

Enzyme	Cat. #	Sequence 5' → 3'	Enzyme Properties	Activity in FastGene Buffer [%]			
				I	II	III	IV
Aat II	FG-AatII	GACGT↓C		0	25	25	100
Acc I	FG-Accl	GT↓MKAC		75	100	100	100
Acc III*	FG-AcclIII	T↓CCGGA		0	25	100	0
Accu I	FG-AccuI	CTGAAGN↓ ₅		50	50	75	100
Afl II	FG-AflII	C↓TTAAG		75	100	75	100
Age I	FG-AgeI	A↓CCGGT		100	50	0	100
Alw I	FG-AlwI	GGATCNNNN↓N		50	50	10	100
Alw26 I	FG-Alw26I	GTCTCN↓NNNN		75	100	50	100
Apa I	FG-ApaI	GGCC↓C		100	25	0	100
ApaL I	FG-ApaLI	G↓TGCAC		50	100	50	100
Apo I	FG-ApoI	R↓AATTY		10	75	100	75
Asc I	FG-AscI	GG↓CGGCC		0	0	0	100
Ava I	FG-AvaI	C↓YCGRG		25	100	100	100
Ava II	FG-AvaII	G↓GWCC		100	100	50	100
Avr II	FG-AvrII	C↓CTAGG		100	50	50	100
Bal I*	FG-BalI	TGG↓CCA		0	75	25	75
BamH I*	FG-BamHI	G↓GATCC		75	100	100	100
Bcl I	FG-BclI	T↓GATCA		50	100	100	75
Bgl I	FG-BglI	GCCNNNN↓NGGC		75	75	100	50
Bgl II	FG-BglII	A↓GATCT		10	75	100	10
Bsa I	FG-BsaI	GGTCTCN↓NNNN		50	100	100	100
BsaW I	FG-BsaWI	W↓CCGGW		50	100	100	100
BsiW I	FG-BsiWI	C↓GTACG		50	75	100	50
BsmB I	FG-BsmBI	CGTCTCN↓NNNN		10	50	100	25
BsoB I	FG-BsoBI	C↓YCGRG		10	100	100	100
BspE I	FG-BspEI	T↓CCGGA		10	10	100	10
BsrF I	FG-BsrFI	R↓CCGGY		75	100	100	100
BstY I	FG-BstYI	R↓GATCY		50	100	75	100
BtsC I	FG-BtsCI	GGATGNN↓		75	100	100	100
Cfr10 I*	FG-Cfr10I	R↓CCGGY		10	10	10	25
Cfr42 I	FG-Cfr42I	CCG↓GG		100	0	25	75
Cfr9 I	FG-Cfr9I	C↓CCGGG		0	0	100	0
Cla I	FG-ClaI	AT↓CGAT		50	75	75	100
CviA I	FG-CviAI	↓GATC		10	50	10	100
Dde I	FG-DdeI	C↓TNAG		25	50	100	50
Dpn I	FG-DpnI	GA↓TC		75	100	100	100
Dpn II*	FG-DpnII	↓GATC		25	75	100	75
Dra I	FG-DraI	TTT↓AAA		75	100	50	100
Eag I	FG-EagI	C↓GGCCG		10	25	100	10
Eco47 I	FG-Eco47I	G↓GWCC		100	100	100	100
EcoN I	FG-EcoNI	CCTNN↓NNNAGG		50	100	75	100
EcoO109 I	FG-EcoO109I	RG↓GNCCY		50	75	100	100
EcoR I*	FG-EcoRI	G↓AATTC		50	100	75	100
EcoRV	FG-EcoRV	GAT↓ATC		0	100	100	50
EcoT38 I	FG-EcoT38I	GRGCV↓C		75	100	0	100
Esp3 I	FG-Esp3I	CGTCTCN↓NNNN		25	50	10	100
Fok I	FG-FokI	GGATGN↓ ₂		100	100	10	100
Fsp I	FG-FspI	TGC↓GCA		75	100	50	100
Hae II	FG-HaeII	RGGCG↓Y		10	100	100	100
Hae III	FG-HaeIII	GG↓CC		50	100	75	100
Hga I	FG-HgaI	GACGCN↓ ₂ N ₄		100	75	10	100
Hinc II	FG-HincII	GTY↓RAC		75	50	50	100
Hind II	FG-HindII	GTY↓RAC		100	100	50	100
Hind III	FG-HindIII	A↓AGCTT		25	100	75	100
Hinf I	FG-HinfI	G↓ANTC		50	100	100	100
HinP1 I	FG-HinP1I	G↓CGC		50	100	100	75
Hpa I	FG-HpaI	GTT↓AAC		0	50	25	100

*Supplied with Unique Buffer

Enzyme	Cat. #	Sequence 5' → 3'	Enzyme Properties	Activity in FastGene Buffer [%]			
				I	II	III	IV
Hpa II	FG-HpaII	C↓CGG		100	75	50	100
Hph I	FG-HphI	GGTGAN7↓		100	75	10	100
Hpy188 I	FG-Hpy188I	TCN↓GA		50	75	50	100
Hpy99 I	FG-Hpy99I	CGWCG↓		100	25	10	100
HpyCH4 V	FG-HpyCH4V	TG↓CA		75	100	25	100
Kpn I	FG-KpnI	GGTAC↓C		100	50	0	100
Kpn2 I	FG-Kpn2I	T↓CCGGA		100	25	75	50
Lsp1109 I	FG-Lsp1109I	GCAGCN7↓N3		25	75	100	100
Mbo I	FG-MboI	↓GATC		75	100	100	100
Mbo II	FG-MboII	GAAGAN7↓		100	100	50	100
Mlu I	FG-MluI	A↓CGCGT		25	75	100	50
Mnl I	FG-MnlI	CCTCN6↓		75	100	75	100
Mse I	FG-MseI	T↓TAA		75	100	100	100
Msp I	FG-MspI	C↓CGG		75	100	75	100
MspA1 I	FG-MspA1I	CMG↓CKG		0	100	75	100
Mun I	FG-MunI	C↓AATG		100	100	10	100
Nae I	FG-NaeI	GCC↓GGC		100	100	25	100
Nco I	FG-NcoI	C↓CATG		50	100	100	75
Nde I	FG-NdeI	CA↓TATG		75	100	100	100
NgoM IV	FG-NgoMIV	G↓CCGGC		25	75	0	100
Nhe I	FG-NheI	G↓CTAGC		100	100	10	100
Nla IV	FG-NlaIV	GGN↓NCC		0	10	10	100
Not I	FG-NotI	GC↓GGCCG		0	50	100	0
Nru I	FG-NruI	TG↓CGCA		0	50	100	75
Nt.BstNB I	FG-Nt.BstNBI	GAGTCNNNN↓		0	10	100	0
PaeR7 I	FG-PaeR7I	C↓TCGAG		25	100	10	100
PfiM I	FG-PfiMI	CCANNNN↓NTGG		0	100	100	50
Ple I	FG-PleI	GAGTCNNNN↓N		75	75	50	100
PluT I	FG-PluTI	GGCGC↓C		75	25	10	100
PspG I	FG-PspGI	↓CCWGG		25	100	75	100
Pst I	FG-PstI	CTGCA↓G		100	100	100	75
Pvu I	FG-PvuI	CGAT↓CG		25	75	100	50
Pvu II	FG-PvuII	CAG↓CTG		75	100	25	10
Rsa I	FG-RsaI	GT↓AC		100	100	75	100
Sac I	FG-SacI	GAGCT↓C		100	75	25	75
Sac II	FG-SacII	CCGC↓GG		50	100	50	100
Sal I	FG-SalI	GTGAC		0	0	100	0
Sau96 I	FG-Sau96I	G↓GNCC		50	100	100	100
Sbf I	FG-SbfI	CCTGCA↓GG		50	25	10	100
Sca I	FG-ScaI	AGT↓ACT		0	0	100	0
Sda I	FG-SdaI	CCTGCA↓GG		75	75	0	100
Sfi I	FG-SfiI	GGCCN3↓NGGCC		25	100	25	100
SgrA I	FG-SgrAI	CR↓CCGGY		100	100	0	100
Sma I	FG-SmaI	CCC↓GGG		0	0	0	100
SnaB I	FG-SnaBI	TAC↓GTA		100	75	25	100
Spe I	FG-SpeI	A↓CTAGT		50	100	75	100
Sph I	FG-SphI	GCATG↓C		50	100	50	75
Sse9 I	FG-Sse9I	↓AATT		100	50	50	75
Ssp I	FG-SspI	AAT↓ATT		50	100	25	100
Stu I	FG-StuI	AGG↓CCT		75	100	75	100
StyD4 I	FG-StyD4I	↓CCNGG		10	100	100	100
Swa I	FG-SwaI	ATTT↓AAAT		75	75	100	25
Taq I	FG-TaqI	T↓CGA		50	100	100	100
TspM I	FG-TspMI	C↓CCGGG		50	75	50	100
Tth111 I	FG-Tth111I	GACN↓NNGTC		25	100	100	100
Xba I	FG-XbaI	T↓CTAGA		0	100	100	100
Xho I	FG-XhoI	C↓TCGAG		50	100	100	100
Xma I	FG-XmaI	C↓CCGGG		50	75	25	100

Activity of Unique Buffer

Some restriction endonucleases require unique buffer for maximal activity.

Enzyme	For the selection of double digestion buffer if a restriction enzyme requires unique buffer, please refer to the table „Activity Chart of common restriction enzymes in the five Unique Buffers“
Acc III	Get here the table
Bal I	
BamHI	
Cfr10 I	
Dpn II	
EcoRI	
EcoRV	

Ligases

The FastGene® T4 DNA Ligase catalyzes the formation of a covalent bond between the 5'-phosphate and 3'-OH in nicked duplex DNA or at two DNA ends.

Cat. #	Ligase
FG-T4	T4 DNA Ligase (20,000 U)
FG-T4HC	T4 DNA Ligase (100,000 U, 2000 units/μl)
FG-T4BP	T4 DNA Ligase (100,000 U, 400 units/μl)
FG-LK30	Kickspeed DNA Ligation kit (30 rxns)
FG-LK60	Kickspeed DNA Ligation kit (60 rxns)
FG-LM50	Kickspeed 2x DNA Ligation Mix (50 rxns)

Chart Legend

- Optimal reaction temperature
- Supplied buffer
- Cleavage blocked or impaired by CpG, Dam or Dcm methylation
- Thermal inactivation condition
- Not heat inactivatable
- FastCut protocol available
- Supplied with unique buffer

Buffer Compositions (1x)

- Buffer I**
10 mM Bis Tris propane HCl (pH 7.0 @ 25°C), 10 mM MgCl₂, 100 μg/ml BSA
- Buffer II**
10 mM Tris-HCl (pH 7.9 @ 25°C), 50 mM NaCl₂, 10 mM MgCl₂, 100 μg/ml BSA
- Buffer III**
50 mM Tris-HCl (pH 7.9 @ 25°C), 100 mM NaCl₂, 10 mM MgCl₂, 100 μg/ml BSA
- Buffer IV**
20 mM Tris-acetate (pH 7.9 @ 25°C), 50 mM potassium acetate, 10 mM magnesium acetate, 100 μg/ml BSA

Nippon Genetics DNA Ladder

For each application the right ladder

FastGene DNA Ladder

Setting up a Double Digestion

- Double Digestion using Color-Coded Buffers** (I, II, III, IV)
 - If possible, use the buffer in which both enzymes have 100% activity.
 - [Example]**
For performing a double digestion reaction using Not I and Pst I, simply select Buffer III, because both enzymes are 100% active on Buffer III.
 - If there is no optimal buffer for both enzymes, use a non-optimal Buffer and adjust the number of units or incubation time for the slower rate of cleavage.
 - [Example]**
For performing a double digestion reaction using Not I and Pvu II, we recommend to select a Buffer II and use double unit of Not I than Pvu II because, Not I exhibits only 50% of activity on Buffer II.
- Double Digestion the FastCut Buffer** (FC)
 - Most restriction enzymes are 100% active in FastCut Buffer, making double digestion simple. The FastCut digestion enables a restriction in 5-15 min.