

Description: DFS-Taq DNA Polymerase (DNA Free Sensitive) is a thermostable enzyme of approximately 94 kDa, isolated from eubacterium *Thermus aquaticus* strain YT-1. This unmodified enzyme replicates DNA at 72 °C. The enzyme catalyzes the polymerization of nucleotides into duplex DNA in the 5' → 3' direction in the presence of magnesium ions and shows 5' → 3' exonuclease activity. The enzyme is highly purified and free of nonspecific endo- or exonucleases. DFS-Taq DNA Polymerase leaves single 3'-A overhang nucleotides on their reaction products.

Content

Ref No.	S101005	101005	101025	101100	101500	color
DFS-Taq DNA Polymerase	Sample size	500 units	2500 units	10 000 units	50 000 units	Blue
Incomplete NH ₄ [*] Reaction Buffer (10x)	1,8 mL	1.8 mL	5x 1.8 mL	20x 1.8 mL	2x 40 mL	Red
Complete NH ₄ ^{**} Reaction Buffer (10x)	1,8 mL	1.8 mL	5x 1.8 mL	20x 1.8 mL	2x 40 mL	yellow
Complete KCl ^{***} Reaction Buffer (10x)	1,8 mL	1.8 mL	5x 1.8 mL	20x 1.8 mL	2x 40 mL	black
MgCl ₂ 100 mM	1 mL	1 mL	5x 1 mL	20x 1 mL	1x 40 mL	green
Datasheet	1	1	1	1	1	--

* Incomplete NH₄ Reaction Buffer (10x): pH 8.8, 0.1% Tween 20, free of MgCl₂.

** Complete NH₄ Reaction Buffer (10x): pH 8.8, 0.1% Tween 20, 25 mM MgCl₂.

*** Complete KCl Reaction Buffer (10x): pH 8.8, 0.1% Tween 20, 15 mM MgCl₂.

Applications: DFS-Taq DNA Polymerase is suitable for all regular applications - PCR, primer extension reactions etc. DFS-Taq is free of bacterial DNA and therefore suitable for detection of pathogen bacteria. DFS-Taq DNA Polymerase effectively directs PCR with templates up to 5 kb in length.

Concentration: 5 units/μL

Sensitivity: detection of ≥ 10 DNA molecules

Unit definition: One unit of activity is defined as the amount of enzyme required to incorporate 10 nmoles of dNTP into acid-insoluble DNA fraction in 30 minutes at 72 °C.

Additionally provided: 1 tube MgCl₂ (100 mM)

Recommended MgCl₂ concentration: 1.5 mM – 6 mM

Quality Control

- 98% protein homogeneity in 10% SDS-PAGE
- No detectable exo-/endonuclease activities
- PCR amplification tests with different templates
- PCR amplification tests without templates as Negative Control
- “no template” test with primers complementary to a region auf 16S bacterial ribosomal genes

Storage condition: -20 °C

Pipetting scheme and thermocycler protocol

Components	Volume / 50 μ L Reaction	Final concentration
10 x PCR-Buffer	5 μ L	1 x
dNTP-Mix (10 mM each)	1 μ L	200 μ M each
Upstream Primer	variable	0.1 - 0.5 μ M
Downstream Primer	variable	0.1 - 0.5 μ M
DFS-Taq DNA Polymerase	0.25 - 1.0 μ L	1.25 - 5.0 units
Template DNA	variable	10 to 500 ng/reaction
Sterile dest. water	Adjust to 50 μ L final volume	

Separate $MgCl_2$ solution can be used for optimization. If incomplete buffer is used **titrate $MgCl_2$** for optimal PCR results with following recommendation (see table):

Final $MgCl_2$ conc. [mM]	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Volume [μ L] of 100 mM $MgCl_2$ / 50 μ L	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3

Thermocycler protocol

step	time	temperature
initial denaturation	2 minutes	94 °C
30 cycles:		
denaturation	10 seconds	94 °C
annealing	20 seconds	55 - 68 °C *
extension	1 minute	72 °C

* Usually the optimal annealing temperature is 5 °C below the melting temperature of the primers.

Notes:

Program the cycler according to the manufacturer's instructions.

Each program should start with an initial denaturation step at 94 °C for 2 to max. 5 min.

Recommended elongation time: 1 min/ 1 kb of target.

For maximum yield and specificity, temperatures (annealing) and cycling times should be optimized for each new template target or primer pair.