

Velocut HpaII

Cat.No.:HYF265

Product Description

Velocut enzymes are a series of engineered restriction enzymes that are capable of fast DNA digestion. All Velocut enzymes show superior activity in the universal Buffer and Color Buffer, and are able to digest DNA in 5~15 minutes. This enables any combination of restriction enzymes to work simultaneously in one reaction tube and eliminates the need for sequential digestions. Velocut enzymes have passed multiple strict quality controls, and can be used to digest plasmid, genomic and viral DNA as well as PCR products.

Color Buffer includes a density reagent along with red and yellow tracking dyes that allow for direct loading of the reaction mixtures on a gel. The red dye of the Color Buffer migrates with 2.5 kb double-strand DNA fragments in a 1% agarose gel, and the yellow dye migrates with 10 bp double-strand DNA fragments in a 1% agarose gel.



Components

Components	200 rxns
Velocut HpaII	200 µL
10× Buffer	2× 1 mL
10× Color Buffer	2× 1 mL

Storage

Store at -20°C.

Heat Inactivation

Incubation at 80°C for 20 minutes.

Notes

1. This enzyme will digest unit substrate in 5~15 minutes under recommended reaction conditions.
2. The enzyme's optimum reaction temperature is 37°C.
3. Cleavage with this restriction enzyme may be blocked or impaired when the substrate DNA is methylated by the CpG methylase.
4. The enzyme can be heat inactivated at by incubation 80°C for 20minutes
5. 3 hours incubation do not show star activity, but longer incubation may result in star activity.

Quality Control

1. Functional Test

A 20 µL reaction in Buffer containing 1 µg of λDNA and 1 µL of Velocut HpaII incubated for 15 minutes at 37°C results in complete digestion as determined by agarose gel electrophoresis.

2. Prolonged Incubation / Star Activity Assay

A 20 µL reaction in Buffer containing 1 µg of λDNA and 1 µL of Velocut HpaII incubated for 3 hours at 37 °C results in a DNA pattern free of detectable nuclease degradation as determined by agarose gel electrophoresis. Longer incubation may result in star activity.

3. Ligation and Recutting

After 10-fold over-digestion with Velocut HpaII at 37 °C , >95% of the DNA fragments can be ligated with T4 DNA Ligase at 22°C. Of these ligated fragments, >95% can be recut with Velocut HpaII as determined by agarose gel electrophoresis.

Instructions

1. Protocol for Fast DNA Digestion

- 1) Combine the following reaction components on ice in the order indicated:

Components	Plasmid DNA	PCR product	Genomic DNA
ddH ₂ O	15 µL	16 µL	30 µL
10× Buffer <i>or</i> 10× Color Buffer	2 µL	3 µL*	5 µL
DNA	2 µL (up to 1 µg)	10 µL (~0.2 µg)	10 µL (5 µg)
Velocut HpaII	1 µL	1 µL	5 µL
Total	20 µL	30 µL	50 µL

*For purified PCR products. If the PCR products are not purified, amount of 10× Buffer should be reduced to 2 µL due to the remaining metal ions in the unpurified PCR products. We recommend to

purify PCR products before digestion if it will be used for cloning, because the exonuclease activity of some DNA polymerases may alter the end of cleaved DNA.

- 2) Mix gently and spin down;
- 3) Incubate at 37°C for 15 minutes (plasmid DNA) or for 15~30 minutes (PCR product) or for 30~60 minutes (genomic DNA);
- 4) Optional: Inactivate the enzyme by heating for 20 minutes at 80°C;
- 5) If the Color Buffer was used in the reaction, load an aliquot of the reaction mixture directly on a gel.

2. Double and Multiple Digestion of DNA

- 1) Use 1 µL of each enzyme and scale up the reaction conditions appropriately;
- 2) The combined volume of the enzymes in the reaction mixture should not exceed 1/10 of the total reaction volume;
- 3) If the enzymes require different reaction temperatures, start with the enzyme that requires a lower temperature, then add the second enzyme and incubate at the higher temperature.

3. Scaling up Plasmid DNA Digestion Reaction

DNA	1 µg	2 µg	3 µg	4 µg	5 µg
Velocut HpaII	1 µL	2 µL	3 µL	4 µL	5 µL
10× Buffer <i>or</i> 10× Color Buffer	2 µL	2 µL	3 µL	4 µL	5 µL
Total	20 µL	20 µL	30 µL	40 µL	50 µL

Note: Increase the incubation time if the total reaction volume exceeds 20 µL.

Number of Recognition Sites in DNA

λDNA	ΦX174	pBR322	pUC57	pUC18/19	SV40	M13mp18/19	Adeno2
328	5	26	13	13	1	18	171

Methylation Effects on Digestion

Dam	Dcm	CpG	EcoKI	EcoBI
No effect	No effect	Blocked	No effect	No effect

Note: MspI is an isoschizomer of HpaII. When the external C in the sequence CCGG is methylated, MspI and HpaII cannot cleave. However, unlike HpaII, MspI can cleave the sequence when the internal C residue is methylated.

Activity in Different Buffers*

	Hyasen Buffer	Thermo Scientific FastDigest Buffer	NEB rCutSmart™ Buffer	Takara QuickCut™ Buffer
Activity	100%	<25%	100%	<25%

*The activity data come from the functional test described above.