-ended of PCR fragments or any other double-stranded DNA fragments. The resulting PCR fragments or any other double-stranded DNA fragments with added A can be cloned into a T-vector. Simple mix 100ng of blunt-ended DNA fragment sample with, 5ul of 10 x A-Tailing Buffer, 1ul dATP and 5 units of Tag DNA polymerase, incubate at 72 °C for 5-10 minutes. DNA fragment with additional A residue at 3’ end can be cleaned up by using Spin Column PCR products Purification Kit. (BS363), or directly be cloned into a T-Vector. The kit is sufficient for 100 X 100ng of DNA samples.

<table>
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<tbody>
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<td>BS71217</td>
<td>T-Tailing Kit</td>
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<tr>
<td>Store: -20 °C</td>
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</tbody>
</table>

Designed to add single T residue to blunt-ended of PCR fragments or any other double-stranded DNA fragments.
PCR Related Products & DNA, RNA Modifying Enzymes

### PCR Products

- **Single Step Ultra Competent Cell Preps Kit**
  - **BS523**
  - **BS524**
  - **Store:** -20°C
  - **Description:** SSCS has been reported to be faster and easier than other methods of producing competent cells. Suitable for fast and efficient preparation of competent E. coli cells in a single step. A typical transformation efficiency is 10^7–10^8 transformants/µg DNA. SSCS is compatible with E. coli strains DH1, DH5a, HB101, JM109, LE392, MM294, SC8-1, XL1-blue and Bacillus subtilis. Stable at -70°C with little or no loss in transformation efficiency. Usage: 1ml of SSCS solution is used for 1ml of cells at A600 = 0.5–0.7.

- **Direct Transformation Agent**
  - **BS62212**
  - **Store:** -20°C
  - **Description:** A New Concept in bacteria transformation. No competent cell preparation, no overnight culture, no heat shock, no -70°C freezer, and no dry ice for transportation is required. Procedure:
    1. Place a couple colonies from the Petri dish, or 50ul liquid bacteria in glycerol stock or 100ul of the fresh or the old cells to 1.5ml microtube, incubate at 37°C for 1 hour
    2. Spin for 1 minute at 10,000 g to pellet the cells, then add 50ul of Direct Transformation Agent solution and 1-10ul (1-10ng) of the ligation mixture (or DNA vector) to the cells, mix well, keep at -20°C for 5 minutes, then on ice for another 5 minutes.
    3. Add 1ml LB or other cell culture to the mixture, incubate at 37°C for 1 hour.
    4. Withdraw 0.1-0.3ml and plate immediately on pre-warmed LB-agar plates containing an appropriate antibiotic. Incubate overnight at 37°C. The rest mixture can be stored at -20°C, is stable for 6 months for re-transformation. The method is compatible with most common E. coli strains and DNA vectors. Typical transformation efficiency is more than 10^6-10^7 transformants per µg of supercoil pUC19 DNA. A plasmid pGEM3 is supplied as positive control. 1ml of Direct Transformation Agent is sufficient for 20-40 transformations. Direct Transformation Agent is stable for 1 year at -20°C.

### DNA/RNA Modifying Enzymes

- **T4 DNA Ligase (5 U/µl)**
  - **Supplied with 10×Reaction Buffer (Ligation Buffer)**
  - **T4 DNA Ligase** catalyzes the formation of a phosphodiester bond between juxtaposed 5’-phosphate and 3’-hydroxyl termini in duplex DNA or RNA. The enzyme repairs single-strand nicks in duplex DNA, RNA or DNA/RNA hybrids, joins DNA fragments with either cohesive or blunt termini, but has no activity on single-stranded nucleic acids. The T4 DNA Ligase requires ATP as cofactor.
  - **T4 DNA Ligase** is inactivated by heating at 65°C for 10 min or 70°C for 5 min.
  - **Unit Definition:** 1 unit (Weiss unit) of enzyme catalyzes the conversion of 1nmole of 32PPi into Norit-adsorbable form in 20 minutes at 37°C.
  - **Reaction Buffer:** 50mM Tris-HCl (pH 7.8), 10mM MgCl2, 10mM DTT, 1mM ATP and 25ug/ml BSA
  - **Storage Buffer:** 20mM Tris-HCl (pH 7.5), 50mM KCl, 10mM 2-Mecaptoethanol, 1mM EDTA and 50% glycerol
  - **Note:** One Weiss Unit is equivalent to approximately 200 cohesive-end ligation unit.
  - **Code** | **Size**
  - B1125 | 200U
  - B1122 | 1000U

- **T4 DNA Ligase (with PEG) (3 U/µl)**
  - **Supplied with 10×Reaction Buffer and 50% PEG Solution**
  - **T4 DNA Ligase** with PEG is suitable for efficient blunt-end ligation.
  - **Reaction Buffer:** 50mM Tris-HCl (pH 7.8), 10mM MgCl2, 10mM DTT, 1mM ATP and 25ug/ml BSA
  - **50% PEG Solution:** 50% (w/v) polyethylene glycol 4000
  - **Code** | **Size**
  - B1445 | 200U
  - B1442 | 1000U
  - **Storage:** -20°C

### Fast DNA Ligation Kit (5 Minutes Ligation)

The Fast DNA Ligation Kit enables simple sticky or blunt-ended DNA ligation in only 5 minutes at room temperature. The kit contains T4 DNA ligase and a specially formulated 5×Fast Ligation Buffer that has been optimized for fast and efficient ligation. 8 units of fast DNA ligase is used for one ligation reaction in 10-20ul.

- **Code** | **Size**
PCR Related Products & DNA, RNA Modifying Enzymes

T4 RNA Ligase (10-20U/ul)
Supplied with 10X reaction buffer
The enzyme catalyzes ligation of a 5'-phosphoryl-terminated nucleic acid (donor) and a 3'-hydroxyl terminated nucleic acid (acceptor) through the formation of a 3' 5' phosphodiester bond, with the hydrolysis of ATP to AMP and Ppi. T4 RNA ligase is ATP-dependent and is active on RNA, DNA, oligonucleotides, oligodeoxyribonucleotides, and several nucleotide derivatives.

Applications: T4 RNA ligase is used for RNA 3'-end labeling; Ligation of RNA to RNA; Oligodeoxyribonucleotide ligation to single-stranded cDNAs for 5' RACE (Rapid Amplification of cDNA Ends) and Mutagenesis of RNA.

Unit definition: One unit of the enzyme catalyzes the conversion of 1nmol of 5'-[32P]-[A]12-18 to a phosphatase-resistant form in 30 minutes at 37°C

Storage Buffer: Supplied in 50% glycerol, 10mM Tris-HCl (pH 7.5), 1mM DTT, 100mM NaCl, 0.1mM EDTA and, 0.1% Triton X-100.
10X Reaction Buffer: 330mM Tris-acetate (pH 7.8), 660mM potassium acetate, 100mM magnesium acetate, and 5mM DTT.

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEL0021</td>
<td>1,000U</td>
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B-2 Phosphatases and Kinase

Phosphatases

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<th>Size</th>
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</tr>
</thead>
<tbody>
<tr>
<td>AZ140A</td>
<td>Alkaline phosphatase AP &gt;4500U/mg Freeze-dried powder from Calf Intestine. Conjugation Grade. Specific activity: approx 4500 U/mg Soluble in water or dilution buffer.</td>
<td>5 KU</td>
</tr>
<tr>
<td>AZ140C</td>
<td>Alkaline phosphatase AP &gt;4500U/mg 50% Glycerol Solution from Calf Intestine. Conjugation Grade. Specific activity approx 4500 U/mg Soluble in water or dilution buffer</td>
<td>5 KU</td>
</tr>
<tr>
<td>AZ140B</td>
<td>Alkaline phosphatase AP &gt;4500U/mg Ammonium sulfate suspension from Calf Intestine. Conjugation Grade. Specific activity: approx 4500 U/mg Soluble in water or dilution buffer</td>
<td>5 KU</td>
</tr>
<tr>
<td>AZ235A</td>
<td>Alkaline phosphatase AP &gt;4500U/mg Freeze-dried powder from Calf Intestine. Molecular Biology Grade. Specific activity: approx 4500 U/mg Soluble in water or dilution buffer, Free of endonuclease, exonuclease and RNase activities</td>
<td>5 KU</td>
</tr>
<tr>
<td>AZ235C</td>
<td>Alkaline phosphatase AP &gt;4500U/mg 50% Glycerol Solution from Calf Intestine. Molecular Biology Grade Specific activity: approx 4500 U/mg Soluble in water or dilution buffer, Free of endonuclease, exonuclease and RNase activities</td>
<td>5 KU</td>
</tr>
<tr>
<td>AZ235B</td>
<td>Alkaline phosphatase AP &gt;4500U/mg Ammonium sulfate suspension from Calf Intestine. Molecular Biology Grade Specific activity: approx 4500 U/mg Soluble in water or dilution buffer, Free of endonuclease, exonuclease and RNase activities</td>
<td>5 KU</td>
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</table>

B-3 Thermophilic DNA Polymerases

<table>
<thead>
<tr>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>BDP0041</td>
<td>500U</td>
<td>10 reaction</td>
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</tbody>
</table>

B-4 Mesophilic DNA Polymerases

DNA Polymerase I (10U/ul)
DNA Polymerase I is a DNA-dependent DNA polymerase enzyme that catalyzes 5' -> 3' synthesis of DNA and exhibits 3' -> 5' exonuclease proofreading activity. 5' -> 3' exonuclease activity mediates nick translation during DNA repair. The enzyme is inactivated by heating at 75°C for 10 min or by addition of EDTA.

Applications: (1) Nick translation of DNA in making probes. (2) Second-strand synthesis of cDNA .

Unit definition: One unit of enzyme required to catalyze the conversion of 10nmol of dNTPs into an acid-insoluble form in 30 min at 37°C using activated DNA as the template-primer.

Storage Buffer: Supplied in 50% glycerol, 50mM Tris-HCl (pH 7.5), 0.1mM EDTA, 1mM DTT, 50.1mM NaCl, 0.1% Triton X-100. 10X Reaction Buffer: 500mM Tris-HCl (pH 7.5 at 25°C), 100mM MgCl2, 10mM DTT.

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>BDP0041</td>
<td>500U</td>
</tr>
</tbody>
</table>
**phi29 DNA Polymerase (10U/μl)**

phi29 DNA Polymerase is an enzyme that assists in DNA replication. It has exceptional strand displacement and processive synthesis properties with an inherent 3'->5' proofreading exonuclease activity. It is from E.coli cells with a cloned gene 2 of Bacillus subtilis phage phi29 (F29).

**Applications:** (1) Rolling circle amplification/replication (RCA/RCR). (2) Multiple displacement amplification (MDA). (3) Unbiased amplification of whole genome. (4) DNA template preparation for sequencing. (5) Protein-primed DNA amplification. (6) In situ genotyping with padlock probes.

**Unit definition:** One unit of the enzyme catalyzes the incorporation of 0.5 pmol of dCMP into a polynucleotide fraction (adsorbed on DE-81) in 10 min at 30°C.

**Storage Buffer:** Supplied in 50mM Tris-HCl (pH 7.5), 0.1mM EDTA, 1mM DTT, 100mM KCl, 0.5% (v/v) Nonidet P40, 0.5% (v/v) Tween-20 and 50% (v/v) glycerol.

**10X Reaction Buffer:** 330mM Tris-acetate (pH 7.9), 100mM Mg-acetate, 660mM K-acetate, 1% (v/v) Tween 20, 10mM DTT.

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
<td>BEP0091</td>
<td>250U</td>
</tr>
<tr>
<td>BEP0092</td>
<td>1000U</td>
</tr>
</tbody>
</table>

**T4 DNA Polymerase (5U/μl)**

A template dependent enzyme with 5'-> 3’ polymerase activity and 3'-> 5’ exonuclease activity. Unlike DNA Polymerase I, T4 DNA Polymerase has much greater 3'-> 5’ exonuclease activity, and no 5’-> 3’ exonuclease function.

**Applications:** (1) Used to label DNA termini with protruding 5’ ends (fill-in reaction). (2) Removal of 3'-A overhangs to form blunt-ends. (3) Labeling the 3’-termini of DNA molecules with flush or protruding ends (exchange reaction). (4) Oligonucleotide-directed site-specific mutagenesis.

**Unit definition:** One unit of the enzyme converts 10nmol of dNTP into acid-insoluble material in 30 min at 37°C under standard assay conditions.

**Storage Buffer:** Supplied in 50% glycerol, 50mM Tris-HCl (pH 7.5), 0.1M NaCl, 1mM DTT, 0.1mM EDTA, and 0.1% Triton X-100.

**5× Reaction Buffer:** 335mM Tris-HCl (pH 8.8 at 25°C), 33mM MgCl2, 5mM DTT, 84mM (NH4)2SO4

<table>
<thead>
<tr>
<th>Code</th>
<th>Size</th>
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</thead>
<tbody>
<tr>
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</table>

**AMV Reverse Transcriptase (B0999) see RT-PCR**

**M-MuLV Reverse Transcriptase (B1552) see RT-PCR**

**T7 RNA Polymerase (10U/μl)**

T7 RNA Polymerase is a DNA-dependent RNA polymerase that catalyzes the formation of RNA in the 5’ to 3’ direction. It is extremely promoter-specific and only transcribes bacteriophage T7 DNA or DNA cloned downstream of a T7 promoter. Its source is the T7 bacteriophage, which is a virus that infects only bacteria.

**Applications:** (1) Radiolabeled RNA probe preparation. (2) RNA generation for in vitro translation. (3) Expression control via antisense RNA.

**Unit definition:** One unit of the enzyme incorporates 1 nmol of AMP into a polynucleotide fraction (adsorbed on DE-81) in 60 minutes at 37°C.

**Storage Buffer:** Supplied in 50mM Tris-HCl (pH 8.0), 150mM NaCl, 5mM DTT, 0.1 mg/ml BSA, 0.03% (v/v) ELUGENT Detergent, 50% (v/v) glycerol.

**5X Reaction Buffer:** 200mM Tris-HCl (pH 7.9 at 25°C), 30mM MgCl2, 50mM DTT, 84mM (NH4)2SO4, 10mM spermidine.

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**RNase Inhibitor & RNase-Be- Gon**

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<tr>
<td>RBO478</td>
<td>1 KU</td>
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<td></td>
<td>5 KU</td>
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**DNAase & RNase Away Solution**

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<tr>
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<th>Size</th>
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<tbody>
<tr>
<td>DB0339</td>
<td>200ml</td>
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</tbody>
</table>

**Storage:** -20°C
25°C removing nuclease and DNA contamination from bench tops, instruments, pipettes, glass and plastic ware. Ideal for labware and surfaces that cannot be autoclaved. Ready to use right out of the bottle, these solutions leave no residue on work surfaces when used as directed.

| RT4201 DNase & RNase-Be-Gone B | 50ml  
| Storage: 18-25°C | 5x50ml |

Features: (1) Effectively inactivate up to 100ug surface-contaminated RNases such as RNase T1, RNase H, BAL31, S1, Mung bean nuclease etc. and DNases in 10 minutes. (2) Faster than using DEPC. (3) Non-toxic (4) Economical. (5) Simple. Simply dilute RNase-Be-Gone B solution with water in a ratio of 1:1000 (v/v) and wash surfaces of glasswares, plasticwares and instruments and keep for 10 minutes at room temperature. (6) Can be used for making RNase-free water. (For making RNase-free water add 1% of RNase-Be-Gone B solution to dd-water and keep for 24 hours or longer at room temperature. Stability: stable at RT for 2 years.

B-8 Nuclease (DNases, RNases)

**DNase I (Deoxyribonuclease I)**
From Bovine Pancreas, is an endonuclease that digests single- and double-stranded DNA. It hydrolyzes phosphodiester bonds producing oligodeoxyribonucleotides with 5’-phosphate and 3’-OH groups. Highly purified by chromatography.

Activity >500 Kunitz U/mg Residue on ignition <1%, 100mg equals 50KU

**Unit Definition:** One Kunitz unit will produce a A$_{260}$ of 0.001 per minute at pH 5.0 at 25°C using DNA, type I or III as substrate. Purity of the protein >90%. RNase: essentially free.

**Code** **Size**
DD0099 250mg  
1 g  
5 g

**Storage: -20°C**

**Endonuclease IV, E. coli (2U/ul)**
Endonuclease IV is a class II apurinic/apyrimidic (AP) enzyme that cleaves 5’ to an AP site by hydrolysis leaving a hydroxyl group at the 3’ terminus and a deoxyribose 5’-phosphate at the 5’ terminus. Endo IV can be used in vivo to repair free radical damage in DNA.

**Applications:** (1) DNA damage and repair. (2) Single cell gel electrophoresis. (3) Anti-tumor drug studies. (4) SNP analysis.

**Unit Definition:** One unit of the enzyme relaxes 1µg of partially depurinated, covalently closed supercoiled plasmid DNA in 30 min at 37°C.

**Storage Buffer:** Supplied in 50% glycerol, 50mM Tris-HCl (pH 7.5), 1mM DTT, 0.1M NaCl, 0.1% Triton X-100.

**10×Reaction Buffer:** 500mM Tris-acetate (pH 7.5), 500mM KCl, 10mM EDTA, 0.5% (v/v) Triton X-100

**Code** **Size**
BEN0591 100U

**Store: -20°C**

**T4 Endonuclease V (5U/ul)**
T4 Endonuclease V also known as T4 PDG, the enzyme has DNA glycosylase and apurinic/apyrimidinic lyase (AP lyase) activity. The protein recognizes cis-syn- cyclobutane pyrimidine dimers caused by UV light. T4 Endonuclease V binds to pyrimidine dimers in double-stranded DNA, then cleaves the glycosyl bond of the 5’-pyrimidine dimer and cleaves the phosphodiester bond 3’ to the resting basic site.

**Applications:** (1) Used in Single cell gel electrophoresis. (2) Studies of DNA damage by UV. (3) Genotyping.

**Unit Definition:** One unit converts 1ug of UV irradiated supercoiled DNA to nicked plasma in 30 minutes at 37°C.

**Storage Buffer:** Supplied in 50% glycerol, 50mM Tris-HCl (pH 7.5), 0.1mM EDTA, 1mM DTT, 100mM NaCl, 0.1% Triton X-100.

**Code** **Size**
BEN0141 250U

**Store: -20°C**

**Lambda Exonuclease (10U/ul)**
Lambda Exonuclease is a processive 5’->3’ exodeoxyribonuclease. It digests the phosphorylated strand of double-stranded DNA. The enzyme will also degrade single-stranded DNA and non-phosphorylated DNA at a greatly reduced rate, and has no activity at nicks and limited activity at gaps in DNA.
**Applications:** (1) Generating single-stranded PCR products for use in DNA sequencing and analysis of DNA single-strand conformation polymorphism (SSCP). (2) Producing single-stranded DNA from double-stranded DNA fragments. (3) Cloning of PCR products.

**Unit Definition:** One unit of the enzyme catalyzes the release of 10 nmole of acid soluble reaction products from double-stranded substrate in 30 min at 37°C.

**Storage Buffer:** Supplied in 50% glycerol containing 50 mM Tris-HCl pH 8.0, 20 mM NaCl and 2 mM MgCl₂.

<table>
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<tbody>
<tr>
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Store: -20°C

**RNase A**

RNase A (Ribonuclease A) 60-120U/mg (Kunitz Unit)

<table>
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<th>Code</th>
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<tr>
<td>RB0473</td>
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<tr>
<td>(9001-99-4)</td>
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<tr>
<td>RB0474</td>
<td>500 mg</td>
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Storage: -20°C

**RNase H (5U/ul)**

RNase H is an endonuclease that hydrolyzes phosphodiester bonds of RNA in an RNA:DNA hybrid. It does not hydrolyze phosphodiester bonds in double-stranded DNA or single-stranded nucleic acids.

**Applications:** (1) Eliminates the RNA strand of the RNA/DNA duplex prior to second-strand synthesis of cDNA. (2) Removal of poly (A) tails on mRNA after hybridization with oligo dT. (3) Site-specific cleavage of RNA. (4) Destruction of hybrid-arrested mRNAs. (5) In vitro destruction of hybrid-arrested mRNAs during translation.

**Unit Definition:** One unit of the enzyme hydrolyzes 1 nmol of RNA to acid-soluble ribonucleotides in 20 min at 37°C.

**Storage Buffer:** 50% glycerol, 50 mM Tris-HCl (pH 7.5), 0.1 M NaCl, 0.1 mM EDTA, 1 mM DTT, 0.1% Triton x-100.

**10X Reaction Buffer:** 200 mM Tris-HCl (pH 7.8), 400 mM KCl, 80 mM MgCl₂, 10 mM DTT

<table>
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<tbody>
<tr>
<td>BEN0202</td>
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Store: -20°C

**RNase I, E. coli** (10U/ul)

RNase I (E. coli) catalyzes the hydrolysis of single-stranded RNA to nucleoside 3’-monophosphates via 2’, 3’ cyclic monophosphate intermediates. The enzyme is inactivated by heating at 70°C for 15 minutes.

**Applications:** (1) Remove RNA from DNA preparations. (2) Removal of RNA from recombinant protein preparations. (3) RNase protection assays.

**Unit Definition:** One unit of enzyme required to catalyze the degradation of 100 ng of E. coli ribosomal RNA per second into acid-soluble nucleotides at 37°C.

**Storage Buffer:** 50% glycerol, 50 mM Tris-HCl (pH 7.5), 100 mM NaCl, 0.01 mM EDTA.

<table>
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Store: -20°C

**B-9 Other Enzymes**

**Proteinase K**

Proteinase K Lyophilized from Trichirachium album Biotech Grade

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<tbody>
<tr>
<td>PB0451</td>
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Storage: -20°C (39450-01-6)

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<th>Size</th>
</tr>
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<tbody>
<tr>
<td>PB0451</td>
<td>250 mg</td>
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</table>

**Pyrophosphatase Inorganic from Yeast** (0.1U/ul)

Pyrophosphatase inorganicPyrophosphatase, Inorganic catalyzes the hydrolysis of inorganic pyrophosphate to two orthophosphates, see Fig. 1. The enzyme requires a divalent metal cation, with Mg²⁺ conferring the highest activity.

**Applications:** (1) High yield RNA synthesis by in vitro transcription. (2) DNA polymerization reactions: preventing accumulation of pyrophosphate. (3) Removal of contaminant PPi in reagents used for SNP genotyping by methods based on the detection of pyrophosphate

**Unit Definition:** One unit of the enzyme hydrolyzes 1 µmol of inorganic pyrophosphate in 1 min at 25°C. Enzyme activity is assayed in the following mixture: 100 mM Tris-HCl (pH 7.2), 2 mM MgCl₂ and 2 mM inorganic pyrophosphate (PPi).

**Storage Buffer:** in 20 mM Tris-HCl (pH 8.0), 100 mM KCl, 1 mM Dithiothreitol, 0.1 mM EDTA, 50% Glycerol.

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**Uracil-DNA Glycosylase (UDG)**

<table>
<thead>
<tr>
<th>BEF0221</th>
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<tbody>
<tr>
<td>Store: -20°C</td>
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</tbody>
</table>

**Uracil-DNA Glycosylase (UDG) (1U/ul)**

Supplied with 10× Reaction Buffer. Purified from E.coli strain K12. Catalyzes the hydrolysis of N-glycosyl bond between uracil and sugar, leaving an apyrimidinic site in uracil-containing single or double-stranded DNA. It shows no activity for RNA. Unit Definition: 1 unit of enzyme catalyzes the degradation of 1ug single-stranded uracil-containing DNA in 60 minutes at 37°C. Reaction Buffer: 20mM Tris-HCl (pH 8.0), 1mM EDTA and 1mM DTT. Storage Buffer: 20mM Tris-HCl (pH 8.0), 50mM NaCl, 7mM 2-Mercaptoethanol, 1mM EDTA and 50% glycerol.

**C. Primers**

**Random Primer**

| B0043 | Random Primer | 5’d(NNN NNN)3’ | 1.0 OD |
| B0043-9 | Random Primer | 5’d(NNN NNN NNN)3’ | 1.0 OD |
| B0043-10 | Random Primer | 5’d(NNN NNN NNN N)3’ | 1.0 OD |

**M13/pUC Sequencing Primers** (Purified by PAGE)

| B0010 | M13/pUC Sequencing Primer (-20) | 5’d(GTA AAA CGA CGG CCA GT)3’ | 1.0 OD |
| B0011 | M13/pUC Sequencing Primer (-40) | 5’d(GTT TTC CCA GTC ACG AC)3’ | 1.0 OD |
| B0012 | M13/pUC Sequencing Primer (-47) | 5’d(CGC CAG GGT TTT CCC AGT CAC GAC)3’ | 1.0 OD |
| B0013 | M13/pUC Reverse Sequencing Primer | 5’d(AAC AGC TAT GAC CAT GT)3’ | 1.0 OD |
| B0014 | M13/pUC Reverse Sequencing Primer (-48) | 5’d(AGC GGA TAA CAA TTT CAC ACA GGA)3’ | 1.0 OD |
| B0010 | M13/pUC Sequencing Primer (-20) | 5’d(GTA AAA CGA CGG CCA GT)3’ | 1.0 OD |
| B0011 | M13/pUC Sequencing Primer (-40) | 5’d(GTT TTC CCA GTC ACG AC)3’ | 1.0 OD |
| B0012 | M13/pUC Sequencing Primer (-47) | 5’d(CGC CAG GGT TTT CCC AGT CAC GAC)3’ | 1.0 OD |

**Oligo(dT) Primer** (Purified by PAGE)

| BP0191 | pJET1.2 forward sequence primer, 23-mer | 5’-d(CGACTCCTATAGGGAGAGC)-3’ | 1.0 OD |
| BP0192 | pJET1.2 reverse sequence primer, 24-mer | 5’-d(AAGAACATCGATTTCATGGC)-3’ | 1.0 OD |

**Transcription Promoter Sequencing Primers** (Purified by PAGE)

| B0044 | SP6 Promotor Primer | 5’d(CAT ACG ATT TAG GTG ACA CTA TAG)3’ | 1.0 OD |
| B0045 | T7 Promotor Primer | 5’d(TAA TAC GAG TCA CTA TAG GGC GA)3’ | 1.0 OD |
| B0046 | T3 Promotor Primer | 5’d(ATG TAC CATA CTA TGA AGG GA)3’ | 1.0 OD |

**D. Nucleotides**

<table>
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<tr>
<th>AB0311</th>
<th>ATP 100mM Solution</th>
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</thead>
<tbody>
<tr>
<td>Storage: -20°C</td>
<td></td>
</tr>
</tbody>
</table>

Adenosine 5’-triphosphate, disodium salt, trihydrate Molecular Biology Grade. C10H14O13N5P3Na2·3H2O MW 605.24 Purity >98%, Chloride <0.05%, Heavy metals <0.001%, RNase, DNase: non-detected.

CTP sec NTP (ND0056)

**dATP 100mM Solution**

Storage: -20°C

0.25ml

2’-Deoxyadenosine-5’-triphosphate, tetrasodium salt, trihydrate Molecular Biology Grade, C10H16N5O12P4Na4 MW 779.2 Purity >98% by HPLC, Heavy metals<0.001%, 100mM dATP, pH: 6.8-7.2, RNase,DNase: non-detected.

**dCTP 100mM Solution**

Storage: -20°C

0.5ml

2’-Deoxycytidine-5’-triphosphate, disodium salt, Molecular Biology Grade. Em: (280nm pH2.0): >12,400, Purity >98%, Heavy metals <0.001%, pH: 6.8-7.2, RNase,DNase: non-detected.

**DGTP 100mM Solution**

Storage: -20°C

0.5ml
**PCR Related Products & DNA, RNA Modifying Enzymes**

**DD0046T**
- **Product & Description**: dTTP 100mM Solution
- **Storage**: -20°C
- **Purity >98% (HPLC)**
- **Size**: 0.5ml
- **Description**: 2'-Deoxythymidine-5'-triphosphate, sodium salt Molecular Biology Grade
- **Specifications**: MW 547.1, Purity >98% (HPLC), Heavy metals <10 ppm, RNase, DNase: non-detected

**DM1244**
- **Product & Description**: dUTP 100mM Solution
- **Storage**: -20°C
- **Purity >98% (HPLC)**
- **Size**: 0.25ml
- **Description**: 2'-Deoxyuridine-5'-triphosphate Molecular Biology Grade
- **Specifications**: MW 468.14, Purity >98% (HPLC), Heavy metals <10 ppm, pH: 6.8-7.2, RNase, DNase: non-detected

**DD0056**
- **Product & Description**: dNTP mixture (10mM)
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 0.5ml
- **Description**: (dATP, dCTP, dGTP, dTTP each 10mM) pH 7.0

**DD0057**
- **Product & Description**: dNTP mixture (25mM)
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 0.5ml
- **Description**: (dATP, dCTP, dGTP, dTTP each 25mM) pH 7.0

**DD0058**
- **Product & Description**: dNTP/dUTP Mix Solution
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 1ml
- **Description**: (2mM dATP, 2mM dCTP, 2mM dGTP and 4mM dUTP (pH 7.0)

**ND0056**
- **Product & Description**: NTP Mixture Solution (10mM)
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 0.5ml
- **Description**: (ATP, CTP, GTP and UTP each 10mM) pH 7.0

**ND0057**
- **Product & Description**: NTP Mixture Solution (25mM)
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 0.5ml
- **Description**: (ATP, CTP, GTP and UTP each 25mM) pH 7.0

**DD0059**
- **Product & Description**: NTP Set Solutions (100mM each)
- **Storage**: -20°C
- **Purity >98.0% (HPLC)**
- **Size**: 4x0.25ml
- **Description**: ATP, CTP, GTP, TTP as separated solutions pH 6.8-7.2 , Purity of each >98.0% (HPLC), RNase, DNase: non-detected, Stable at-20°C for one year

**E. DNA, RNA-EZ Series Products**

Bio Basic Inc. has developed a couple dozens of unique products called as DNA, RNA-EZ series products which may be useful to increase efficiencies of PCR, Cloning, Removal of DNase or RNase, Protection of RNA & DNA and RNA DNA Purification.

<table>
<thead>
<tr>
<th>Code</th>
<th>Product &amp; Description</th>
<th>Size</th>
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<tbody>
<tr>
<td>BS409A</td>
<td>EZ-RNA Reagents</td>
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<tr>
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<td>SK8201</td>
<td>EZ-DNA Reagents</td>
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<tr>
<td>RT4732</td>
<td>DNA, RNA-EZ B1 (DNA-Be-Down) Solution</td>
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**Storage Specifications**

- **-20°C**: Suitable for long-term storage
- **2-8°C**: Suitable for short-term storage
- **18-25°C**: Suitable for room temperature storage
- **-20°C**: Suitable for long-term storage

**Additional Information**

- **B2211**: NTP Mixture Solution (100mM each)
- **ND0056**: NTP Mixture Solution (25mM each)
- **DD0059**: NTP Set Solutions (100mM each)
- **UTP see NTP (ND0056)**

**Contact Information**

- **Bio Basic Inc.**
  - 20 Konrad Crescent Markham Ontario L3R 8T4 Canada
  - Tel: 905-474-4493 Fax: 905-474-5794
  - Email: order@biobasic.com Web: www.biobasic.com

**Legal Information**

- **ISO 9001 Certified**

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**Additional Note**

- **Storage**: -20°C
- **Heavy metals**: <10 ppm
- **RNase, DNase**: non-detected
be added to diluted DNA solution, or to lysis & extraction buffer for DNA isolation. It is chemically inert, no UV absorbance at 250, 260 and 280 nm. Store: stable for two years at -20°C. 100ul can be used for 20 mini-preps.

<table>
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<tr>
<th>Product Code</th>
<th>Product Name</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>RT4231</td>
<td>DNA, RNA-EZ B3 (RNA-Be-Down) Solution</td>
<td>The RNA-Be-Down reagent is a molecular biology grade RNase-free solution designed for isolation of small amounts of RNA or increasing the yield of RNA. This product is particularly suitable for the extraction of small amounts of RNA or diluted RNA solution. The RNA-Be-Down reagent can directly be added to diluted RNA solution, or be added to lysis &amp; extraction buffer for RNA isolation. The RNA-Be-Down reagent is chemically inert, no UV absorbance at 250, 260 and 280 nm. 100ul can be used for 20 mini-preps. Store: at -20°C, stable for two years.</td>
</tr>
<tr>
<td>RT4171</td>
<td>DNA, RNA-EZ E1 (RNA-Be-Locked) Solution -tissue</td>
<td>RNA-Be-Locked A is an aqueous, nontoxic tissue storage reagent that immediately permeates tissues to stabilize and protect RNA in fresh specimens. Samples in RNA-Be-Locked A are safe and protected for up to 1 day at 37°C, 1 week at 25°C, 1 month or more at 4°C, and long term at -20°C or -80°C. Purified RNA can be used for most of downstream applications. 25ml of RNA-Be-Locked A can be used for 25 grams of tissue samples. Store: RT, valid for 2 years.</td>
</tr>
<tr>
<td>RT91712</td>
<td>DNA, RNA-EZ E2 (RNA-Be-Locked B) Solution -bacteria</td>
<td>RNA-Be-Locked B is an aqueous, nontoxic tissue storage reagent that immediately permeates bacteria cell to stabilize and protect RNA in fresh specimens. Purified RNA can be used for most of downstream applications. 25ml of RNA-Be-Locked B can be used for 125ml of bacterial culture. Store at 4°C, and valid for 2 year.</td>
</tr>
<tr>
<td>DT71718</td>
<td>DNA, RNA-EZ J1 (Endotoxin-Be-Gone) Solution</td>
<td>Designed for removing most Endotoxin in DNA and Protein Solutions. One treatment may remove &gt;90% of endotoxin. After three times treatments, endotoxin level could be down to 0.2EU/ML. Features: (1) Fast. It takes 20 minutes. (2) Simple: (3) Chemically inert, no side reactions to RNA, DNA and Proteins. 5ml is for 100 mini-preps.</td>
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<tr>
<td>DB0339</td>
<td>DNAase &amp; RNase Away Solution</td>
<td>Easy to use and safer than traditional alternatives such as DEPC. Ideal for removing nuclease and DNA contamination from bench tops, instruments, pipettors, glass and plastic ware. Ideal for labware and surfaces that cannot be autoclaved. Ready to use. These solutions leave no residue on work surfaces when used as directed.</td>
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<tr>
<td>EE4203</td>
<td>DNA, RNA-EZ P (EB-Be-Gone)</td>
<td>Two components solutions. DNA, RNA-EZ P, as non-toxic agent is designed to minimize the risk associated with the regular use of EB. DNA, RNA-EZ P may destroy &gt; 99% EB (ethidium bromode) in solutions, gels and surface of glasswares or plasticwares. Simply mix Solution A, Solution B and water in a ratio of 1:2:30 (v/v), the mixture is ready to use and is stable within 24 hours. The kit contains 100ml of Solution A and 200ml of Solution B, 3L of ready-to-use solution can be made. The kit is stable for 1 year at room temperature.</td>
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<tr>
<td>RT4201</td>
<td>DNA, RNA-EZ Q2 (DNase &amp; RNase-Be-Gone) Solution</td>
<td>1 X1000 Solution. Designed for removing &gt;80% surface-RNases. Features: (1) Effectively inactivate up to 100ug surface-contaminated RNases such as RNase T1, RNase H, BAL31, S1, Mung bean nuclease etc. and DNases in 10 minutes. (2) Faster than using DEPC. (3) Non-toxic (4) Economical. (5) Simple. Simply dilute RNase-Be-Gone B solution with water in a ratio of 1:1000 (v/v) and wash surfaces of glasswares, plasticwares and instruments and keep for 10 minutes at room temperature. (6) Can be used for making RNase-free water. For making RNase-free water add 1% of RNase-Be-Gone B solution to dd-water and keep for 24 hours or longer at room temperature. Stability: stable at RT for 2 years.</td>
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