Double-Strand Specific DNase (dsDNase)

Product Data

Alternative names
Shrimp DNase

Source
Produced in a *Pichia pastoris* strain expressing a recombinant gene for a nuclease from *Pandalus borealis* (arctic shrimp).

Concentration
1-50 U/µl

Specific activity
Ca. 475 000 Unit/mg

Unit definition
One unit increases the absorbance at 260 nm by 0.001 OD per min at 25°C and pH 5.0 with large molecular weight DNA as the substrate according to the assay method of Kunitz.

Storage
Store at -20°C
Stable at 4°C, and can also be stored for prolonged time in a refrigerator.

Storage buffer
20 mM Tris-HCl (pH 7.5 at 25°C)
2.0 mM $MgCl_2$
10 mM NaCl
0.01% (v/v) Triton X-100
50% (v/v) glycerol

Protocol recommendations
For preferential degradation of dsDNA and no RNase activity, use a reaction buffer containing 20 mM Tris-HCl (pH 8.0) and 2.5 mM $MgCl_2$.

Activators
Mg^{2+} ions (up to 10 mM) are required for maximum activity.
Optimum pH: 7.5
Optimum reaction temperature: 40°C

Purity
The enzyme is purified to apparent homogeneity by SDS-PAGE.

Properties
dsDNase is an endonuclease that cleaves phosphodiester linkages in DNA to yield oligonucleotides with 5'-phosphate and 3'-hydroxyl termini. dsDNase has a very high specific activity, estimated 30 times higher than bovine DNase I, and it is heat labile. dsDNase has a particularly strong preference for double-stranded DNA (dsDNA). In the presence of magnesium as only divalent cation and using oligos as a substrate; the activity towards dsDNA is 5000-fold higher than towards ssDNA. The enzyme can therefore be used to specifically degrade dsDNA, leaving ssDNA essentially intact.

Applications
Removal of contaminating DNA before PCR or RT-PCR leaving single-stranded primers and RNA intact.

Heat inactivation
The enzyme is easily heat-inactivated at 65°C for 15 min in the presence of 1 mM DTT.

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