

## Thermo Scientific Thermo-Start *Taq* DNA Polymerase

**Description:** Thermo-Start™ *Taq* DNA Polymerase is a chemically modified version of ThermoPrime *Taq* DNA Polymerase. It is completely inactive at room temperature, preventing the formation and subsequent amplification of non-specific products. The enzyme requires an **activation step at 95°C for 15 minutes**.

**Enzyme Source:** *Thermus aquaticus*

**Concentration:** 5 units/μl

**Unit Definition:** One unit of enzyme is defined as the amount that will incorporate 10nmoles of dNTPs into acid insoluble material in 30 minutes at 74°C under the analysis conditions below.

**Associated Activities:** Thermo-Start™ has 5' to 3' polymerization and exonuclease activity but lacks 3' to 5' exonuclease activity (proofreading).

**Storage Conditions:** Store Thermo-Start™ *Taq* DNA Polymerase at -20°C, in a constant temperature freezer for up to 12 months. Shipped on ice within the UK and on dry ice for international and within the US.

### Kit Contents

Vial	Pack Size (cap color)		
	A	B	C
Thermo-Start <i>Taq</i> DNA Pol.	1 x 50μl (clear)	10 x 50μl (clear)	100 x 50μl (clear)
Thermo-Start PCR Buffer	1 x 1.25ml (yellow)	10 x 1.25ml (yellow)	100 x 1.25ml (yellow)
MgCl <sub>2</sub>	1 x 1.5ml (clear)	10 x 1.5ml (clear)	100 x 1.5ml (clear)

**Example of Protocol:**

Mix and spin down the solutions prior to use

	Volume	Final Concentration 1X
Thermo-Start Taq DNA Pol. (5U/ $\mu$ l)	0.125 $\mu$ l	0.625 U
10X Thermo-Start PCR Buffer	2.5 $\mu$ l	1X
dNTP Mix (20mM)	1 $\mu$ l	0.2mM of each nucleotide
MgCl <sub>2</sub> (25mM)	1.5 $\mu$ l*	1.5mM*
Primer forward (10 $\mu$ M each)	1.25 $\mu$ l*	0.5 $\mu$ M*
Primer reverse (10 $\mu$ M each)	1.25 $\mu$ l*	0.5 $\mu$ M*
Water (PCR Grade)	variable	
DNA Template	0.5 - 10 $\mu$ l	0.5 - 125ng
Total Volume	25 $\mu$ l	

\*Scale up or down the volume and concentration as appropriate

Note: These recommendations are intended as basic guidelines. Magnesium chloride concentration and amount of enzyme should be optimized according to template and primer combination.

**Example of Program:**

	Temp.	Time	Number of cycle
<b>Initial Denaturation</b>	<b>95°C</b>	<b>15 min</b>	<b>1 cycle</b>
Denaturation	95°C	20 sec	30 to 40 cycles
Annealing	50-65°C	30 sec	
Extension**	72°C	60 sec	
Final Extension	72°C	5 min	1 cycle

\*\*Increase length of time in proportion to size of amplicon, Taq DNA Polymerase extends at approximately 1000 bp/min.

**Incremental Activation:**

For extra stringency, the enzyme can be activated gradually during the PCR in a series of steps. The initial activation step is replaced by longer (2 minutes) denaturation steps for the first 7–8 cycles of the reaction.

<b>Analysis Conditions:</b>	25mM	TAPS, pH 9.3 (at 25°C)
		[tris-(hydroxymethyl)-methyl-amino-propane sulfonic acid, sodium salt]
	50mM	KCl
	2mM	MgCl <sub>2</sub>
	1mM	β-mercaptoethanol
	200μM	of each: dATP, dGTP, dTTP
	100μM	[α <sup>32</sup> P]-dCTP (0.05 to 0.1 Ci/mmol)
	1.25μg/μl	activated salmon sperm DNA

Water added to a total volume of 50μl. Incubated at 74°C for 10 minutes. The enzyme is first treated with a 15 minute activation step at 95°C. The amount of incorporated dNTPs is determined by trichloroacetic acid precipitation.

<b>Storage Buffer:</b>	100mM	KCl
	20mM	Tris-HCl, pH 9.2 (at 25°C)
	0.1mM	EDTA (ethylenediaminetetraacetic acid)
	1mM	DTT (dithiothreitol)
	0.5%	Tween <sup>®</sup> 20
	0.5%	Nonidet <sup>®</sup> P40
	50% (v/v)	Glycerol

<b>Ordering Information:</b>	AB-0908/A	Thermo-Start <i>Taq</i> DNA Polymerase	250 units
	AB-0908/B	Thermo-Start <i>Taq</i> DNA Polymerase	10 x 250 units
	AB-0908/C	Thermo-Start <i>Taq</i> DNA Polymerase	100 x 250 units

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