

About us.

SibEnzyme Ltd. (Siberian Enzyme, SE),
is a privately owned Russian company founded in 1991.
SibEnzyme Ltd. is located in Academtown near Novosibirsk city – the capital of
Siberia and a geographic center of Russia.

SibEnzyme's primary focus is production of enzymes and related products for
molecular biology, PCR and genetic engineering. SE product line includes more than
200 enzymes, a set of perfect DNA ladders,
high quality enzymatic dNTPs and DNA preparations.

SibEnzyme Ltd. is one of the leading companies in research, development and
production of restriction endonucleases and new DNA endonucleases.

A new type of methyl-directed DNA endonucleases
has been discovered and characterized in our laboratories.
These new enzymes are a good instrument to detect DNA methylation status
in epigenetics studies and medical applications.

Information about SibEnzyme products may be found at
www.sibenzyme.com

Scientific publications with detailed study of new enzymes are available at
www.science.sibenzyme.com

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Restriction Endonucleases

Aat II (prototype Aat II)Isolated from an *E.coli* strain that carries the cloned Aat II gene from *Acetobacter aceti*GACGT[^]C
C[^]TGCAE287
E288500 u.a.
2500 u.a.**Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0,1 mM EDTA;
200 μ g/ml BSA; 1 mM DTT; and
50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Aat II, about 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of Aat II for 16 hours.**Star activity:** High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	10-25	25-50	100

Abs I (prototype Abs I)Isolated from *Arthrobacter species* 7M06CC[^]TCGAGG
GGAGCT[^]CCE535
E53650 u.a.
250 u.a.**Concentration:** 500 - 1 000 units/ml**Assayed on** pUC19SE/DriI digest**Reagents Supplied with Enzyme:**
10 \times SE Buffer AbsI**Reaction conditions:** 1 \times SE Buffer AbsI
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 0.05% Triton X-100 and 50% glycerol.
Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Abs I, ~90% of the DNA fragments can be ligated with T4 DNA Ligase and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of DNA with 2 units of Abs I for 16 hours.**Star activity:** A long incubation time may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	10-25	0	50-75	0-10

Acc16 I (prototype Mst I)Isolated from *Acinetobacter calcoaceticus* 16TGC[^]GCA
ACG[^]CGTE001
E002200 u.a.
1000 u.a.**Concentration:** 5 000-10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer W**Reaction conditions:** 1 \times SE Buffer W
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA; and 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Acc16 I, ~90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Acc16 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	25-50	100	75-100

Acc36 I (prototype BspM I)Isolated from *Acinetobacter calcoaceticus* 36ACCTGC(N)₄[^]
TGGACG(N)₈[^]E289
E290100 u.a.
500 u.a.**Concentration:** 2000-5000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5); 100 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 100 μ g/ml BSA; and 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Acc36I, 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 3 units of Acc36 I for 16 hours.**Star activity:** High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	50-75	50-75	100

Acc65 I (prototype Kpn I)	G[^]GTACC CCATG[^]G	E003 E004	1000 u.a. 5000 u.a.		
Isolated from <i>Acinetobacter calcoaceticus</i> 65					
Concentration: 10 000 - 30 000 units/ml Assayed on λ DNA (dcm ⁻) Reagents Supplied with Enzyme: 10×SE Buffer W Reaction conditions: 1× SE Buffer W Incubate at 37°C. Blocked by overlapping <i>dcm</i> -methylation (C ^m CWGG): GGTACCWGG Acc65I is a neoschizomer of KpnI.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; and 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Acc65 I, >90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Acc65 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	75-100	100	10-25

AccB1 I (prototype HgiC I)	G[^]GYRCC CCRYG[^]G	E163 E164	500 u.a. 2500 u.a.		
Isolated from <i>Acinetobacter calcoaceticus</i> B1					
Concentration: 5 000 -10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer K, BSA Reaction conditions: 1× SE Buffer K +BSA Incubate at 37°C. <i>To obtain 100% activity, BSA should be added to the 1×reaction mix to a final concentration of 100 µg/ml.</i>	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with AccB1 I, 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of AccB1 I for 16 hours. Star activity: High enzyme concentration may result in star activity. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	10-25	10-25	75-100	50-75

AccB7 I (prototype PfiM I)	CCANNNN[^]NTGG GGTN[^]NNNNACC	E179 E180	200 u.a. 1000 u.a.		
Isolated from <i>Acinetobacter calcoaceticus</i> B7					
Concentration: 5 000 units/ml Assayed on λ DNA (dcm ⁻) Reagents supplied with Enzyme: 10×SE Buffer G Reaction conditions: 1× SE Buffer G Incubate at 37°C. Blocked by overlapping <i>dcm</i> -methylation (C ^m CWGG): CCANNNCCTGG or CCAGGNNTGG	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with AccB7 I, 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of AccB7 I for 16 hours. Star activity: High enzyme concentration may result in star activity.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	100	25-50	50-75	50-75

AccBS I (prototype BsrB I)	GAG[^]CGG CTC[^]GCC	E007 E008	1000 u.a. 5000 u.a.		
Isolated from <i>Acinetobacter calcoaceticus</i> BS					
Concentration: 5000 – 20 000 units/ml Assayed on: λ DNA Reagents supplied with Enzyme: 10× SE Buffer Y Reaction conditions: 1× SE Buffer Y Incubate at 37°C.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with AccBS I, 90% of the DNA fragments can be ligated. Of these, 50% can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of AccBS I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	25-50	100

Acl I (prototype Acl I)	AA[^]CGTT TTGC[^]AA	E011 E012	200 u.a. 1000 u.a.		
Isolated from <i>Acinetobacter calcoaceticus</i>					
Concentration: 3 000 – 5 000 units/ml Assayed on: λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y, BSA Reaction condition: 1xSE Buffer Y + BSA Incubate at 37°C. <i>To obtain 100% activity, BSA should be added to the 1×reaction mix to a final concentration of 100 µg/ml.</i> Blocked by CpG methylation.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 0,05% Triton X-100; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 2-fold overdigestion with Acl I, 90% of the DNA fragments can be ligated and recut with this enzyme. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 2 units of Acl I for 16 hours. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	0-10	0-10	0-10	100

AclW I (prototype Bin I)	GGATC(N)₄[^]	E211	100 u.a.			
Isolated from <i>Acinetobacter calcoaceticus</i> W2131	CCTAG(N)₅[^]	E212	500 u.a.			
Concentration: 1000 - 3000 units/ml	Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM KCl; 0,1 mM EDTA;	Ligation/recutting assay: After 2-fold overdigestion with AclW I, about 50% of the DNA fragments can be ligated and recut.				
Assayed on λ DNA (dam ⁻)	7 mM 2-mercaptoethanol; 200 µg/ml BSA; and 50% glycerol. Store at -20°C.	Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 6 units of AclW I for 16 hours.				
Reagents Supplied with Enzyme: 10×SE Buffer Y, BSA	Diluent: SE Buffer A	Do not use BSA for long incubation.				
Reaction conditions: 1×SE Buffer Y+BSA Incubate at 37°C.	Heat inactivation: Yes (65° C for 20 minutes)					
<i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i>						
Blocked by overlapping <i>dam</i> -methylation (G ^m ATC): GG^mATC						
	SE Buffers	B	G	O	W	Y
	Activity in SE Buffers (% of max)	75-100	50-75	0-10	0-10	100

Aco I (prototype Cfr I)	Y[^]GGCCR RCCG[^]Y	E499	100 u.a.			
Isolated from <i>Acinetobacter calcoaceticus</i>		E500	500 u.a.			
Concentration: 500 – 2 000 units/ml	Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0,1 mM EDTA;	Ligation/recutting assay: After 3-fold overdigestion with Aco I, >90% of λ DNA fragments can be ligated with T4 DNA Ligase at 16°C and recut.				
Assayed on: λ DNA(dam ⁻ , dcm ⁻)	7 mM 2-mercaptoethanol; 100 µg/ml BSA; and 50% glycerol. Store at -20°C.	Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 2 units of Aco I for 16 hours.				
Reagents Supplied with Enzyme: 10×SE Buffer G	Diluent: SE Buffer A					
Reaction condition: 1xSE Buffer G Incubate at 37°C.	Heat inactivation: Yes (65° C for 20 minutes)					
Blocked by overlapping <i>dcm</i> -methylation (C ^m CWGG): CCTGGCCR .						
	SE Buffers	B	G	O	W	Y
	Activity in SE Buffers (% of max)	50-75	100	50-75	25-50	75-100

Acs I (prototype Apo I)	R[^]AATTY	E013	500 u.a.			
Isolated from <i>Arthrobacter citreus</i>	YTAA[^]R	E014	2500 u.a.			
Concentration: 10 000 – 20 000 units/ml	Storage buffer: 20 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA;	Ligation/recutting assay: After 20-fold overdigestion with Acs I, >95% of the DNA fragments can be ligated and recut.				
Assayed on λ DNA	10 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.	Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 50 units of Acs I for 16 hours.				
Reagents Supplied with Enzyme: 10×SE Buffer W, BSA	Diluent: SE Buffer A	Do not use BSA for long incubation.				
Reaction condition: 1xSE Buffer W+BSA Incubate at 50°C.	Heat inactivation: Yes (80° C for 20 minutes)					
<i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i>						
	SE Buffers	B	G	O	W	Y
	Activity in SE Buffers (% of max)	25-50	50-75	50-75	100	10-25

Acu I (prototype Eco57 I)	CTGAAG(N)₁₆[^]	E451	50 u.a.			
Isolated from an <i>E.coli</i> strain that carries the cloned Acu I gene from <i>Acinetobacter calcoaceticus</i> SRW4	GACTTC(N)₁₄[^]	E452	250 u.a.			
Concentration: 1 000 units/ml	Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0,1 mM EDTA; 1 mM DTT;	Ligation/recutting assay: After 2-fold overdigestion with Acu I, about 80% of the DNA fragments can be ligated. Of these, 80% can be recut.				
Assayed on λ DNA	200 µg/ml BSA; 50% glycerol. Store at -20° C.	Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 2 units of Acu I for 16 hours.				
Reagents Supplied with Enzyme: 10×SE BufferY, BSA, SAM	Diluent: SE Buffer A	Star activity: High enzyme concentration may result in star activity.				
Reaction conditions: 1×SE Buffer Y+BSA+SAM Incubate at 37°C.	Heat inactivation: Yes (65° C for 20 minutes)	Do not use BSA for long incubation.				
<i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml, and SAM should be added to a final concentration 0.01 mM.</i>						
	SE Buffers	B	G	O	W	Y
	Activity in SE Buffers (% of max)	25-50	50-75	50-75	75-100	75-100

Afe I (prototype Eco47 III)

Isolated from an *E.coli* strain that carries the cloned Afe I gene from *Alcaligenes faecalis* T2774

AGC[^]GCT
TCG[^]CGA

E213
E214

200 u.a.
1000 u.a.

For high concentration

E214X 1000 u.a.

Concentration: 10 000 and 50 000 units/ml

Assayed on λ DNA (BamHI-digest)

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.6); 50 mM NaCl; 0,1 mM EDTA; 1 mM DTT; 200 μ g/ml BSA; and 50% glycerol.

Store at -20°C

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Afe I, > 80% of pBR322 DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of the λ DNA with 40 units of Afe I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	75-100	75-100	100

Ags I (prototype Ags I)

Isolated from *Agrococcus species* 25



TTS[^]AA
AA[^]STT

E573
E574

200 u.a.
1000 u.a.

Concentration: 5000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y, BSA

Reaction conditions: 1 \times SE Buffer Y + BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with AgsI, >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of Ags I for 16 hours.

Do not use BSA for long incubation

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	10-25	10-25	100

Ahl I (prototype Spe I)

Isolated from *Alteromonas haloplanktis* SP

A[^]CTAGT
TGATC[^]A

E173
E174

1000 u.a.
5000 u.a.

Concentration: 10 000 - 30 000 units/ml

Assayed on T7 DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer B, BSA

Reaction conditions: 1 \times SE Buffer B+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65°C, 80°C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Ahl I, >90% of T7 DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of T7 DNA with 40 units of Ahl I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	25-50	25-50	75-100

Ajn I (prototype EcoR II)

Isolated from *Acinetobacter johnsonii* R2

[^]CCWGG
GGWCC[^]

E473
E474

200 u.a.
1000 u.a.

Concentration: 500 - 3 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 55°C.

Not blocked by overlapping *dcm*-methylation (C^mCWGG): **CCWGG**

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with AjnI, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 6 units of Ajn I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	10-25	10-25	25-50	100

Alu I (prototype Alu I)

Isolated from an *E.coli* strain that carries the cloned AluI gene from *Arthrobacter luteus*



AG[^]CT
TC[^]GA

E015
E016

200 u.a.
1000 u.a.

Concentration: 2 000 - 5000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Alu I, >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 4 units of Alu I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	10-25	50-75	100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

AluB I (prototype Alu I)

Isolated from *Arthrobacter luteus* B

Concentration: 5 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer B, BSA

Reaction conditions: 1 \times SE Buffer B + BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Note: AluB I is an isoschizomer of Alu I. AluB I is able to cleave some methylated DNA substrates.

See: http://science.sibenzyme.com/article8_article_30_1.phtml

AG[^]CT
TC[^]GA

E549
E550

200 u.a.
1000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with AluB I, 80% of λ DNA fragments can be ligated with T4 DNA Ligase and can be recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of AluB I for 16 hours.

Do not use BSA for long incubation

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	10-25	10-25	75-100

Ama87 I (prototype Ava I)

Isolated from *Alteromonas macleodii* 87

Concentration: 10 000 - 30 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer W, BSA

Reaction conditions: 1 \times SE Buffer W+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

C[^]YCGRG
GRGCY[^]C

E017
E018

1000 u.a.
5000 u.a.

Storage buffer: 10 mM KH₂PO₄ (pH 7.2);

100 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Ama87 I, >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Ama87 I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	50-75	75-100	100	0-10

Apa I (prototype Apa I)

Isolated from *Acetobacter pasteurianus*

Concentration: 10 000 - 30 000 units/ml

Assayed on λ DNA (dcm⁻, BamHI-digest)

Reagents Supplied with Enzyme:

10 \times SE Buffer Y, BSA

Reaction conditions: 1 \times SE Buffer Y+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Blocked by overlapping dcm-methylation (C^mCWGG): **GGGCCCWGG**.

GGGCC[^]C
C[^]CCGGG

E019
E020

1000 u.a.
5000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Apa I, >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 40 units of Apa I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	25-50	0-10	0-10	100

Ars I (prototype Ars I)

Isolated from *Arthrobacter* species NTS

Concentration: 500 units/ml

Assayed on T7 DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y, BSA

Reaction conditions: 1 \times SE Buffer Y + BSA
Incubate at 30°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.



[^](N)₈GAC(N)₆TTYG(N)₁₁[^]
[^](N)₁₃CTG(N)₆AARC(N)₆[^]

E575
E576

50 u.a.
250 u.a.

Storage buffer: 10 mM KH₂PO₄ (pH 7.4);

200 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Ars I, about 70% of the DNA fragments can be ligated. Of these, 80% can be recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of DNA with 1 units of Ars I for 16 hours.

Do not use BSA for long incubation

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0	0	0	0	100

AsiG I (prototype Age I)

Isolated from *Arthrobacter* species G

Concentration: 3 000 -5000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer O

Reaction condition: 1 \times SE Buffer O

Incubate at 37°C.

A[^]CCGGT
TGGCC[^]A

E235
E236

100 u.a.
500 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;

100 μ g/ml BSA; 7 mM 2-mercaptoethanol;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with AsiG I, >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of AsiG I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	75-100	10-25



New product



Mammalian Genome Qualified



New package

AspA2 I (prototype Avr II)Isolated from *Arthrobacter* species A2**C[^]CTAGG
GGATC[^]C****E245
E246****500 u.a.
2500 u.a.****Concentration:** 10 000 - 20 000 units/ml**Assayed on** λ DNA (Hind III-digest)**Reagents Supplied with Enzyme:**10 \times SE Buffer W, BSA**Reaction conditions:** 1 \times SE Buffer W+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0.1 mM EDTA;

100 μ g/ml BSA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 20-fold

overdigestion with AspA2 I,

> 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of the DNA with 20 units of AspA2 I for 16 hours.**Do not use BSA** for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	50-75	75-100	100	75-100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml**AspLE I (prototype Hha I)**Isolated from *Arthrobacter* species LE3860**GCG[^]C
C[^]GCG****E221
E222****500 u.a.
2500 u.a.****Concentration:** 10 000 - 30 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer O**Reaction conditions:** 1 \times SE Buffer O

Incubate at 37°C.

Blocked by CG methylation

5'-G(5mC)GC-3'/3'-CG(5mC)G-5' or

5'-G(5mC)GC-3'/3'-CGCG-5'

Not blocked by methylation

5'-GCG(5mC)-3'/3'-(5mC)GCG-5' or

5'-GCG(5mC)-3'/3'-CGCG-5'.

Cut hemimethylated site:

5'-G(5mC)GC-3' / 3'-CGCG-5'

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0.1 mM EDTA;

100 μ g/ml BSA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Ligation/recutting assay:** After 20-fold

overdigestion with AspLE I,

>90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of AspLE I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	75-100	100	50-75	25-50

AspS9 I (prototype Sau96 I)Isolated from *Arthrobacter* species S9**G[^]GNCC
CCNG[^]G****E117
E118****1000 u.a.
5000 u.a.****Concentration:** 10 000 -30 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer W**Reaction condition:** 1 \times SE Buffer W

Incubate at 37°C.

Blocked by overlapping *dcm*-methylation(C^mCWGG): **GGNCCWGG****Storage buffer:** 10 mM Tris-HCl (pH 7.5); 50

mM KCl; 0.1 mM EDTA;

200 μ g/ml BSA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 20-fold

overdigestion with AspS9 I,

>90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 30 units of AspS9 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	75-100	100	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml**AsuC2 I (prototype Cau II)**Isolated from *Actinobacillus suis* CA**CC[^]SGG
GG[^]CC****E257
E258****2000 u.a.
10000 u.a.****Concentration:** 20 000 - 50 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

250 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 5-fold

overdigestion with AsuC2 I, ~20% of the DNA fragments can be ligated. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 50 units of AsuC2 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-50	50-75	10-25	25-50	100



AsuHP I (prototype Hph I)

Isolated from *Actinobacillus suis* HP



GGTGA(N)₈[^]
CCTACT(N)₇[^]

E231
E232

200 u.a.
1000 u.a.

Concentration: 2 000 – 5 000 units/ml

Assayed on λ DNA (dam-)

Reagents Supplied with Enzyme:
10×SE Buffer O

Reaction conditions: 1× SE Buffer O
Incubate at 37°C.

Blocked by overlapping *dam*-methylation
(G^mATC): **GGTGATC**.

Enzyme may cleave at N₉/N₈ depending on
the sequence between the recognition and
cleave sites.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold
overdigestion with AsuHP I, about 30%
of the DNA fragments can be ligated and
recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 10 units of AsuHP I
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	50-75	100	75-100	25-50

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

AsuNH I (prototype Nhe I)

Isolated from *Actinobacillus suis* NH



G[^]CTAGC
CGATC[^]G

E063
E064

1000 u.a.
5000 u.a.

Concentration: 10 000 - 20 000 units/ml

Assayed on λ DNA (HindIII-digest)

Reagents Supplied with Enzyme:
10×SE Buffer Y, BSA

Reaction conditions: 1× SE Buffer Y+BSA
Incubate at 37°C.

*To obtain 100% activity, BSA should be
added to the 1× reaction mix to a final
concentration of 100 µg/ml.*

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 100 µg/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
overdigestion with AsuNH I,
> 90% of the DNA fragments can be
ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of the DNA with 20 units of
AsuNH I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	0-10	0-10	100

BamH I (prototype BamH I)

Isolated from an *E.coli* strain that carries the
cloned BamHI gene from *Bacillus
amyloliquefaciens* H

G[^]GATCC
CCTAG[^]G

E021
E022

4000 u.a.
20000 u.a.

For high concentration

E021X 4000 u.a.
E022X 20000 u.a.

Concentration: 20 000 and 50 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:
10×SE Buffer G, BSA

Reaction conditions: 1× SE Buffer G+BSA
Incubate at 37°C.

*To obtain 100% activity, BSA should be
added to the 1× reaction mix to a final
concentration of 100 µg/ml.*

Not blocked by overlapping *dam*-
methylation (G^mATC): **GGATCC**.

Storage buffer: 10 mM Tris-HCl (pH 7.6); 50
mM NaCl; 0.1 mM EDTA;
100 µg/ml BSA, 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 50-fold
overdigestion with BamH I, > 90% of
the DNA fragments can be ligated and
recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 40 units of BamH I
for 16 hours.

Star activity: High enzyme
concentration may result in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	100	75-100	75-100	25-50

Bar I (prototype Bar I)

Isolated from *Bacillus sphaericus*

[^](N)₇GAAG(N)₆TAC(N)₁₂[^]
[^](N)₁₂CTTC(N)₆ATG(N)₇[^]

E547
E548

100 u.a.
500 u.a.

Concentration: 500 - 2 000 units/ml

Assayed on T7 DNA

Reagents Supplied with Enzyme:
10×SE Buffer 2K

Reaction conditions: 1× SE Buffer 2K
Incubate at 37°C.

Storage buffer: 20 mM KH₂PO₄ (pH 7.4);
100 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold
overdigestion with Bar I, about 90% of
T7 DNA fragments can be ligated and
95% of these can be recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of T7 DNA with 2 units of
Bar I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0	0-10	25-50	50-75	10-25



New product




Mammalian Genome Qualified



New package

Bbv12 I (prototype HgiA I) Isolated from <i>Bacillus brevis</i> 12	GWGCW[^]C C[^]WCGWG	E023 E024	200 u.a. 1000 u.a.		
Concentration: 1 000 – 5 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer O Reaction conditions: 1× SE Buffer O Incubate at 37°C.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (80°C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with Bbv12 I, >90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of Bbv12 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	100	75-100	10-25

Bgl I (prototype Bgl I) Isolated from <i>Bacillus globigii</i>	 GCCNNNN[^]NGGC CGGN[^]NNNNCCG	E025 E026	500 u.a. 2500 u.a.		
Concentration: 5 000 – 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10 × SE Buffer 2W Reaction conditions: 1 × SE Buffer 2W Incubate at 37°C. Not blocked by <i>dcm</i> -methylation (C ^m CWGG): GCCWGGNNGGC .	Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bgl I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Bgl I for 16 hours. Star activity: High enzyme concentration may result in star activity.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	0-10	75-100	25-50

Bgl II (prototype Bgl II) Isolated from an <i>E.coli</i> strain that carries the cloned Bgl II gene from <i>Bacillus globigii</i>	A[^]GATCT TCTAG[^]A	E027 E028	1000 u.a. 5000 u.a.		
Concentration: 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer O Reaction conditions: 1× SE Buffer O Incubate at 37°C. Not blocked by overlapping <i>dam</i> - methylation (G ^m ATC): AGATCT .	Storage buffer: 10mM Tris-HCl(pH 7.5); 50 mM NaCl; 0,1 mM EDTA; 1 mM DTT; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65°C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bgl II, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Bgl II for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	100	25-50	10-25

Bis I (prototype Bis I) Isolated from <i>Bacillus subtilis</i> T30	G(5mC)[^]NGC CGN[^](5mC)G	E485 E486	40 u.a. 200 u.a.
See page 47 for more information about this enzyme.			

Bls I (prototype Bls I) Isolated from <i>Bacillus simplex</i> 23	G(5mC)N[^]GC (5mC)G[^]N(5mC)G	E533 E534	100 u.a. 500 u.a.
See page 47 for more information about this enzyme.			

Bme18 I (prototype Ava II) Isolated from <i>Bacillus megaterium</i> 18	G[^]GWCC CCWG[^]G	E029 E030	1000 u.a. 5000 u.a.		
Concentration: 5 000 – 20 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer O Reaction conditions: 1× SE Buffer O Incubate at 37°C. Cleaved of DNA is impaired by overlapping <i>dcm</i> -methylation (C ^m CWGG): GGWCCWGG .	Storage buffer: 10mM Tris-HCl(pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 100 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bme18 I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Bme18 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	75-100	10-25

Bmt I (prototype Nhe I)

Isolated from an *E.coli* strain that carries the cloned Bmt I gene from *Bacillus megaterium* S2

GCTAG[^]C
C[^]GATCG

E457
E458

1000 u.a.
5000 u.a.

Concentration: 20 000 units/ml

Assayed on λ DNA (HindIII-digest)

Reagents Supplied with Enzyme:
10 \times SE Buffer W

Reaction conditions: 1 \times SE Buffer W
Incubate at 37°C.

BmtI is a neoschizomer of NheI.

Storage buffer: 10mM Tris-HCl(pH 7.5);
250 mM NaCl; 0,1 mM EDTA;
200 μ g/ml BSA; 7 mM 2-mercaptoethanol;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Bmt I about 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Bmt I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	50-75	50-75	100	75-100

Bmu I (prototype Bfi I)

Isolated from *Bacillus megaterium* S2

ACTGGG(N)₅[^]
TGACCC(N)₄[^]

E487
E488

100 u.a.
500 u.a.

Concentration: 500 - 1000 units/ml

Assayed on λ DNA (HindIII-digest)

Reagents Supplied with Enzyme:
10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y
Incubate at 37°C.

Enzyme is active in presence of EDTA.

Storage buffer: 10mM Tris-HCl(pH 7.5);
250 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Bmu I about 75% of the DNA fragments can be ligated and 95% of these can be recut.

Overnight digest with BmuI is not recommended. A 50 μ l reaction containing 1 μ g of λ DNA and 0.5 units of enzyme incubated for 4 hours resulted in the same pattern of DNA bands as a reaction incubated for 1 hour.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	10-25	100

Bpm I (prototype Gsu I)

Isolated from *Bacillus pumilus*

CTGGAG(N)₁₆[^]
GACCTC(N)₁₄[^]

E467
E468

50 u.a.
250 u.a.

Concentration: 200 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:
10 \times SE Buffer W, BSA

Reaction conditions: 1 \times SE Buffer W+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10mM Tris-HCl(pH 7.5); 50 mM KCl; 0,1 mM EDTA;
10 mM 2-mercaptoethanol;
200 μ g/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Bpm I about 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 0,4 units of Bpm I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	100	50-75

Bpu10 I (prototype Bpu10 I)

Isolated from an *Escherichia coli* strain that carries plasmids pBpu10IA and pBpu10IB



CC[^]TNAGC
GGANT[^]CG

E149
E150

200 u.a.
1000 u.a.

Concentration: 5 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:
10 \times SE Buffer K

Reaction conditions: 1 \times SE Buffer K
Incubate at 37°C.

Storage buffer: 10mM Tris-HCl(pH 7.5);
50 mM NaCl; 0.1 mM EDTA; 1 mM DTT;
50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Bpu10 I, 80% of the DNA fragments can be ligated. Of these, 90% can be recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of DNA with 5 units of enzyme for 16 hour.

Note: High enzyme concentration may result in star activity or incomplete DNA cleavage. We recommend increasing the incubation time instead of using an excess of Bpu10 I.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	50-75	50-75	25-50

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml



New product



Mammalian Genome Qualified



New package

Bpu14 I (prototype Asu II)Isolated from *Bacillus pumilus* 14TT[^]CGAA
AAGC[^]TTE033
E0341000 u.a.
5000 u.a.**Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer G

Reaction conditions: 1× SE Buffer G

Incubate at 37°C.

Storage buffer: 10mM Tris-HCl(pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold

overdigestion with Bpu14 I, 95% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 20 units of Bpu14 I

for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	25-50	25-50	75-100

Bsa29 I (prototype Cla I)Isolated from *Bacillus stearothermophilus* 29AT[^]CGAT TAGC[^]TAE205
E2061000 u.a.
5000 u.a.**Concentration:** 20 000 units/ml**Assayed on** λ DNA (dam⁻)**Reagents Supplied with Enzyme:**

10×SE Buffer G, BSA

Reaction conditions: 1×SE Buffer G+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be**added to the 1× reaction mix to a final**concentration of 100 µg/ml.***Blocked** by overlapping *dam*-methylation(G^mATC): GATCGATC.**Blocked** by CG methylation.**Storage buffer:** 10mM Tris-HCl(pH 7.5);

250 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA, 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold

overdigestion with Bsa29 I,

> 90% of the DNA fragments can be

ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 40 units of Bsa29 I

for 16 hour.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	100	50-75	50-75	75-100

Bsc4 I (prototype BsiY I)Isolated from *Bacillus schlegelii* 4CCNNNN[^]NNGG
GGNN[^]NNNNCCE219
E220500 u.a.
2500 u.a.**Concentration:** 10 000 - 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W, BSA

Reaction conditions: 1×SE Buffer W+BSA

Incubate at 55°C.

*To obtain 100% activity, BSA should be**added to the 1× reaction mix to a final**concentration of 100 µg/ml.***Storage buffer:** 10mM Tris-HCl(pH 7.5); 50

mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold

overdigestion with Bsc4 I, > 90% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 30 units of Bsc4 I

for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	50-75	100	25-50

Bse1 I (prototype Bsr I)Isolated from *Bacillus stearothermophilus* 1ACTGGN[^]
TGAC[^]CNE035
E0361000 u.a.
5000 u.a.**Concentration:** 10 000 – 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y

Reaction conditions: 1× SE Buffer Y

Incubate at 65°C.

Storage buffer: 10mM Tris-HCl(pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol;

100 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold

overdigestion with Bse1 I, 95% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 40 units of Bse1 I

for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	10-25	100

Bse118 I (prototype Cfr10 I)Isolated from *Bacillus stearothermophilus* 118R[^]CCGGY
YGGCC[^]RE039
E040200 u.a.
1000 u.a.**Concentration:** 2 000-5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer O

Reaction conditions: 1× SE Buffer O

Incubate at 65°C.

Storage buffer: 10 mM KH₂PO₄ (pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol;

100 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold

overdigestion with Bse118 I, 95% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 2 units of Bse118 I

for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	50-75	100	75-100	25-50

Bse21 I (prototype Sau I)Isolated from *Bacillus* species 21CC^TNAGG
GGANT^CCE037
E038500 u.a.
2500 u.a.

Concentration: 10 000 – 30 000 units/ml
Assayed on λ DNA (Hind III-digest)
Reagents Supplied with Enzyme:
 10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
 Incubate at 37°C.

Storage buffer: 10 mM KH₂PO₄ (pH 7.4);
 50 mM KCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol;
 200 μ g/ml BSA, 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 No (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Bse21 I, about 50% of the DNA fragments can be ligated (by using of high concentration T4 DNA Ligase and 10% PEG). Of these, >90% can be recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 30 units of Bse21 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	10-25	25-50	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Bse3D I (prototype BsrD I)Isolated from *Bacillus stearothermophilus* 3DGCAATGNN^
CGTTAC^NNE253
E254500 u.a.
2500 u.a.

Concentration: 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10×SE Buffer G
Reaction conditions: 1× SE Buffer G
 Incubate at 60°C.

Storage buffer: 10mM Tris-HCl(pH 7.5);
 200 mM NaCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol; 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Bse3D I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Bse3D I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	100	25-50	50-75	75-100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Bse8 I (prototype BsaB I)Isolated from *Bacillus* species 8GATNN^NNATC
CTANN^NNTAGE147
E1481000 u.a.
5000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10×SE Buffer G
Reaction conditions: 1×SE Buffer G
 Incubate at 60°C.

Storage buffer: 10mM Tris-HCl(pH 7.5);
 100 mM NaCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol;
 100 μ g/ml BSA; and 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 No (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Bse8 I, 80% of the DNA fragments can be ligated and recut.
Overdigestion assay: Long incubation is not recommended owing to occurrence of star activity.
Star activity: is observed at a greater than 5-fold overdigestion of 1 μ g substrate with Bse8 I.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	100	75-100	75-100	50-75

BseP I (prototype BseP I)Isolated from *Bacillus stearothermophilus* PG^CGCGC
CGCGC^GE181
E182200 u.a.
1000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10×SE Buffer G
Reaction conditions: 1× SE Buffer G
 Incubate at 50°C.
Blocked by CG methylation.

Storage buffer: 10mM Tris-HCl(pH 7.5); 50
 mM KCl; 0,1 mM EDTA;
 10 mM 2-mercaptoethanol;
 200 μ g/ml BSA; 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BseP I, 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of BseP I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	75-100	50-75	50-75

BseX3 I (prototype Xma III)Isolated from *Bacillus stearothermophilus* X3C^GGCCG
GCCGG^CE263
E264200 u.a.
1000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10×SE Buffer O
Reaction conditions: 1× SE Buffer O
 Incubate at 50°C.
Blocked by CG methylation.

Storage buffer: 10mM Tris-HCl(pH 7.5);
 100 mM NaCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol;
 200 μ g/ml BSA; 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 No (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BseX3 I, > 90% of the DNA fragments can be ligated. Of these, 80% can be recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of BseX3 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	50-75	10-25



New product



Mammalian Genome Qualified



New package

BsIF I (prototype Fin I) Isolated from <i>Bacillus stearothermophilus</i> FI	GGGAC(N)₁₀[^] CCCTG(N)₁₄[^]	E479 E480	100 u.a. 500 u.a.		
Concentration: 1 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y, BSA Reaction conditions: 1×SE Buffer Y+BSA Incubate at 37°C. <i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i> BsIF I also cleaves the sequence GGGAC(11/15).	Storage buffer: 10mM Tris-HCl(pH 7.5); 250 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes) Yes (80° C for 20 minutes)	Ligation/recutting assay: After 3-fold overdigestion with BsIF I, 90% of the DNA fragments can be ligated. Of these, 95% can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 2 units of BsIF I for 16 hours. Star activity: High enzyme concentration may result in star activity. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	10-25	25-50	100

Bso31 I (prototype Eco31 I) Isolated from <i>Bacillus stearothermophilus</i> 31	GGTCTC(N)₁[^] CCAGAG(N)₅[^]	E285 E286	200 u.a. 1000 u.a.		
Concentration: 5 000 units/ml Assayed on T7 DNA Reagents Supplied with Enzyme: 10×SE Buffer O, BSA Reaction conditions: 1×SE Buffer O+BSA Incubate at 55°C. <i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i> Not blocked by methylation GGTCT ^m C.	Storage buffer: 10mM Tris-HCl(pH 7.5); 100 mM NaCl; 0,1 mM EDTA; 100 µg/ml BSA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with Bso31 I, 90% of the DNA fragments can be ligated. Of these, 80% can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of T7 DNA with 5 units of Bso31 I for 16 hours. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	75-100	100	75-100	25-50

Bsp13 I (prototype BspM II) Isolated from <i>Bacillus</i> species 13	T[^]CCGGA AGGCC[^]T	E183 E184	1000 u.a. 5000 u.a.		
Concentration: 10 000 – 20 000 units/ml Assayed on λ DNA (dam ⁻) Reagents Supplied with Enzyme: 10×SE Buffer 2K Reaction conditions: 1× SE Buffer 2K Incubate at 50°C. Blocked by overlapping <i>dam</i> -methylation (G ^m ATC): TCCGGATC and GATCCGGA .	Storage buffer: 10mM Tris-HCl(pH 7.5); 200 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bsp13 I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Bsp13 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	50-75	0-10

Bsp1720 I (prototype Esp I) Isolated from <i>Bacillus</i> species 1720	GC[^]TNAGC CGANT[^]CG	E185 E186	500 u.a. 2500 u.a.		
Concentration: 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer G Reaction mixture: 1× SE Buffer G Incubate at 37°C.	Storage buffer: 10mM Tris-HCl(pH 7.5); 250 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bsp1720I, about 80% of the DNA fragments can be ligated. Of these, 95% can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Bsp1720 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	50-75	50-75	75-100

Bsp19 I (prototype Nco I) Isolated from <i>Bacillus</i> species 19	C[^]CATGG GGTAC[^]C	E047 E048	1000 u.a. 5000 u.a.		
Concentration: 10 000 – 20 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer 2W, BSA Reaction conditions: 1×SE Buffer 2W+BSA Incubate at 37°C. <i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i>	Storage buffer: 10mM Tris-HCl(pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with Bsp19 I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Bsp19 I for 16 hours. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	50-75	75-100	10-25

BspAC I (prototype Aci I)Isolated from *Bacillus* species AC**C[^]CGC
GGC[^]G****E501
E502****200 u.a.
1000 u.a.****Concentration:** 2 000 – 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer O, BSA

Reaction conditions: 1×SE Buffer O+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.***Blocked** by CG methylation.**Note:** BspACI has a non-palindromic recognition site.**Qualified for mammalian genome studies:** http://science.sibenzyme.com/article8_article_28_1.phtml**Storage buffer:** 10 mM KH₂PO₄ (pH 7.2);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 5-fold overdigestion with BspAC I, > 95% of λ DNA fragments can be ligated with T4 DNA Ligase at 16°C and 50% of these can be recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BspAC I at 37°C for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	75-100	10-25

BspFN I (prototype FnuD II)Isolated from *Bacillus* species FN**CG[^]CG
GC[^]GC****E557
E558****500 u.a.
2500 u.a.****Concentration:** 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 37°C.

Blocked by CG methylation.**Storage buffer:** 20 mM Tris-HCl (pH 7.5);

300 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 5-fold overdigestion with BspFN I, > 95% of λ DNA fragments can be ligated with T4 DNA Ligase and recut**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BspFN I at 37°C for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	75-100	50-75	100

BsSEC I (prototype Sec I)Isolated from *Bacillus stearothermophilus* EC**C[^]CNNGG
GGNCC[^]C****E273
E274****200 u.a.
1000 u.a.****Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 60°C.

Storage buffer: 10mM Tris-HCl(pH 7.5); 50

mM KCl; 0,1 mM EDTA;

200 µg/ml BSA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Ligation/recutting assay:** After 10-fold overdigestion with BsSEC I 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BsSEC I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	50-75	75-100	100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml**BssNA I (prototype Sna I)**Isolated from *Bacillus stearothermophilus* NA**GTA[^]TAC
CAT[^]ATG****E261
E262****1000 u.a.
5000 u.a.****Concentration:** 10 000 –30 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W, BSA

Reaction conditions: 1× SE Buffer W+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.***Storage buffer:** 10mM Tris-HCl(pH 7.5);

100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

100 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C, 80° C for 20 minutes)**Ligation/recutting assay:** After 10-fold overdigestion with BssNA I, > 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BssNA I for 16 hours**Star activity:** High enzyme concentration results in star activity.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	75-100	100	75-100

BssT1 I (prototype Sty I)Isolated from *Bacillus stearothermophilus* T1**C[^]CWWGG
GGWWC[^]C****E207
E208****1000 u.a.
5000 u.a.****Concentration:** 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer 2K**Reaction conditions:** 1 \times SE Buffer 2K

Incubate at 60°C.

Storage buffer: 10mM Tris-HCl(pH 7.5); 50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 μ g/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 20-fold overdigestion with BssT1 I,

> 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 40 units of BssT1 I for 16 hours.**Star activity:** High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	25-50	75-100	10-25

Bst2B I (prototype Bsi I)Isolated from *Bacillus stearothermophilus* 2B**C[^]TCGTG
GAGCA[^]C****E043
E044****200 u.a.
1000 u.a.****Concentration:** 5 000 - 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer Y, BSA**Reaction conditions:** 1 \times SE Buffer Y+BSA

Incubate at 60°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10mM Tris-HCl(pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Ligation/recutting assay:** After 10-fold overdigestion with Bst2B I, 95% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of Bst2B I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	25-50	10-25	25-50	100

Bst2U I (prototype BstN I)Isolated from *Bacillus stearothermophilus* 2U**CC[^]WGG
GGW[^]CC****E051
E052****1000 u.a.
5000 u.a.****Concentration:** 10 000 – 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer G, BSA**Reaction conditions:** 1 \times SE Buffer G+BSA

Incubate at 60°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Not blocked** by overlapping *dcm*-methylation (C^mCWGG): **CCWGG**.**Storage buffer:** 10mM Tris-HCl(pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 μ g/ml BSA, 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Ligation/recutting assay:** After 2-fold overdigestion with Bst2U I, none of the DNA fragments can be ligated.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of Bst2U I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	50-75	50-75	10-25

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml**Bst4C I (prototype Tsp4C I)**Isolated from *Bacillus stearothermophilus* 4C**ACN[^]GT
TG[^]NCA****E265
E266****500 u.a.
2500 u.a.****Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y

Incubate at 65°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 μ g/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Ligation/recutting assay:** After 10-fold overdigestion with Bst4C I,

~50% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Bst4C I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	10-25	25-50	100

Bst6 I (prototype Ksp632 I)Isolated from *Bacillus stearothermophilus* 6CTCTTC(N)₁[^]
GAGAAG(N)₄[^]E239
E240200 u.a.
1000 u.a.**Concentration:** 1 000 – 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y, BSA

Reaction conditions:

1× SE Buffer Y+BSA

Incubate at 65°C.

*To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA, 50% glycerol.

Store at -20°C (*see note).

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 2-fold overdigestion with Bst6 I, 80% of the DNA fragments can be ligated and 80% of those can be recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of Bst6I for 16 hours.**Do not use** BSA for long incubation.***Note: For long term storage (more than 30 days), store at -70°C .**

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	50-75	75-100	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml**BstAC I (prototype Acy I)**Isolated from *Bacillus stearothermophilus* ACGR[^]CGYC
CYGC[^]RGE093
E094500 u.a.
2500 u.a.**Concentration:** 10 000 – 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W

Reaction conditions: 1×SE Buffer W

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

200 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA; and 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 40-fold overdigestion with BstAC I, 95% of λ DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 40 units of BstACI for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	50-75	100	75-100

BstAF I (prototype Afl II)Isolated from *Bacillus stearothermophilus* AFC[^]TTAAG GAATT[^]CE135
E1361000 u.a.
5000 u.a.**Concentration:** 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W , BSA

Reaction conditions:

1×SE Buffer W + BSA

Incubate at 55°C.

*To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

200 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;

50% glycerol. Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 5-fold overdigestion with BstAF I, about 40% of the DNA fragments can be ligated and 95% of those can be recut. In the presence of 10% PEG ligation is better.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 40 units of BstAF I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	75-100	100	25-50

BstAP I (prototype ApaB I)Isolated from *Bacillus stearothermophilus* APGCANN[^]NTGC
CGTN[^]NNNACGE259
E260200 u.a.
1000 u.a.**Concentration:** 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W

Reaction conditions: 1×SE Buffer W

Incubate at 60°C.

BstAPI is a neoschizomer of ApaBI.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA; 1 mM DTT;

200 µg/ml BSA; and 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 5-fold overdigestion with BstAP I, > 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of BstAPI for 16 hours.**Star activity:** High enzyme concentration (>5 units for 16 hours) on 1µg of DNA may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	75-100	100	25-50



New product



Mammalian Genome Qualified



New package

BstAU I (prototype Bsp1407 I)Isolated from *Bacillus stearothermophilus* AUT[^]GTACA
ACATG[^]TE267
E2681000 u.a.
5000 u.a.**Concentration:** 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W

Reaction conditions: 1×SE Buffer W

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol;

100 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstAU I about 90% of λ DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstAU I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	50-75	25-50	100	25-50

BstBA I (prototype BsaA I)Isolated from *Bacillus stearothermophilus* BAYAC[^]GTR
RTG[^]CAYE237
E238500 u.a.
2500 u.a.**Concentration:** 5 000 - 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer W, BSA

Reaction Conditions:

1×SE Buffer W+BSA

Incubate at 65°C.

Blocked by CG methylation.*To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

10 mM 2-mercaptoethanol;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstBA I, > 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstBA I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	75-100	100	25-50

BstC8 I (prototype Cac8 I)Isolated from *Bacillus stearothermophilus* BAGCN[^]NGC
CGN[^]NGCE305
E306500 u.a.
2500 u.a.**Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 55°C.

Incubation at 37°C results in 50% activity.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

10 mM 2-mercaptoethanol;

200 µg/ml BSA; and 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstC8 I, > 95% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstC8 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	50-75	75-100	100

BstDE I (prototype Dde I)Isolated from *Bacillus stearothermophilus* DEC[^]TNAG
GANT[^]CE227
E228500 u.a.
2500 u.a.**Concentration:** 10 000 – 50 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer G

Reaction conditions: 1×SE Buffer G

Incubate at 60°C.

Incubation at 37°C results in 10% activity.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Ligation/recutting assay: After 30-fold overdigestion with BstDE I, 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 60 units of BstDE I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	50-75	10-25

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml**BstDS I (prototype Dsa I)**Isolated from *Bacillus stearothermophilus* DSC[^]CRYGG
GGYRC[^]CE083
E0841000 u.a.
5000 u.a.**Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 65°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol;

200 µg/ml BSA; and 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)


Ligation/recutting assay: After 10-fold overdigestion with BstDS I, 95% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstDS I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	75-100	50-75	25-50	100



BstEN I (prototype EcoN I) Isolated from <i>Bacillus stearothermophilus</i> EN	CCTNN^NNNAGG GGANN^NNTCC	E103 E104	200 e.a. 1000 e.a.		
Concentration: 2 000 – 5 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 65°C. Not blocked by overlapping <i>dcm</i> -methylation (C ^m CWGG); CCWGGNNNAGG or CCTNNNCCAGG .	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes) Yes (80° C for 20 minutes)	Ligation/recutting assay: After 3-fold overdigestion with BstEN I, about 60% of the DNA fragments can be ligated. Of these, 90 % can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of BstEN I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	25-50	25-50	100

BstF5 I (prototype Fok I) Isolated from <i>Bacillus stearothermophilus</i> F5	GGATGNN^ CCTAC^NN	E031 E032	500 u.a. 2500 u.a.		
Concentration: 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 65°C. BstF5I is a neoschizomer of FokI.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with BstF5 I, > 90% of of the λ DNA fragments can be ligated. Of these, 95 % can be recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstF5 I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	25-50	50-75	100

BstFN I (prototype FnuD II) Isolated from <i>Bacillus stearothermophilus</i> FN	 CG^CG GC^GC	E283 E284	300 u.a. 1500 u.a.		
Concentration: 2 000 - 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 60°C. Blocked by CG methylation.	Storage buffer: 20 mM Tris-HCl (pH 7.5); 300 mM NaCl; 0,1 mM EDTA; 10 mM MgCl ₂ ; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with BstFN I, 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BstFN I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	25-50	25-50	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

BstH2 I (prototype Hae II) Isolated from <i>Bacillus stearothermophilus</i> H2	RGCGC^Y Y^CGCGR	E171 E172	500 u.a. 2500 u.a.		
Concentration: 10 000 – 30 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y, BSA Reaction conditions: 1×SE Buffer Y+BSA Incubate at 65°C. <i>To obtain 100% activity, BSA should be added to the 1×reaction mix to a final concentration of 100 µg/ml.</i>	Storage buffer: 10 mM KH ₂ PO ₄ (pH 7.2); 100 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 20-fold overdigestion with BstH2 I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstH2 I for 16 hours. Star Activity: High enzyme concentration results in star activity. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	0-10	10-25	100

BstHH I (prototype Hha I) **GCG[^]C** **E143** **2000 u.a.**
C[^]GCG **E144** **10000 u.a.**
Isolated from *Bacillus stearothermophilus* HH

Concentration: 50 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme: 10 \times SE Buffer Y, BSA
Reaction conditions: 1 \times SE Buffer Y+BSA Incubate at 50°C.
To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.
Blocked by CG methylation
5'-G(5mC)GC-3'/3'-CG(5mC)G-5' or **5'-G(5mC)GC-3'/3'-CGCG-5'**
Not blocked by methylation
5'-GCG(5mC)-3'/3'-(5mC)GCG-5' or **5'-GCG(5mC)-3'/3'-CGCG-5'**

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: No (65°C, 80° C for 20 minutes)

Ligation/recutting assay: After 40-fold overdigestion with BstHH I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 100 units of BstHH I for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	25-50	50-75	100

BstKT I (prototype Mbo I) **GAT[^]C** **E151** **200 u.a.**
C[^]TAG **E152** **1000 u.a.**
Isolated from *Bacillus stearothermophilus* KT

Concentration: 2 000 – 5 000 units/ml
Assayed on λ DNA (dam⁻)
Reagents Supplied with Enzyme: 10 \times SE Buffer W
Reaction conditions: 1 \times SE Buffer W Incubate at 37°C.
Blocked by overlapping *dam*-methylation (G^mATC): **GATC**.
Not blocked by CG methylation.
Cut hemimethylated site:
5'-G^mATC-3' / 5'-GATC-3'
BstKTI is a neoschizomer of MboI.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 100 μ g/ml BSA; 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BstKT I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of BstKT I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	100	50-75

BstMA I (prototype BsmA I) **GTCTC(N)₁[^]** **E291** **2000 u.a.**
CAGAG(N)₅[^] **E292** **10 000 u.a.**
Isolated from *Bacillus stearothermophilus* MA

Concentration: 30 000 – 100 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme: 10 \times SE Buffer W, BSA
Reaction conditions: 1 \times SE Buffer W+BSA Incubate at 55°C.
To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 100 μ g/ml BSA, 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 50-fold overdigestion with BstMA I, >90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 100 units of BstMA I for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	50-75	100	75-100

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BstMB I (prototype Mbo I) **[^]GATC** **E119** **200 u.a.**
CTAG[^] **E120** **1000 u.a.**
Isolated from *Bacillus stearothermophilus* MB

Concentration: 5 000 - 10 000 units/ml
Assayed on λ DNA (dam⁻)
Reagents Supplied with Enzyme: 10 \times SE Buffer O
Reaction conditions: 1 \times SE Buffer O Incubate at 65°C.
Blocked by overlapping *dam*-methylation (G^mATC): **GATC**.
Not blocked by CG methylation.
Not cut hemimethylated site:
5'-G^mATC-3' / 3'-CTAG-5'

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: No (65° C for 20 minutes)
Yes (80° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstMB I, > 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of BstMB I for 16 hours.


SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	75-100	10-25

BstMC I (prototype Mcr I)	CGRY[^]CG GC[^]YRGC	E071 E072	500 u.a. 2500 u.a.		
Isolated from <i>Bacillus stearothermophilus</i> MC					
Concentration: 5 000 units/ml Assayed on λ DNA Reagents Supplied with: 10×SE Buffer B, BSA Reaction conditions: 1×SE Buffer B+BSA Incubate at 50°C. <i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i>	Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with BstMC I, > 90% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BstMC I for 16 hours. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	10-25	10-25	50-75

BstMW I (prototype Mwo I)	GCNNNN[^]NNGC CGNN[^]NNNNCG	E459 E460	500 u.a. 2500 u.a.		
Isolated from <i>Bacillus stearothermophilus</i> MW					
Concentration: 2 000 – 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 55°C. Incubation at 37° results in 20% activity.	Storage buffer: 10 mM Tris-HCl(pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, and 50% glycerol. Store at -20°C (*see note). Diluent: SE Buffer A Heat inactivation: No (65° C for 20 minutes) Yes (80° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with BstMW I, > 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BstMW I for 16 hours. *Note: For long term storage (more than 7 days), store at -70°C .			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	25-50	50-75	100

BstNS I (prototype Nsp I)	RCATG[^]Y Y[^]GTACR	E251 E252	200 u.a. 1000 u.a.		
Isolated from <i>Bacillus stearothermophilus</i> NS					
Concentration: 10 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer B, BSA Reaction conditions: 1×SE Buffer B+BSA Incubate at 37°C. <i>To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.</i>	Storage buffer: 10 mM Tris-HCl (pH 7.5); 250 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 100 µg/ml BSA; 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation : Yes (65° C for 20 minutes)	Ligation/recutting assay: After 10-fold overdigestion with BstNS I, > 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BstNS I for 16 hours. Do not use BSA for long incubation.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	10-25	75-100

BstPA I (prototype PshA I)	GACNN[^]NNGTC CTGNN[^]NNCAG	E299 E300	1000 u.a. 5000 u.a.		
Isolated from <i>Bacillus stearothermophilus</i> PA					
Concentration: 10 000 –20 000 units/ml Assayed on λ DNA Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 65°C.	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat inactivation : No (65° C, 80° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with BstPA I, < 5% of the DNA fragments can be ligated. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BstPA I for 16 hours at 25°C. Star activity: Incubation at 65°C for 16 hours results in star activity.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	25-50	50-75	50-75	100

BstSC I (prototype ScrF I)	 [^]CCNGG GGNCC[^]	E307 E308	100 u.a. 500 u.a.		
Isolated from <i>Bacillus stearothermophilus</i> SC					
Concentration: 2 000 – 5 000 units/ml Assayed on λ DNA (dcm-) Reagents Supplied with Enzyme: 10×SE Buffer Y Reaction conditions: 1×SE Buffer Y Incubate at 55°C. Incubation at 37 ⁰ C results in 10% activity. Blocked by overlapping <i>dcm</i> -methylation (C ^m CWGG): CCWGG . BstSCI is a neoschizomer of ScrFI. Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml	Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; and 50% glycerol. Store at -20°C. Diluent: SE Buffer A Heat Inactivation: No (65° C for 20 minutes) Yes (80° C for 20 minutes)	Ligation/recutting assay: After 5-fold overdigestion with BstSC I, > 95% of the DNA fragments can be ligated and recut. Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 3 units of BstSC I for 16 hours.			
SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	50-75	50-75	100

BstSF I (prototype Sfe I)Isolated from *Bacillus stearothermophilus* SF**Concentration:** 2 000 - 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer O, BSA**Reaction conditions:** 1 \times SE Buffer O+BSA

Incubate at 60°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5); 100 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; and 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

No (65°C, 80°C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with BstSF I, > 95% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of BstSF I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	25-50	100	50-75	50-75

BstSL I (prototype BseS I)Isolated from *Bacillus stearothermophilus* S**Concentration:** 10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer G, BSA**Reaction conditions:** 1 \times SE Buffer G + BSA

Incubate at 55°C.

Not blocked by overlapping *dcm*-methylation (C^mCWGG):**GKGCCWGG****Blocked** by GKG^mCMC methylation.*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***GKGCMA^C
C^AMCGKG****E561
E562****500 u.a.
2500 u.a.****Storage buffer:** 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BstSL I, ~80% of the DNA fragments can be ligated. Of these, 95% can be recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of BstSL I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	50-75	75-100	75-100

BstSN I (prototype SnaB I)Isolated from *Bacillus stearothermophilus* SN**Concentration:** 5 000 - 10 000 units/ml**Assayed on** T7 DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer B**Reaction conditions:** 1 \times SE Buffer B

Incubate at 37°C.

**TAC^AGTA
ATG^ACAT****E065
E066****200 u.a.
1000 u.a.****Storage buffer:** 10 mM Tris-HCl (pH 7.5); 250 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 100 μ g/ml BSA, 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BstSN I, ~70% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of T7 DNA with 5 units of BstSN I for 16 hours.**Star activity:** High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	0-10	10-25	50-75

BstV1 I (prototype Bbv I)Isolated from *Bacillus stearothermophilus* V1**Concentration:** 1 000 - 2 000 units/ml**Assayed on** pBR322 DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer G**Reaction conditions:** 1 \times SE Buffer G

Incubate at 55°C.

Incubation at 37° results in 10% activity.

**GCAGC(N)₈^A
CGTCG(N)₁₂^A****E303
E304****100 u.a.
500 u.a.****Storage buffer:** 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with BstV1 I, > 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of the DNA with 2 units of enzyme for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	75-100	75-100	75-100

BstV2 I (prototype Bbv II)Isolated from *Bacillus stearothermophilus* V2**Concentration:** 5 000 - 15 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Buffer:**10 \times SE Buffer Y, BSA**Reaction conditions:** 1 \times SE Buffer Y+BSA

Incubate at 55°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.**GAAGAC(N)₂^A
CTTCTG(N)₆^A****E297
E298****200 u.a.
1000 u.a.****Storage buffer:** 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:**

Yes (65°C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BstV2 I, > 90% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of BstV2 I for 16 hours.**Star activity:** High enzyme concentration results in star activity.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	25-50	100

Qualified for mammalian genome studies: http://science.sibgenzyme.com/article8_article_28_1.phtml

BstX I (prototype BstX I)
Isolated from *Bacillus stearothermophilus* X

CCANNNNN^NTGG
GGTN^NNNNNACC

E465 **200 u.a.**
E466 **1000 u.a.**

Concentration: 5 000 -15 000 units/ml
Assayed on λ DNA
Reagents Supplied with Buffer:
10×SE Buffer O
Reaction conditions: 1×SE Buffer O
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstX I, > 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of BstX I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	100	75-100	25-50

BstX2 I (prototype Xho II)
Isolated from an *E.coli* strain that carries the cloned BstX2I gene from *Bacillus stearothermophilus* X2

R^GATCY
YCTAG^R

E229 **500 u.a.**
E230 **2500 u.a.**


Concentration: 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer G
Reaction conditions: 1×SE Buffer G
Incubate at 60°C.
Not blocked by overlapping *dam*-methylation (G^mATC): **RGATCY**.

Storage buffer: 10 mM Tris-HCl (pH 7.6);
100 mM NaCl; 0.1 mM EDTA; 1 mM DTT;
200 µg/ml BSA, 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with BstX2 I, > 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of BstX2 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	0-10	10-25	25-50

Bsu I (prototype BciVI)
Isolated from *Bacillus sphaericus*

 **GTATCC(N)₆**
CATAGG(N)₅

E581 **200 u.a.**
E582 **1000 u.a.**

Concentration: 2 000 – 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA;
0,05% Triton X-100, 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with BsuI 10% of the DNA fragments can be ligated with T4 DNA Ligase and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 6 units of BsuI for 16 hours at 37°C.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	10-25	25-50	100

BsuR I (prototype Hae III)
Isolated from *Bacillus subtilis* R

GG^CC
CC^GG

E053 **1000 u.a.**
E054 **5000 u.a.**

Concentration: 20 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer G
Reaction conditions: 1×SE Buffer G
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with BsuR I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of BsuR I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	50-75	50-75

Btr I (prototype Btr I)
Isolated from *Bacillus stearothermophilus* SE-U62

CAC^GTC
GTG^CAG

E277 **100 u.a.**
E278 **500 u.a.**

Concentration: 2 000 – 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer O, BSA
Reaction conditions: 1×SE Buffer O+BSA
Incubate at 60°C.
To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA;
and 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
No (65° C for 20 minutes)
Yes (80° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Btr I, 80% of the DNA fragments can be ligated. Of these, 90 % can be recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of Btr I for 16 hours.
Star activity: High enzyme concentration results in star activity.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	100	75-100	75-100

Cci I (prototype BspH I)Isolated from *Curtobacterium citreum***T[^]CATGA
AGTAC[^]T****E565
E566****1000 u.a.
5000 u.a.****Concentration:** 20000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer W, BSA**Reaction conditions:**1 \times SE Buffer W + BSA

Incubate at 55°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes (80° C for 20 minutes)****Ligation/recutting assay:** After 20-fold overdigestion with Cci I, > 90% of the DNA fragments can be ligated and recut with.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 40 units of Cci I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	25-50	100	75-100

CciN I (prototype Not I)Isolated from *Curtobacterium citreum* N**GC[^]GGCCGC
CGCCGG[^]CG****E203
E204****200 u.a.
1000 u.a.****Concentration:** 2000 –5000 units/ml**Assayed on** Ad2 DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y

Incubate at 37°C.

Blocked by CG methylation.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes (65° C for 20 minutes)****Ligation/recutting assay:** After 5-fold overdigestion with CciN I, > 95% of the DNA fragments can be ligated and recut with.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of Ad2 DNA with 10 units of CciN I for 16 hours.**Star activity:** High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	75-100	100

Dra I (prototype Aha III)Isolated from *Deinococcus radiophilus***TTT[^]AAA
AAA[^]TTT****E055
E056****1000 u.a.
5000 u.a.****Concentration:** 10 000 - 30 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer G, BSA**Reaction conditions:** 1 \times SE Buffer G+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

250 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 100 μ g/ml BSA, 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes (65° C for 20 minutes)****Ligation/recutting assay:** After 10-fold overdigestion with DraI ~70% of the DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 30 units of Dra I for 16 hours.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	75-100	75-100

Dra III (prototype Dra III)Isolated from an *E.coli* strain that carries the cloned DraIII gene from *Deinococcus radiophilus***CACNNN[^]GTG
GTG[^]NNNCAC****E309
E310****500 u.a.
2500 u.a.****Concentration:** 5 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer 2K, BSA**Reaction conditions:** 1 \times SE Buffer 2K+BSA

Incubate at 37°C.

*To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.***Storage buffer:** 10 mM Tris-HCl (pH 7.5);

300 mM NaCl; 0.1 mM EDTA;

1 mM DTT; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes (65° C for 20 minutes)****Ligation/recutting assay:** After 5-fold overdigestion with Dra III, about 70% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of DraIII for 16 hours.**Star activity:** High concentration of enzyme may result in star activity.**Do not use** BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	75-100	50-75

Dri I (prototype Eam1105 I)Isolated from *Deinococcus radiophilus* EA**GACNNN[^]NNGTC
CTGNN[^]NNNCAG****E193
E194****200 u.a.
1000 u.a.****Concentration:** 5 000 -10 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**10 \times SE Buffer Y**Reaction conditions:** 1 \times SE Buffer Y

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

250 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A**Heat inactivation:****Yes (65° C for 20 minutes)****Ligation/recutting assay:** After 5-fold overdigestion with DriI, about 5% of the DNA fragments can be ligated. In the presence of 10% PEG ligation is better.**Overdigestion assay:** No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Dri I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	10-25	10-25	100

DseD I (prototype Drd I)

Isolated from *Deinococcus* species D2

GACNNNN[^]NNGTC
CTGNN[^]NNNNCAG

E241 500 u.a.
E242 2500 u.a.

Concentration: 10 000 – 30 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y, BSA

Reaction conditions: 1×SE Buffer Y+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65°C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with DseD I, > 90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of

1 µg of λ DNA with 10 units of DseD I
for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	50-75	100

EcoICR I (prototype Sac I)

Isolated from *Escherichia coli* ICR

GAG[^]CTC CTC[^]GAG

E469 200 u.a.
E470 1000 u.a.

Concentration: 2 000 - 10 000 units/ml

Assayed on λ DNA (Hind III-digest)

Reagents Supplied with Enzyme:

10×SE Buffer G, BSA

Reaction conditions: 1×SE Buffer G+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

EcoICRI is a neoschizomer of SacI.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol, 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with EcoICR I, > 95% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 10 units of EcoICR
I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	0-10	0-10	75-100

EcoR I (prototype EcoR I)

Isolated from an *E.coli* strain that carries the
cloned EcoR I gene from *Escherichia coli*



G[^]AATTC
CTTAA[^]G

E057 5000 u.a.
E058 25000 u.a.

For high concentration

E057X 5000 u.a.
E058X 25000 u.a.

Concentration: 20 000 and 50 000 units/ml
Assayed on λ DNA

Reagents Supplied with Enzyme:

5×SE Buffer EcoR I, BSA

Reaction conditions:

1×SE Buffer EcoRI+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 50-fold
overdigestion with EcoR I, 95% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 40 units of EcoR I
for 16 hours.

Star activity: High concentration of
enzyme results in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	75-100	75-100	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

EcoR V (prototype EcoR V)

Isolated from an *E.coli* strain that carries the
cloned EcoR V gene from *Escherichia coli*

GAT[^]ATC
CTA[^]TAG

E059 2000 u.a.
E060 10000 u.a.

Concentration: 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer W, BSA

Reaction conditions: 1×SE Buffer W+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0,1 mM EDTA; 1 mM DTT;

200 µg/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with EcoR V, 90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of EcoR V
for 16 hours.

Star activity: High enzyme
concentration results in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	25-50	50-75	100	25-50

Ege I (prototype Nar I)

Isolated from *Enterobacter gergoviae*

GGC[^]GCC
CCG[^]CGG

E243
E244

200 u.a.
1000 u.a.

Concentration: 5 000 – 10 000 units/ml

Assayed on λ DNA (HindIII-digest)

Reagents Supplied with Enzyme:

10×SE Buffer B, BSA

Reaction conditions: 1×SE Buffer B+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

EgeI is a neoschizomer of NarI.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

250 mM NaCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold

overdigestion with Ege I, 70% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of the DNA with 10 units of Ege I

for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	10-25	50-75	75-100

Erh I (prototype Sty I)

Isolated from *Erwinia rhapsontici*

C[^]CWWGG
GGWWC[^]C

E061
E062

1000 u.a.
5000 u.a.

Concentration: 10 000 - 50 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer 2W, BSA

Reaction conditions:

1 ×SE Buffer 2W+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA,

50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold

overdigestion with Erh I, 95% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 50 units of ErhI for

16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	25-50	75-100	10-25

Fae I (prototype Nla III)

Isolated from *Flavobacterium aquatile* N3

CATG[^]
^GTAC

E495
E496

50 u.a.
250 u.a.

Concentration: 500 - 2 000 units/ml

Assayed on pUC19 DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y, BSA

Reaction conditions: 1 ×SE Buffer Y+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Blocked by C^mATG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;

50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold

overdigestion with Fae I, >90% of the

DNA fragments can be ligated with T4

DNA Ligase and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of pUC19 DNA with 1 units of Fae

I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	10-25	10-25	100

Fai I (prototype Fai I)

Isolated from *Flavobacterium aquatile* B15

YA[^]TR
RT[^]AY

E551
E552

50 u.a.
250 u.a.

Fai I cleaves 4 expected recognition sites as well as several other sites with a weaker activity

Concentration: 1 000 units/ml

One unit is defined as the amount of enzyme required to cleave 1 pmol of the double-stranded oligonucleotide with the following structure

5'- CGAGTTCA[^]TAGCTGGGCCCAAC -3'

3'- GCTCAAGT[^]ATCGACCCGGGTTG -5'

in 1 hour at 50°C in a total reaction volume of 20 µl.

Reagents Supplied with Enzyme:

10×SE Buffer B

Reaction conditions: 1 ×SE Buffer B

Incubate at 50°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;

50% glycerol. Store at -20°C.

Heat inactivation:

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 3-fold

overdigestion with Fai I, about 90% of

the pUC19 DNA fragments can be

ligated with DNA Ligase and recut.

Overdigestion assay: Fai I overnight

digestion greatly enhances the star

activity. DNA can be digested to small

oligos under "star" conditions.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	25-10	25-50

Fal I (prototype Fal I)

Isolated from *Flavobacterium aquatile* Ob10

Concentration: 1 000 - 3 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer W, SAM

Reaction conditions:

1 \times SE Buffer W+SAM

Incubate at 37°C.

To obtain 100% activity, SAM should be added to a final concentration 0.01 mM.

$^{(N)_8}AAGN_5CTT(N)_{13}^{(N)_8}$
 $^{(N)_{13}}TTCN_5GAA(N)_8^{(N)_8}$

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

E153 100 u.a.
E154 500 u.a.

Ligation/recutting assay: After 3-fold overdigestion with Fal I, 20% of the DNA fragments can be ligated. Of these, 80 % can be recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of Fal I for 16 hours.

Star activity: High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	25-50	75-100	100	50-75

Fat I (prototype Nla III)

Isolated from an *E.coli* strain that carries the cloned Fat I gene from

Flavobacterium aquatile NL3



CATG
 GTAC

E155 100 u.a.
E156 500 u.a.

Concentration: 2 000 - 5 000 units/ml

Assayed on DNA pUC19

Reagents Supplied with Enzyme:

10 \times SE Buffer G

Reaction conditions: 1 \times SE Buffer G

Incubate at 55°C.

FatI is a neoschizomer of NlaIII.

Blocked by m CATG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA; 1 mM DTT;
200 μ g/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Fat I, > 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of the DNA with 3 units of Fat I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	100	25-50	10-25	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Fau I (prototype Fau I)

Isolated from an *E.coli* strain that carries the cloned Fau I gene from *Flavobacterium aquatili*

$^{CCCGC(N)_4}$
 $^{GGGCG(N)_6}$

E209 100 u.a.
E210 500 u.a.

Concentration: 2 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer B

Reaction conditions: 1 \times SE Buffer B

Incubate at 55°C.

Blocked by CG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0.1 mM EDTA; 1 mM DTT;
200 μ g/ml BSA and 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Fau I, > 90% of the DNA fragments can be ligated. Of these, 95 % can be recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 4 units of Fau I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	25-50	0-10	0-10	50-75

FauND I (prototype Nde I)

Isolated from an *E.coli* strain that carries the cloned FauND I gene from

Flavobacterium aquatili ND



$^{CA^TATG}$
 $^{GTAT^AC}$

E009 1000 u.a.
E010 5000 u.a.

Concentration: 10 000 - 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y, BSA

Reaction conditions: 1 \times SE Buffer Y+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA; 1mM DTT;
200 μ g/ml BSA, 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with FauND I, 80% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of FauND I for 16 hours.

Note: Sensitive to impurities present in some DNA preparations. For example, DNA purified by standard miniprep procedures is cleaved at lower rate.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	10-25	50-75	100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

Fbl I (prototype Acc I)

Isolated from an *E.coli* strain that carries the cloned Fbl I gene from *Flavobacterium balustinum*

GT[^]MKAC
CAKM[^]TG

E271
E272

100 u.a.
500 u.a.

Concentration: 1 000 – 2 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
Incubate at 55°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Fbl I, 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 2 units of Fbl I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	0-10	50-75	100

Fok I (prototype Fok I)

Isolated from an *E.coli* strain that carries the cloned Fok I gene from *Flavobacterium okeanoikoites*

GGATG(N)₉[^]
CCTAC(N)₁₃[^]

E247
E248

100 u.a.
500 u.a.

Concentration: 1 000 – 2 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y
Reaction conditions: SE Buffer Y
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0.1 mM EDTA; 1 mM DTT ;
200 µg/ml BSA, 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Fok I, > 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 1 units of Fok I for 16 hours.
Note: Overdigestions of > 5 units of Fok I per 1µg of DNA and incubation times > 2 hours are not recommended.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	25-50	25-50	100

FriO I (prototype Ban II)

Isolated from *Flavobacterium rigense* O

GRGCY[^]C
C[^]YCGRG

E157
E158

1000 u.a.
5000 u.a.

Concentration: 10 000 - 40 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y, BSA
Reaction conditions: 1×SE Buffer Y+BSA
Incubate at 37°C.
To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with FriO I, 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 40 units of FriOI for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	10-25	0-10	100

Fsp4H I (prototype Fnu4H I)

Isolated from *Flavobacterium* species 4H



GC[^]NGC
CGN[^]CG

E095
E096

100 u.a.
500 u.a.

Concentration: 1 000 – 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y
Reaction conditions: 1× SE Buffer Y
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Fsp4H I, about 5% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 4 units of Fsp4H I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	10-25	25-50	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Gla I (prototype Glal I)

Isolated from *Glacial ice bacterium* GL 29

G(5mC)[^]G(5mC)
(5mC)G[^](5mC)G

E493
E494

100 u.a.
500 u.a.

See page 48 for more information about this enzyme.

Glu I (prototype GluI I)

Isolated from *Glacial ice bacterium* GL 24

(5mC)G(5mC)[^]NG(5mC)G
G(5mC)GN[^](5mC)G(5mC)

E519
E520

100 u.a.
500 u.a.

See page 48 for more information about this enzyme.

Gsa I (prototype BseY I)

Isolated from *Geobacillus stearothermophilus* Y

CCCAG[^]C
G[^]GGTCC

E563
E564

1000 u.a.
5000 u.a.

Concentration: 10 000-20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer W, BSA

Reaction conditions: 1×SE Buffer W+BSA

Incubate at 70°C.

To obtain 100% activity, BSA should be

added to the 1× reaction mix to a final

concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;

50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold

overdigestion with Gsa I, > 90% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 20 units of Gsa I for

16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	75-100	100	75-100

Hae III (prototype Hae III)

Isolated from an *E.coli* strain that carries the cloned Hae III gene from *Haemophilus aegyptius*



GG[^]CC
CC[^]GG

E067
E068

2000 u.a.
10000 u.a.

Concentration: 10 000 and 50 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer G

Reaction conditions: 1× SE Buffer G

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0.1 mM EDTA; 1 mM DTT;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold

overdigestion with Hae III, > 90% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 20 units of Hae III

for 16 hours.

For high concentration

E067X 2000 u.a.

E068X 10000 u.a.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	50-75	50-75

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_27_1.phtml

Hga I (prototype Hga I)

Isolated from *E.coli* strain that carries the cloned HgaI gene from *Haemophilus gallinarum*

GACGC(N)₅[^]
CTGCG(N)₁₀[^]

E461
E462

50 u.a.
250 u.a.

Concentration: 1 000 units/ml

Assayed on pBR322 DNA

Reagents Supplied with Enzyme:

10×SE Buffer B

Reaction conditions: 1× SE Buffer B

Incubate at 37°C.

Blocked by CG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM NaCl; 0.1 mM EDTA; 1 mM DTT;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold

overdigestion with Hga I, > 90% of the

DNA fragments can be ligated and recut.

Note: Incubation with >2 units of HgaI

per 1 µg of DNA and digestion > 1 hour

is not recommended.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	10-25	25-50	50-75

Hind II (prototype Hind II)

Isolated from an *E.coli* strain that carries the cloned Hind II gene from *Haemophilus influenzae* Rd

GTY[^]RAC
CAR[^]YTG

E201
E202

1000 u.a.
5000 u.a.

Concentration: 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer G, BSA

Reaction conditions: 1×SE Buffer G+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be

added to the 1× reaction mix to a final

concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

200 mM NaCl; 0.1 mM EDTA; 1 mM DTT;

200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold

overdigestion with Hind II, > 60% of the

DNA fragments can be ligated and recut.

In the presence of 10% PEG ligation is

better.

Overdigestion assay: No nonspecific

activity was detected after incubation of

1 µg of λ DNA with 20 units of Hind II

for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	25-50	75-100



New product



Mammalian Genome Qualified



New package

Hind III (prototype Hind III)

Isolated from an *E.coli* strain that carries the cloned Hind III gene from *Haemophilus influenzae* Rd



A[^]AGCTT
TTCGA[^]A

E073
E074

5000 u.a.
25000 u.a.

For high concentration

E073X 5000 u.a.
E074X 25000 u.a.

Concentration: 20 000 and 100 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer W, BSA

Reaction conditions:

1 ×SE Buffer W+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article28_1.phtml

Storage buffer: 10 mM Tris-HCl (pH 7.5); 250 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 50-fold overdigestion with Hind III, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 40 units of Hind III for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	0-10	100	0-10

Hinf I (prototype Hinf I)

Isolated from an *E.coli* strain that carries the cloned Hinf I gene from *Haemophilus influenzae*



G[^]ANTC
CTNA[^]G

E075
E076

2000 u.a.
10000 u.a.

For high concentration

E076X 10000 u.a.

Concentration: 20 000 and 40 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer O

Reaction conditions: 1× SE Buffer O

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 200 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation :

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Hinf I, > 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 40 units of Hinf I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	75-100	100	75-100	75-100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article31_1.phtml

Hpa I (prototype Hpa I)

Isolated from an *E.coli* strain that carries the cloned Hpa I gene from *Haemophilus parainfluenzae*

GTT[^]AAC
CAA[^]TTG

E077
E078

500 u.a.
2500 u.a.

Concentration: 5 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y

Reaction conditions: 1× SE Buffer Y

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 200 µg/ml BSA, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Hpa I, 60% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 5 units of Hpa I for 16 hours.

Star activity: High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	50-75	10-25	25-50	100

Hpa II (prototype Hpa II)

Isolated from an *E.coli* strain that carries the cloned Hpa II gene from *Haemophilus parainfluenzae*



C[^]CGG
GGC[^]C

E161
E162

500 u.a.
2500 u.a.

Concentration: 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer B

Reaction conditions: 1×SE Buffer B

Incubate at 37°C.

Blocked by CG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 100 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Hpa II, > 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Hpa II for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	25-50	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article28_1.phtml

HspA I (prototype Hha I)

Isolated from an *E.coli* strain that carries the cloned HspA I gene from *Haemophilus* species A1



G[^]CGC
CGC[^]G

E069
E070

1000 u.a.
5000 u.a.

Concentration: 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:
10×SE Buffer Y

Reaction Conditions: 1× SE Buffer Y
Incubate at 37°C.

Blocked by CG methylation
5'-G(5mC)GC-3'/3'-CG(5mC)G-5'.

Not blocked by methylation

5'-GCG(5mC)-3'/3'-CGCG-5' or
5'-GCG(5mC)-3'/3'-(5mC)GCG-5'.

HspAI is a neoschizomer of HhaI.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with HspA I, > 90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of HspA I
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	25-50	25-50	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Kpn I (prototype Kpn I)

Isolated from an *E.coli* strain that carries the cloned Kpn I gene from *Klebsiella pneumonia*



GGTAC[^]C
C[^]CATGG

E079
E080

2000 u.a.
10000 u.a.

Concentration: 20 000 and 40 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:
10×SE Buffer B, BSA

Reaction conditions: 1×SE Buffer B+BSA
Incubate at 37°C.

*To obtain 100% activity, BSA should be
added to the 1× reaction mix to a final
concentration of 100 µg/ml.*

Not blocked by overlapping *dcm*-methylation
(C^mCWGG): **GGTACCWGG**.

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0.1 mM EDTA; 1 mM DTT ;
200 µg/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with Kpn I, > 90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of Kpn I
for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	25-50	25-50	25-50	75-100

Kro I (prototype Kro I)

Isolated from *Kocurea rosea* 307



G[^]C(5mC)GGC
CGG(5mC)C[^]G

E541
E542

50 u.a.
250 u.a.

See page 49 for more information about this enzyme.

Ksp22 I (prototype Bcl I)

Isolated from *Kurthia* species 22



T[^]GATCA
ACTAG[^]T

E081
E082

1000 u.a.
5000 u.a.

Concentration: 10 000 - 30 000 units/ml

Assayed on λ DNA (dam-)

Reagents Supplied with Enzyme:
10×SE Buffer 2K, BSA

Reaction conditions: 1×SE Buffer 2K+BSA
Incubate at 37°C.

*To obtain 100% activity, BSA should be
added to the 1× reaction mix to a final
concentration of 100 µg/ml.*

Blocked by overlapping *dam*-methylation
(G^mATC): **TGATCA**.

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
overdigestion with Ksp22 I, >90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of Ksp22 I
for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	50-75	50-75	25-50



New product



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New package

Kzo9 I (prototype Mbo I)

Isolated from *Kurthia zopfii* 9



[^]GATC
CTAG[^]

E187
E188

200 u.a.
1000 u.a.

Concentration: 1 000 – 5 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer G

Reaction conditions: 1 \times SE Buffer G

Incubate at 37°C.

Not blocked by overlapping

dam-methylation (G^mATC): **GATC**.

Blocked by CG methylation.

Cleaved of DNA is impaired by overlapping

CG methylation: **GAT^mCG**.

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_27_1.phtml

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
and 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with Kzo9 I,

> 95% of the DNA fragments can be
ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 2 units of Kzo9I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	50-75	50-75	50-75

Mab I (prototype SexA I)

Isolated from *Microbacterium arborescens* SE

A[^]CCWGGT
TGGWCC[^]A

E121
E122

200 u.a.
1000 u.a.

Concentration: 1 000 – 5 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer W, BSA

Reaction conditions: 1 \times SE Buffer W+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be

added to the 1 \times reaction mix to a final

concentration of 100 μ g/ml.

Not blocked by overlapping *dcm*-

methylation (C^mC(A/T)GG): **ACCWGGT**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with Mab I, 90% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 10 units of Mab I
for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	75-100	100	50-75

Mal I (prototype Dpn I)

Isolated from *Marinococcus albus* I

G(mA)[^]TC
CT[^](mA)G

E489
E490

50 u.a.
250 u.a.

The enzyme cleaves only methylated DNA

Concentration: 500 - 1 000 units/ml

Assayed on

pBR322 DNA (*dam*-methylated)

Reagents Supplied with Enzyme:

10 \times SE Buffer Mal I

Reaction conditions: 1 \times SE Buffer Mal I

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 100 μ g/ml BSA,
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold
overdigestion with Mal I, ~80% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 2 units of Mal I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	50-75	75-100	50-75

Mbo II (prototype Mbo II)

Isolated from an *E.coli* strain that carries the
cloned Mbo II gene from *Moraxella bovis*

GAAGA(N)₈[^]
CTTCT(N)₇[^]

E471
E472

200 u.a.
1000 u.a.

Concentration: 5 000 units/ml

Assayed on λ DNA (*dam*⁻)

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 37°C.

Blocked by overlappin *dam*-methylation

(G^mATC): **GAAGATC**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0,1 mM EDTA; 1 mM DTT;

200 μ g/ml BSA;50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with Mbo II, 60% of the

DNA fragments can be ligated and recut.

In presence of 10% PEG ligation is
better.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 μ g of DNA with 5 units of enzyme for
16 hours at 37°C.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	50-75	100

Mhl I (prototype Sdu I)

Isolated from *Micrococcus halobius* SD

GDGCH[^]C
C[^]HCGDG

E049
E050

500 u.a.
2500 u.a.

Concentration: 5 000 – 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer W

Reaction conditions: 1 \times SE Buffer W

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol.

Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 10-fold
overdigestion with Mhl I, >90% of the

DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 10 units of Mhl I
for 16 hours.

Star activity: High enzyme
concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	75-100	100	10-25

Mlu I (prototype Mlu I)
Isolated from *Micrococcus luteus*

Concentration: 10 000 – 30 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme: 10×SE Buffer O
Reaction conditions: 1× SE Buffer O
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Mlu I, 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Mlu I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	100	25-50	10-25

Mly113 I (prototype Nar I)
Isolated from *Micrococcus lylae* 113

Concentration: 3 000 – 5 000 units/ml
Assayed on T7 DNA
Reagents Supplied with Enzyme: 10×SE Buffer B
Reaction conditions: 1× SE Buffer B
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Mly113 I, > 80% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of T7 DNA with 10 units of Mly113 I for 16 hours.
Star activity: High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	25-50	10-25	10-25	50-75

Mnl I (prototype Mnl I)
Isolated from an *E.coli* strain that carries the cloned MnlI gene from *Moraxella nonliquefaciens*

Concentration: 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme: 10×SE Buffer G, BSA
Reaction conditions: 1×SE Buffer G+BSA
Incubate at 37°C.
To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.
Blocked by overlapping CG methylation: CCT^mCG.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 200 µg/ml BSA, 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Mnl I, about 50% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Mnl I for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	25-50	75-100

MroN I (prototype Nae I)
Isolated from *Micrococcus roseus* NO

Concentration: 2 000 – 10 000 units/ml
Assayed on Adenovirus-2 DNA
Reagents Supplied with Enzyme: 10×SE Buffer B
Reaction conditions: 1×SE Buffer B
Incubate at 37°C.
MroNI is a neoschizomer of NaeI.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 250 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: No (65°C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with MroN I, > 90% of the Ad-2 DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of Ad-2 DNA with 5 units of MroN I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	0-10	10-25

MroX I (prototype Xmn I)
Isolated from *Micrococcus roseus* X

Concentration: 5 000 - 15 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme: 10×SE Buffer W
Reaction mixture: 1×SE Buffer W
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation: Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with MroX I, 50% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of MroX I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	50-75	100	25-50

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

Msp I (prototype Hpa II)

Isolated from *Moraxella* species



C[^]CGG
GGC[^]C

E091
E092

1000 u.a.
5000 u.a.

Concentration: 10 000 - 20 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer B
Reaction conditions: 1 \times SE Buffer B
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Msp I, 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of DNA with 20 units of Msp I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	50-75	75-100	75-100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_27_1.phtml

Msp20 I (prototype Bal I)

Isolated from *Micrococcus* species 20



TGG[^]CCA
ACC[^]GGT

E301
E302

100 u.a.
500 u.a.

Concentration: 1 000 - 3 000 units/ml
Assayed on λ DNA (dcm-)

Reagents Supplied with Enzyme:
10 \times SE Buffer W, BSA

Reaction conditions: 1 \times SE Buffer W+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Blocked by overlapping dcm-methylation (C^mCWGG) : **TGGCCAGG**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Msp20 I, 80% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 2 units of Msp20 I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	25-50	100	50-75

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

MspA1 I (prototype NspB II)

Isolated from *Moraxella* species A1

CMG[^]CKG
GKC[^]GMC

E191
E192

500 u.a.
2500 u.a.

Concentration: 2 000 - 10 000 units/ml
Assayed on λ DNA

Reagents Supplied with Enzyme:
10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y
Incubate at 37°C.

Storage buffer: 20 mM Tris-HCl (pH 7.6);
300 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 10 mM MgCl₂,
200 μ g/ml BSA, 50% glycerol.
Store at -20°C (*see note).

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with MspA1 I, 60% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of MspA1 I for 16 hours.

***Note: Store For long term storage (more than 30 days), store at -70°C .**

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	75-100	10-25	25-50	100

MspR9 I (prototype ScrF I)

Isolated from *Moraxella* species R9



CC[^]NGG
GGN[^]CC

E175
E176

1000 u.a.
5000 u.a.

Concentration: 10 000 - 20 000 units/ml
Assayed on λ DNA (dcm-)

Reagents Supplied with Enzyme:
10 \times SE Buffer O

Reaction conditions: 1 \times SE Buffer O
Incubate at 37°C.

Blocked by overlapping dcm-methylation (C^mCWGG): **CCWGG**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 100 μ g/ml BSA;
50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with MspR9 I none of the DNA fragments can be ligated.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 30 units of MspR9 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	100	50-75	75-100

Nru I (prototype Nru I)

Isolated from *Nocardia rubra*

TCG[^]CGA
AGC[^]GCT

E099
E100

500 u.a.
2500 u.a.

Concentration: 5 000 - 10 000 units/ml
Assayed on λ DNA (dam-)

Reagents Supplied with Enzyme:
10 \times SE Buffer W

Reaction conditions: 1 \times SE Buffer W
Incubate at 37°C.

Blocked by overlapping dam-methylation (G^mATC): **TCGCGATC**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Nru I, 20% of the DNA fragments can be ligated. Of these, 90% can be recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of Nru I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	75-100	100	10-25



PalA I (prototype Asc I)Isolated from *Pseudomonas alcaligenes* BS17**GG[^]CGCGCC
CCGCGC[^]GG****E483
E484****100 u.a.
500 u.a.****Concentration:** 500 – 2 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer Y**Reaction condition:** 1 \times SE Buffer Y
Incubate at 37°C.**Blocked** by CpG methylation.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);
100 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA,
50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 2-fold
overdigestion with PalAI,
> 90% of the DNA fragments can be
ligated and recut.**Overdigestion assay:** No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 2 units of PalAI
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	10-25	0	0	100

Pce I (prototype Stu I)Isolated from *Planococcus citreus* 55**AGG[^]CCT
TCC[^]GGA****E105
E106****1000 u.a.
5000 u.a.****Concentration:** 10 000 – 20 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer Y**Reaction Condition:** 1 \times SE Buffer Y
Incubate at 50°C.

Incubation at 37°C results in 50% activity.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 100 μ g/ml BSA;
50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat inactivation:****No** (65° C for 20 minutes)**Yes** (80° C for 20 minutes)**Ligation/recutting assay:** After 10-fold
overdigestion with Pce I 70% of the
DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 20 units of Pce I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	50-75	25-50	100

Pci I (prototype BspLU11 I)Isolated from an *E.coli* strain that carries the
cloned Pci I gene from *Planococcus citreus* SE-
F45**A[^]CATGT
TGTAC[^]A****E275
E276****300 u.a.
1500 u.a.****Concentration:** 10 000 units/ml**Assayed on** T7 DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer O**Reaction conditions:** 1 \times SE Buffer O
Incubate at 37°C.**Blocked** by ^mACATGT methylation.**Not blocked** by AC^mATGT methylation.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; and 50% glycerol.
Store at -20°C.**Diluent:** SE Buffer A**Heat Inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 10-fold
overdigestion with Pci I, 90% of the
DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific
activity was detected after incubation of
1 μ g of T7 DNA with 20 units of Pci I
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	100	75-100	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml**PciS I (prototype Sap I)**Isolated from *Planococcus citreus* S**GCTCTTC(N)₁[^]
CGAGAAG(N)₄[^]****E497
E498****50 u.a.
250 u.a.****Concentration:** 500 - 2 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer B**Reaction conditions:** 1 \times SE Buffer B
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat Inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 3-fold
overdigestion with PciS I, 90% of the
DNA fragments can be ligated with T4
DNA Ligase at 16°C and 95% of these
can be recut.**Overdigestion assay:** No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 1 units of PciS I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	0-10	0-10	75-100

Pcs I (prototype Pcs I)Isolated from *Paracoccus carotinifaciens* 3K**W(5mC)GNNNN[^]NNN(5mC)GW
WG(5mC)NNN₁NNNNG(5mC)W****E505
E506****50 u.a.
250 u.a.****See page 49 for more information about this enzyme.****Pct I (prototype Bsm I)**Isolated from *Planococcus citreus* SM**GAATGCN[^]
CTTAC[^]GN****E045
E046****1000 u.a.
5000 u.a.****Concentration:** 10 000 - 40 000 units/ml**Assayed on** λ DNA**Reagents Supplied with Enzyme:**
10 \times SE Buffer O**Reaction conditions:** 1 \times SE Buffer O
Incubate at 37°C.**Storage buffer:** 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 100 μ g/ml BSA;
50% glycerol. Store at -20°C.**Diluent:** SE Buffer A**Heat Inactivation:****Yes** (65° C for 20 minutes)**Ligation/recutting assay:** After 20-fold
overdigestion with Pct I, 90% of the
DNA fragments can be ligated and recut.**Overdigestion assay:** No nonspecific
activity was detected after incubation of
1 μ g of λ DNA with 20units of Pct I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	100	75-100	10-25

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

New product



Mammalian Genome Qualified



New package

Ple19 I (prototype Pvu I)

Isolated from *Pseudomonas lemoignei* 19

Concentration: 2 000 - 5 000 units/ml
Assayed on λ DNA (Hind III-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer Y
Reaction conditions: 1 \times SE Buffer Y
Incubate at 37°C.
Not blocked by overlapping *dam*-methylation (G^mATC): **CGATCG**.

CGAT[^]CG
GC[^]TAGC

E195
E196

100 u.a.
500 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Ple19 I, 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of Ple19 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	25-50	100

Pps I (prototype Ple I)

Isolated from *Pseudomonas pseudoalcaligenes*

Concentration: 500 – 1 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer Y, BSA
Reaction conditions: 1 \times SE Buffer Y+BSA
Incubate at 37°C.
To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

GAGTC(N)₄[^]
CTCAG(N)₅[^]

E269
E270

25 u.a.
125 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA ,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Pps I, 20% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 2 unit of Pps I for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	10-25	0-10	25-50	100

Psi I (prototype Psi I)

Isolated from *Pseudomonas* species SE-G49



TTA[^]TAA
AAT[^]ATT

E279
E280

200 u.a.
1000 u.a.

Concentration: 5 000 - 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer B
Reaction conditions: 1 \times SE Buffer B
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Psi I, about 50% of the DNA fragments can be ligated. Of these, 95% can be recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Psi I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	25-50	10-25	25-50	75-100

Psp124B I (prototype Sac I)

Isolated from *Pseudomonas* species 124B

Concentration: 10 000 - 30 000 units/ml
Assayed on λ DNA (Hind III-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer G
Reaction mixture: 1 \times SE Buffer G
Incubate at 37°C.

GAGCT[^]C
C[^]TCGAG

E107
E108

1000 u.a.
5000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 100 μ g/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Psp124B I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Psp124B I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	10-25	0-10	75-100

Psp6 I (prototype EcoR II)

Isolated from *Pseudomonas* species 6

Concentration: 1 000 – 3 000 units/ml
Assayed on λ DNA (dcm-)
Reagents Supplied with Enzyme:
10 \times SE Buffer B
Reaction conditions: 1 \times SE Buffer B
Incubate at 55°C.
Blocked by overlapping *dcm*-methylation (C^mCWGG): **CCWGG**.

[^]CCWGG
GGWCC[^]

E453
E454

100 u.a.
500 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM KCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
No (65° C for 20 minutes)
Yes (80° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with Psp6 I, 95% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 6 units of Psp6 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	25-50	75-100

PspC I (prototype PmaC I)

Isolated from *Pseudomonas* species C

Concentration: 10 000 - 30 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer B, BSA

Reaction conditions: 1 \times SE Buffer B+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

CAC[^]GTG
GTG[^]CAC

E475
E476

2000 u.a.
10000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

10 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C (*see note).

Diluent: SE Buffer A

Heat Inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with PspC I, > 90% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 40 units of PspC I for 16 hours.

Do not use BSA for long incubation.

***Note: For long term storage (more than 30 days), store at -70°C .**

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	0	0	50-75

PspE I (prototype BstE II)

Isolated from *Pseudomonas* species E

Concentration: 5 000 - 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer B

Reaction conditions: 1 \times SE Buffer B

Incubate at 37°C.

G[^]GTNACC
CCANTG[^]G

E169
E170

2000 u.a.
10000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with PspE I >90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 10 units of PspE I for 16 hours.

Star activity: High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	25-50	50-75	50-75

PspL I (prototype Spl I)

Isolated from *Pseudomonas* species L



C[^]GTACG
GCATG[^]C

E223
E224

200 u.a.
1000 u.a.

Concentration: 2 000 - 5 000 units/ml

Assayed on λ DNA (HindIII-digest)

Reagents Supplied with Enzyme:

10 \times SE Buffer Y, BSA

Reaction conditions: 1 \times SE Buffer Y+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 100 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with PspL I, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 2 units of PspL I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	25-50	10-25	100

PspN4 I (prototype Nla IV)

Isolated from *Pseudomonas* species N4

Concentration: 10 000 - 30 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 37°C.

Blocked by methylation

5'-GGNN(5mC)C-3'/3'-C(5mC)NNGG-5' or

5'-GGNN(5mC)C-3'/3'-CCNNGG-5'

GGN[^]NCC
CCN[^]NGG

E089
E090

1000 u.a.
5000 u.a.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with PspN4 I, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 30 units of PspN4 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	10-25	25-50	100

PspOM I (prototype Apa I)

Isolated from an *E.coli* strain that carries the cloned PspOM I gene from *Pseudomonas* species OM2164

Concentration: 10 000 units/ml

Assayed on λ DNA (Bam HI-digest)

Reagents Supplied with Enzyme:

10 \times SE Buffer Y

Reaction conditions: 1 \times SE Buffer Y

Incubate at 37°C

PspOMI is a neoschizomer of ApaI.

G[^]GGCCC CCCGG[^]G

E215
E216

1500 u.a.
7500 u.a.

Storage buffer: 20 mM Tris-HCl (pH 7.5);

50 mM NaCl; 0.1 mM EDTA; 1 mM DTT;

200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with PspOM I, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of PspOM I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	10-25	0-10	0-10	100



New product



Mammalian Genome Qualified



New package

PspPP I (prototype PpuM I)

Isolated from *Pseudomonas* species PP

RG[^]GWCCY
YCCWG[^]GR

E255
E256

100 u.a.
500 u.a.

Concentration: 2 000 - 5 000 units/ml
Assayed on λ DNA (dcm-,HindIII-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer Y, BSA
Reaction conditions: 1 \times SE Buffer Y+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Blocked by overlapping *dcm*-methylation (C^mCWGG): **RGGW^CCTGG**.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with PspPP I, >70% of the DNA fragments can be ligated and 80% of these can be recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of PspPP I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	0	0-10	100

Psp X I (prototype PspX I)

Isolated from an *E.coli* strain that carries the cloned PspX I gene from *Pseudomonas* species A1-1

VC[^]TCGAGB
BGAGCT[^]CV

E477
E478

200 u.a.
1000 u.a.

For high concentration

E478X 1000 u.a.

Concentration: 10 000 and 50 000 units/ml
Assayed on λ DNA (HindIII-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer Y, BSA
Reaction conditions: 1 \times SE Buffer Y+BSA.
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol, 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with PspX I, > 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of PspXI for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	50-75	25-50	75-100	100

Psr I (prototype Psr I)

Isolated from *Pseudomonas stutzeri* N2

[^](N)₇GAAC(N)₆TAC(N)₁₂[^]
[^](N)₁₂CTTG(N)₆ATG(N)₇[^]

E131
E132

100 u.a.
500 u.a.

Concentration: 1 000 – 3 000units/ml
Assayed on T7 DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer Y, BSA
Reaction mixture: 1 \times SE Buffer Y+BSA
Incubate at 30°C.

Incubation at 37°C results in 20% activity.
To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Psr I, > 70% of the DNA fragments can be ligated. Of these, 80% of these can be recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of T7 DNA with 2 units of Psr I for 16 hours.

Star activity: High enzyme concentration may result in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	0	0-10	100

Pst I (prototype Pst I)

Isolated from an *E.coli* strain that carries the cloned PstI gene from *Providencia stuartii*

CTGCA[^]G
G[^]ACGTC

E109
E110

4000 u.a.
20000 u.a.

For high concentration

E109X 4000 u.a.

E110X 20000 u.a.

Concentration: 20 000 and 50 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer O, BSA
Reaction conditions: 1 \times SE Buffer O+BSA
Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0,1 mM EDTA; 7 mM 2-mercaptoethanol; 200 μ g/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)


Ligation/recutting assay: After 20-fold overdigestion with Pst I, > 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 40 units of Pst I for 16 hours.

Star activity: High enzyme concentration may result in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	25-50	25-50


PstN I (prototype AlwN I)  **CAGNNN[^]CTG** **E571** **500 u.a.**
GTC[^]NNNGAC **E572** **2500 u.a.**
 Isolated from *Bacillus sphaericus*

Concentration: 5 000 – 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
 Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 100 mM NaCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol; 200 µg/ml BSA;
 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with PstNI > 95% of Lambda DNA fragments can be ligated with T4 DNA Ligase and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of PstNI for 16 hours at 37°C.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	50-75	10-25	25-50	100

Pvu II (prototype Pvu II)  **CAG[^]CTG** **E111** **2000 u.a.**
GTC[^]GAC **E112** **10000 u.a.**
 Isolated from an *E.coli* strain that carries the cloned Pvu II gene from *Proteus vulgaris*

Concentration: 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with enzyme:
 10×SE Buffer G, BSA
Reaction conditions: 1× SE Buffer G+BSA
 Incubate at 37°C.
To obtain 100% activity, BSA should be added to the 1×reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 300 mM NaCl; 0,1 mM EDTA;
 7 mM 2-mercaptoethanol; 100 µg/ml BSA;
 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Pvu II, 70% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Pvu II for 16 hours.
Star activity: High enzyme concentration may result in star activity.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	100	25-50	25-50	25-50

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Rga I (prototype Sgf I) **GCGAT[^]CGC** **E491** **200 u.a.**
CGC[^]TAGCG **E492** **1000 u.a.**
 Isolated from *Rhizobium galegae*

Concentration: 5 000 - 10 000 units/ml
Assayed on Ad2 DNA
Reagents Supplied with Enzyme:
 10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
 Incubate at 55°C.
Not blocked by overlapping *dam*-methylation (G^mATC): **GCGATCGC**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 250 mM NaCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
 No (65° C for 20 minutes)
 Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Rga I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of Ad2 DNA with 10 units of Rga I for 16 hours.
Star activity: High enzyme concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	10-25	25-50	100

Rig I (prototype Fse I) **GGCCGG[^]CC** **E529** **100 u.a.**
CC[^]GGCCGG **E530** **500 u.a.**
 Isolated from *Rhizobium yangligense*

Concentration: 1 000 - 5 000 units/ml
Assayed on Adenovirus-2 DNA
Reagents Supplied with Enzyme:
 10×SE Buffer RigI, BSA
Reaction conditions:
 1×SE Buffer RigI+BSA
 Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 100 mM KCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 200 µg/ml BSA,
 50% glycerol.
 Store at -20°C(*see note)
Diluent: SE Buffer A
Heat Inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Rig I, > 95% of Ad2 DNA fragments can be ligated with T4 DNA Ligase and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of Ad2 DNA with 6 units of Rig I for 16 hours.
Do not use BSA for long incubation.
***Note: For long term storage (more than 7 days), store at -70°C .**

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	0-10	10-25	50-75

Rsa I (prototype Rsa I)

Isolated from *Rhodospseudomonas sphaeroides*



GT[^]AC
CA[^]TG

E113
E114

1000 u.a.
5000 u.a.

Concentration: 10 000 – 30 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer B
Reaction conditions: 1× SE Buffer B
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 100 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with Rsa I,
> 90% of the DNA fragments can be
ligated and recut.
Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 40 units of Rsa I for
16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	0-10	50-75	75-100

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RsaN I (prototype Rsa I)

Isolated from *Rhodospseudomonas sphaeroides* N

G[^]TAC
CAT[^]G

E555
E556

200 u.a.
1000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer B
Reaction conditions: 1× SE Buffer B
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
250 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 100 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with RsaN I,
> 90% of λ DNA fragments can be
ligated with T4 DNA Ligase and recut.
Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 10 units of RsaN I
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	50-75	50-75	75-100

Rsr2 I (prototype Rsr II)

Isolated from *Rhodobacter sphaeroides* 12

CG[^]GWCCG
GCCWG[^]GC

E281
E282

1000 u.a.
5000 u.a.

Concentration: 10 000 - 30 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y, BSA
Reaction conditions: 1×SE Buffer Y+BSA
Incubate at 37°C.
*To obtain 100% activity, BSA should be
added to the 1× reaction mix to a final
concentration of 100 µg/ml.*

Storage buffer: 10 mM Tris-HCl (pH 7.5);
100 mM NaCl; 0.1 mM EDTA;
7 mM 2-mercaptoethanol; 100 µg/ml BSA,
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with Rsr2 I,
> 90% of the DNA fragments can be
ligated and recut.
Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 60 units of Rsr2 I
for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	0-10	10-25	100

Sal I (prototype Sal I)

Isolated from an *E.coli* strain that carries the
cloned Sal I gene from *Streptomyces albus*

G[^]TCGAC
CAGCT[^]G

E115
E116

2000 u.a.
10000 u.a.

Concentration: 10 000 units/ml
Assayed on λ DNA (Hind III-digest)
Reagents Supplied with Enzyme:
10×SE Buffer O
Reaction conditions: 1× SE Buffer O
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 µg/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
overdigestion with Sal I, 95% of the
DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of Sal I for
16 hours.
Star activity: High enzyme
concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	100	25-50	0-10

Sbf I (prototype Sse8387 I)

Isolated from *Streptomyces* species Bf61

CCTGCA[^]GG
GG[^]ACGTCC

E101
E102

200 u.a.
1000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10×SE Buffer Y
Reaction conditions: 1×SE Buffer Y
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.6);
50 mM NaCl; 0.1 mM EDTA;
1 mM DTT; 200 µg/ml BSA; 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
No (65° C for 20 minutes)
Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with Sbf I, > 90% of the
DNA fragments can be ligated. Of these,
90% can be recut.
Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 10 units of Sbf I for
16 hours.
Star activity: High enzyme
concentration may result in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	0-10	0-10	100

Set I (prototype Set I)

Isolated from an *E.coli* strain that carries the cloned Set I gene from *Streptomyces werraensis* 37

ASST[^] E537 200 u.a.
^TSSA E538 1000 u.a.

For high concentration
E538X 1000 u.a.

Set I is a restriction endonuclease with 4 expected recognition sites as well as relaxed non-cognate sites (star sites).

Concentration: 5 000 and 20 000 units/ml

One unit is defined as the amount of enzyme required to cleave 1 pmol of the double-stranded oligonucleotide with the following structure

5'-CGAGTTATAGCTGGGCCCAAC-3'

3'-GCTCAAATATCGACCCGGGTG-5'

in 1 hour at 50°C in a total reaction volume of 20 µl.

Reagents Supplied with Enzyme:

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 55°C.

Storage buffer: 10 mM Tris-HCl (pH 7.6); 100 mM NaCl; 0.1 mM EDTA; 1mM DTT, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat Inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with Set I, 50% of the pBR322 DNA fragments can be ligated with T4 DNA Ligase and recut.

Overdigestion assay: Set I overnight digestion greatly enhances the star activity. DNA can be digested to small oligos under "star" conditions.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	75-100	75-100	100

SfaN I (prototype SfaN I)

Isolated from an *E.coli* strain that carries the cloned SfaN I gene from *Streptococcus faecalis* N



GCATC(N)₅[^] E165 500 u.a.
CGTAG(N)₉[^] E166 2500 u.a.

Concentration: 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer O

Reaction conditions: 1× SE Buffer O

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 300 mM NaCl; 0,1 mM EDTA; 1 mM DTT; 200 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with SfaN I, > 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of SfaN I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	75-100	0-10

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Sfi I (prototype Sfi I)

Isolated from an *E.coli* strain that carries the cloned Sfi I gene from *Streptomyces fimbriatus*

GGCCNNNN[^]NGGCC E123 1000 u.a.
CCGGN[^]NNNNCCGG E124 5000 u.a.

For high concentration
E123X 1000 u.a.
E124X 5000 u.a.

Concentration: 10 000 and 40 000 units/ml
Assayed on T7 DNA

Reagents Supplied with Enzyme:

10×SE Buffer G, BSA

Reaction conditions: 1×SE Buffer G+BSA

Incubate at 50°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Blocked by overlapping *dcm*-methylation (C^mCWGG): **GGCCWGGNNGGCC.**

Not blocked by overlapping *dcm*-methylation

(C^mCWGG): **GGCCNNNNNGGCCWGG.**

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA, 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Sfi I, about 70% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of T7 DNA with 20 units of Sfi I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	100	25-50	25-50	25-50

Sfr274 I (prototype Xho I)

Isolated from *Streptomyces fradiae* 274

C[^]TCGAG E125 2000 u.a.
GAGCT[^]C E126 10000 u.a.

Concentration: 10 000 – 30 000 units/ml

Assayed on λ DNA (Hind III-digest)

Reagents Supplied with Enzyme:

10×SE Buffer B

Reaction conditions: 1×SE Buffer B

Incubate at 50°C.

Blocked by CTCG^mAG methylation.

Not blocked by CT^mCGAG methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Sfr274 I, 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Sfr274 I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	50-75	50-75	75-100



New product



Mammalian Genome Qualified



New package

Sfr303 I (prototype Sac II)Isolated from *Streptomyces fradiae* 303CCGC^GG
GG^CGCCE127
E1281000 u.a.
5000 u.a.

Concentration: 5 000 – 20 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10 \times SE Buffer B
Reaction conditions: 1 \times SE Buffer B
 Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 100 mM NaCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
 overdigestion with Sfr303 I,
 > 90% of the DNA fragments can be
 ligated and recut.
Overdigestion assay: No nonspecific
 activity was detected after incubation of
 1 μ g of λ DNA with 20 units of Sfr303 I
 for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	10-25	10-25	75-100

Sma I (prototype Sma I)Isolated from an *E.coli* strain that carries the
cloned Sma I gene from *Serratia marcescens*CCC^GGG
GGG^CCCE177
E1782000 u.a.
10000 u.a.

Concentration: 20 000 units/ml
Assayed on λ DNA (Hind III-digest)
Reagents Supplied with Enzyme:
 10 \times SE Buffer Y
Reaction conditions: 1 \times SE Buffer Y
 Incubate at 25°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 50 mM NaCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 200 μ g/ml BSA,
 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
 overdigestion with Sma I,
 > 90% of the DNA fragments can be
 ligated by high concentration T4 DNA
 Ligase and 10% PEG, and recut.
Overdigestion assay: No nonspecific
 activity was detected after incubation of
 1 μ g of λ DNA with 40 units of Sma I
 for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	0-10	0-10	0-10	100

Smi I (prototype Swa I)Isolated from *Streptococcus milleri* SATTT^AAAT
TAAA^TTTAE225
E2261000 u.a.
5000 u.a.

Concentration: 10 000 - 30 000 units/ml
Assayed on T7 DNA (Ssp I-digest)
Reagents Supplied with Enzyme:
 10 \times SE Buffer O, BSA
Reaction conditions: 1 \times SE Buffer O+BSA
 Incubate at 37°C.
*To obtain 100% activity, BSA should be
 added to the 1 \times reaction mix to a final
 concentration of 100 μ g/ml.*

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 250 mM NaCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 100 μ g/ml BSA;
 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
 overdigestion with Smi I, about 80% of
 the DNA fragments can be ligated and
 recut. In the presence of 10% PEG
 ligation is better.
Overdigestion assay: No nonspecific
 activity was detected after incubation of
 1 μ g of T7 DNA with 30 units of Smi I
 for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	100	75-100	25-50

SmiM I (prototype Msl I)Isolated from *Spingobacterium mizutae* MCAYNN^NNRTG
GTRNN^NNYACE293
E294500 u.a.
2500 u.a.

Concentration: 5 000 – 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10 \times SE Buffer W
Reaction conditions: 1 \times SE Buffer W
 Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 250 mM NaCl; 0.1 mM EDTA;
 7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
 and 50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat Inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
 overdigestion with SmiM I, 90% of the
 DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific
 activity was detected after incubation of
 1 μ g of DNA with 20 units of SmiM I
 for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	75-100	100	10-25

Sph I (prototype Sph I)Isolated from an *E.coli* strain that carries the
cloned SphI gene from *Streptomyces
phaeochromogenes*GCATG^C
C^GTACGE129
E130500 u.a.
2500 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
 10 \times SE Buffer G, BSA
Reaction conditions: 1 \times SE Buffer G+BSA
 Incubate at 37°C.
*To obtain 100% activity, BSA should be
 added to the 1 \times reaction mix to a final
 concentration of 100 μ g/ml.*

Storage buffer: 10 mM Tris-HCl (pH 7.5);
 100 mM NaCl; 0.1 mM EDTA; 1 mM DTT;
 100 μ g/ml BSA; 50% glycerol.
 Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
 Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
 overdigestion with Sph I, 90% of the
 DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific
 activity was detected after incubation of
 1 μ g of λ DNA with 10 units of Sph I for
 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	100	75-100	75-100	50-75

Sse9 I (prototype Tsp509 I)

Isolated from an *E.coli* strain that carries the cloned Sse9I gene from *Sporosarcina* species 9



**^AATT
TTAA^**

**E217
E218**

**500 u.a.
2500 u.a.**

Concentration: 5 000 units/ml

Assayed on pBR322 DNA

Reagents Supplied with Enzyme:

10×SE Buffer B, BSA

Reaction conditions: 1×SE Buffer B+BSA

Incubate at 55°C.

Incubation at 37°C results in 75% activity.

To obtain 100% activity, BSA should be

added to the 1× reaction mix to a final

concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0.1 mM EDTA; 1 mM DTT;
200 µg/ml BSA; 50% glycerol. Store at -20°
C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 5-fold
overdigestion with Sse9 I,
> 95% of the DNA fragments can be
ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 5 units of Sse9 I for
16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	75-100	50-75	50-75	75-100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Ssp I (prototype Ssp I)

Isolated from an *E.coli* strain that carries the cloned SspI gene from *Sphaerotilus* species

**AAT^ATT
TTA^TAA**

**E041
E042**

**500 u.a.
2500 u.a.**

Concentration: 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer K, BSA

Reaction conditions: 1×SE Buffer K+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be

added to the 1× reaction mix to a final

concentration of 100 µg/ml.

Blocked by A^mATATT methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
200 mM NaCl; 0,1 mM EDTA; 1 mM DTT;
200 µg/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold
overdigestion with SspI 90% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of Ssp I for
16 hours.

Star activity: High enzyme
concentration may result in star activity.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	25-50	50-75	75-100

Taq I (prototype Taq I)

Isolated from an *E.coli* strain that carries the cloned Taq I gene from *Thermus aquaticus*



**T^CGA
AGC^T**

**E133
E134**

**2000 u.a.
10000 u.a.**

Concentration: 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y, BSA

Reaction conditions: 1×SE Buffer Y+BSA

Incubate at 65°C.

To obtain 100% activity, BSA should be

added to the 1× reaction mix to a final

concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
300 mM NaCl; 0,1 mM EDTA; 1 mM DTT ;
200 µg/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with Taq I, > 95% of the
DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 20 units of Taq I for
16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	75-100	75-100	50-75	100

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Tru9 I (prototype Mse I)

Isolated from an *E.coli* strain that carries the cloned Tru9 I gene from *Thermus ruber* 9



**T^TAA
AAT^T**

**E199
E200**

**500 u.a.
2500 u.a.**

Concentration: 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer W

Reaction conditions: 1×SE Buffer W

Incubate at 65°C.

Blocked by TTA^mA methylation.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0,1 mM EDTA; 1 mM DTT;
200 µg/ml BSA; 50% glycerol.
Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 20-fold
overdigestion with Tru9 I,
> 95% of the DNA fragments can be
ligated and recut.

Overdigestion assay: No nonspecific
activity was detected after incubation of
1 µg of λ DNA with 40 units of Tru9 I
for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	25-50	25-50	100	50-75

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml



New product



Mammalian Genome Qualified



New package

Tth111 I (prototype Tth111 I)

Isolated from an *E.coli* strain that carries the cloned Tth111 I gene from *Thermus thermophilus* 111

GACN[^]NNGTC
CTGNN[^]NCAG

E097
E098

400 u.a.
2000 u.a.

Concentration: 5 000 units/ml
Assayed on λ DNA (HindIII-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer Y
Reaction conditions: 1 \times SE Buffer Y
Incubate at 65°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
500 mM NaCl; 0,1 mM EDTA; 1 mM DTT ;
50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
No (65° C for 20 minutes)

Ligation/recutting assay: After 2-fold overdigestion with Tth111 I, about 10% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 5 units of Tth111 I for 16 hours.
Star activity: Long incubation or conditions of high enzyme concentration may result in star activity. Star activity is observed at a greater than 5-fold overdigestion of 1 μ g substrate with Tth111 I for 1 hour.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	10-25	10-25	100

Vne I (prototype ApaL I)

Isolated from an *E.coli* strain that carries the cloned VneI gene from *Vibrio nereis* 18

G[^]TGCAC
CACGT[^]G

E137
E138

1000 u.a.
5000 u.a.

Concentration: 10 000 – 20 000 units/ml
Assayed on λ DNA
Reagents Supplied with Enzyme:
10 \times SE Buffer O
Reaction conditions: 1 \times SE Buffer O
Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM KCl; 0,1 mM EDTA;
7 mM 2-mercaptoethanol; 200 μ g/ml BSA;
50% glycerol. Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Vne I, 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Vne I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	100	25-50	25-50

Vsp I (prototype Vsp I)

Isolated from an *E.coli* strain that carries the cloned Vsp I gene from *Vibrio* species 343



AT[^]TAAT
TAAT[^]TA

E139
E140

1000 u.a.
5000 u.a.

Concentration: 10 000 units/ml
Assayed on λ DNA
Reagents Supplied with Buffer:
10 \times SE Buffer W
Reaction conditions: 1 \times SE Buffer W
Incubate at 37°C.
Blocked by ATTA^mAT methylation.

Storage buffer: 10 mM Tris HCl (pH 7.6);
50 mM NaCl; 0,1 mM EDTA; 1 mM DTT;
200 μ g/ml BSA; 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Vsp I, 70% of the DNA fragments can be ligated. Of these, 90% can be recut. In the presence of 10% PEG ligation is better.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of λ DNA with 20 units of Vsp I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	0-10	10-25	50-75	100	25-50

Qualified for mammalian genome studies: http://science.sibenzyme.com/article8_article_28_1.phtml

Xba I (prototype Xba I)

Isolated from an *E.coli* strain that carries the cloned Xba I gene from *Xanthomonas badrii*



T[^]CTAGA
AGATC[^]T

E141
E142

2000 u.a.
10000 u.a.

For high concentration

E141X 2000 u.a.
E142X 10000 u.a.

Concentration:
20 000 and 50 000 units/ml
Assayed on λ DNA (dam⁻/ Hind III-digest)
Reagents Supplied with Enzyme:
10 \times SE Buffer O, BSA
Reaction conditions: 1 \times SE Buffer O+BSA
Incubate at 37°C.
To obtain 100% activity, BSA should be added to the 1 \times reaction mix to a final concentration of 100 μ g/ml.
Blocked by overlapping dam-methylation (G^mATC): **TCTAGATC**.

Storage buffer: 10 mM Tris-HCl (pH 7.5);
50 mM NaCl; 0,1 mM EDTA; 1 mM DTT;-
200 μ g/ml BSA; 50% glycerol.
Store at -20°C.
Diluent: SE Buffer A
Heat inactivation:
Yes (65° C for 20 minutes)

Ligation/recutting assay: After 20-fold overdigestion with Xba I, > 90% of the DNA fragments can be ligated and recut.
Overdigestion assay: No nonspecific activity was detected after incubation of 1 μ g of DNA with 40 units of Xba I for 16 hours.
Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	100	50-75	75-100

Qualified for human genome studies: http://science.sibenzyme.com/article8_article_31_1.phtml

Xma I (prototype Xma I)

Isolated from an *E.coli* strain that carries the cloned *XmaI* gene from *Xanthomonas malvacearum*

C[^]CCGGG GGGCC[^]C

E233

300 u.a.

E234

1500 u.a.

Concentration: 3000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y

Reaction conditions: 1×SE Buffer Y

Incubate at 37°C.

Storage buffer: 20 mM Tris-HCl (pH 7.6); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 200 µg/ml BSA; 50% glycerol. Store at -20° C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 3-fold overdigestion with XmaI, 95% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 3 units of Xma I for 16 hours.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	50-75	0	0-10	100

Zra I (prototype Aat II)

Isolated from an *E.coli* strain that carries the cloned *Zra I* gene from *Zoogloea ramigera*11

GAC[^]GTC

E463

200 u.a.

CTG[^]CAG

E464

1000 u.a.

Concentration: 10 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer B

Reaction conditions: 1×SE Buffer B

Incubate at 37°C.

ZraI is a neoschizomer of AatII.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 200 µg/ml BSA; 50% glycerol. Store at -20° C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Zra I, about 90% of the DNA fragments can be ligated and recut. In the presence of 10% PEG ligation is better.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 10 units of Zra I for 16 hours.

Star activity: High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	25-50	25-50	75-100

Zrm I (prototype Sca I)

Isolated from *Zoogloea ramigera* SCA



AGT[^]ACT

E005

1000 u.a.

TCA[^]TGA

E006

5000 u.a.

Concentration: 10 000 – 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer Y, BSA

Reaction conditions: 1×SE Buffer Y+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Zrm I, 70% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Zrm I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	25-50	0-10	0-10	100

Zsp2 I (prototype Ava III)

Isolated from *Zoogloea* species 2

ATGCA[^]T

E145

1000 u.a.

T[^]ACGTA

E146

5000 u.a.

Concentration: 5 000 – 20 000 units/ml

Assayed on λ DNA

Reagents Supplied with Enzyme:

10×SE Buffer B, BSA

Reaction conditions: 1×SE Buffer B+BSA

Incubate at 37°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

Yes (65° C for 20 minutes)

Ligation/recutting assay: After 10-fold overdigestion with Zsp2 I, > 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of λ DNA with 20 units of Zsp2 I for 16 hours.

Do not use BSA for long incubation.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	100	50-75	25-50	25-50	25-50



New product



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New package

Nickases

Nicking Endonuclease N.Bst9 I

Isolated from *Bacillus stearothermophilus* T9

GAGTCNNNN^NN

CTCAGNNNNNN

E401

100 u.a.

E402

500 u.a.

Concentration: 2 000 – 5 000 units/ml

Assayed on T7 DNA

Reagents Supplied with Enzyme:

10×SE Buffer N.Bst9I

Reaction conditions: 1×SE Buffer N.Bst9 I

Incubate at 55°C.

Incubation at 37°C results in 20% activity.

Storage buffer: 10 mM Tris-HCl (pH 7.5);

50 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA;

50% glycerol. Store at -20°C.

Diluent: SE Buffer A

Heat inactivation:

No (65° C for 20 minutes)

Yes (80° C for 20 minutes)

Ligation/recutting assay: After 5-fold overdigestion with N.Bst9 I, 90% of the DNA fragments can be ligated and recut.

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of T7 DNA with 2 units of N.Bst9I for 16 hours.

Star activity: High enzyme concentration results in star activity.

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	75-100	100	100	50-75

Methyl-directed DNA endonucleases

Bis I (prototype Bis I)

Isolated from *Bacillus subtilis* T30

G(5mC)[^]NGC
CGN[^](5mC)G

E485
E486

40 u.a.
200 u.a.

The enzyme cleaves only C5-methylated DNA! [1]

Concentration: 1 000 – 2 000 units/ml

Assayed on Double-stranded oligonucleotide

5' GCTGTACTTTA G(5mC)G G C ATTGATTCTCACCACG 3'

3' CGAACATGAAAT C G C(5mC)G TAACTAAGAGTGGTGC 5'

One unit is defined as the amount of enzyme required to cleave 1 pmol of the double-stranded oligonucleotide with the following structure

5' GCTGTACTTTA G(5mC)G G CATTGATTCTCACCACG 3'

3' CGAACATGAAATC G C(5mC)G TAACTAAGAGTGGTGC 5'

in 1 hour at 37°C in a total reaction volume of 20 µl.

Reagents Supplied with Enzyme: 10×SE Buffer BisI

Reaction conditions: 1× SE Buffer BisI

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 100 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.**

Overdigestion assay: No nonspecific activity was detected after incubation of 1 µg of pFsp4HI1 DNA (BamHI digest) with 1 unit of BisI for 16 hours at 37°C. The pFsp4HI1 plasmid carries a gene for Fsp4HI DNA-methyltransferase, which modifies DNA forming 5'-G(5mC)NGC-3'/3'-CGN(5mC)G-5'.

1.Chmuzh E.V., Kashirina J.G., Tomilova J.E., Mezentseva N.V., Dedkov V.S., Gonchar D.A., Abdurashitov M.A., Degtyarev S.Kh. A Novel Restriction Endonuclease BisI from *Bacillus subtilis* T30, Recognizes a Methylated DNA Sequence 5'-G(m5C)[^]NGC-3'// Biotekhnologia (Moscow), No.3, p.22-26 (2005) (In Russian). Online version in English: http://science.sibenzyme.com/article8_article_7_1.phtml

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	25-50	50-75	75-100	50-75

Bls I (prototype Bls I)

Isolated from *Bacillus simplex* 23

G(5mC)N[^]GC
(5mC)G[^]N(5mC)G

E533
E534

100 u.a.
500 u.a.

The enzyme cleaves only methylated DNA! [1]

Concentration: 8000 units/ml

Assayed on DNA pFsp4HI3/DriI is a linearized plasmid pFsp4HI3, which includes a gene of DNA-methyltransferase M.Fsp4HI and contains three canonical sites:

5'-G(5mC)NG(5mC)-3'/3'-CGN(5mC)G-5'.

One unit is defined as the amount of enzyme required to hydrolyze at least one of three canonical sites

5'-G(5mC)NG(5mC)-3'/3'-CGN(5mC)G-5'

in 1 µg of linearized plasmid pFsp4HI3 in 1 hour at 30°C

in a total reaction volume of 50 µl.

Reagents Supplied with Enzyme: 10×SE Buffer W

Reaction conditions: 1× SE Buffer W

Incubate at 30°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol. **Store at -20°C.**

Overdigestion assay: No detectable degradation of 1µg of Lambda DNA was observed after incubation with 8 units of enzyme for 16 hours at 30°C in a total reaction volume of 50 µl.

1.Chernukhin V.A., Tomilova Yu.E., Chmuzh E.V., Sokolova O.O., Dedkov V.S., Degtyarev S.Kh. Site-specific endonuclease BlsI recognizes DNA sequence 5'-G(5mC)N[^]GC-3' and cleaves it producing 3' sticky ends// Bulletin of biotechnology and physico-chemical biology named by Yu.A.Ovchinnikov (Moscow), V.3, No.1, p.28-33 (2007) (In Russian).

Online version in English: http://science.sibenzyme.com/article8_article_25_1.phtml

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	10-25	10-25	50-75	100	75-100



New product



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New package

Gla I (prototype GlaI)

Isolated from Glacial ice bacterium GL 29

G(5mC)[^]G(5mC)
(5mC)G[^](5mC)G

E493 100 u.a.
E494 500 u.a.

The enzyme cleaves only C5-methylated DNA and does not cut unmodified DNA and DNA with 4-methylcytosines.[1]

Concentration: 8 000 units/ml

Assayed on DNA pHspAI2/GsaI is a linearized plasmid pHspAI2, which includes a gene of DNA-methyltransferase M.HspAI (recognition sequence 5'-GCGC-3') and contains a unique GlaI canonical site

5'-G(5mC)G(5mC)-3'/3'-(5mC)G(5mC)G-5'

One unit is defined as the amount of enzyme required to hydrolyze completely a unique 5'-G(5mC)G(5mC)-3'/3'-(5mC)G(5mC)G-5' site in 1 µg of pHspAI2 plasmid DNA, which is linearized with GsaI, in 1 hour at 30°C in a total reaction volume of 50 µl.

Reagents Supplied with Enzyme:

10×SE Buffer Gla I, pHspAI2/GsaI DNA.

pHspAI2/GsaI DNA is a linearized plasmid pHspAI2, which includes a gene of DNA-methyltransferase M.HspAI(recognition sequence 5'-GCGC-3') and contains a unique GlaI canonical site: 5'-G(5mC)G(5mC)-3'/3'-(5mC)G(5mC)G-5'.

Reaction conditions: 1× SE Buffer Gla I.

Incubate at 30°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 0,05% Triton X-100; 100 µg/ml BSA, 50% glycerol.

Store at -20°C.

Overdigestion assay: No detectable degradation of 1µg of Lambda DNA was observed after incubation with 8 units of enzyme for 16 hours at 30°C in a total reaction volume of 50 µl.

1.Chernukhin V.A., Najakshina T.N., Abdurashitov M.A., Tomilova J.E., Mezentzeva N.V., Dedkov V.S., Mikhnenkova N.A., Gonchar D.A., Degtyarev S. Kh A novel restriction endonuclease GlaI recognizes methylated sequence 5'-G(5mC)[^]GC-3'// Biotechnologia V.4. p.31-35(2006) (In Russian). Online version in English: http://science.sibenzyme.com/article8_article_11_1.phtml

2. Tomilova J.E., Chernukhin V.A., Degtyarev S.Kh. Dependence of site-specific endonuclease GlaI activity on quantity and location of methylcytosines in the recognition sequence 5'-GCGC-3'. // Bulletin of biotechnology and physico-chemical biology V.2, No 1, p.30-39 (2006) (In Russian).

Online version in English: http://science.sibenzyme.com/article10_article_22_1.phtml

3. Tarasova G. V., Nayakshina T. N., Degtyarev S. Kh. Substrate specificity of new methyl-directed DNA endonuclease GlaI . // BMC Molecular Biology 2008, 9:7.

4. Abdurashitov M.A., Chernukhin V.A, Gonchar D.A., Degtyarev S.Kh. GlaI digestion of mouse γ-satellite DNA: study of primary structure and ACGT sites methylation.// BMC Genomics 2009, 10:322.

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	75-100	75-100	75-100	75-100	100

The enzyme activity depending on number and position of methylated nucleotides in the recognition sequence:

recognition sequence	G(mC)G(mC) (mC)G(mC) G	R(mC)G(mC) Y G(mC) G	G (mC)R(mC) (mC) G Y G
Activity, %	100	> 25	> 6

Glu I (prototype GluI)

Isolated from Glacial ice bacterium GL 24

(5mC)G(5mC)[^]NG(5mC)G
G(5mC)GN[^](5mC)G(5mC)

E519 50 u.a.
E520 250 u.a.

The enzyme cleaves only C5-methylated DNA! [1]

Concentration: 1 000 units/ml

Assayed on DNA pFsp4HI3/DriI is a linearized plasmid pFsp4HI3, which includes a gene of DNA-methyltransferase M.Fsp4HI and contains a unique canonical site:

5'-G(5mC)NG(5mC)-3'/3'-(5mC)GN(5mC)G-5'.

One unit is defined as the amount of enzyme required to hydrolyze completely a unique canonical site:

5'-G(5mC)NG(5mC)-3'/3'-(5mC)GN(5mC)G-5'

in 1 µg of linearized plasmid pFsp4HI3/DriI in 1 hour at 50°C in a total reaction volume of 50 µl.

Reagents Supplied with Enzyme:

10×SE Buffer 2K

Reaction conditions: 1× SE Buffer 2K

Incubate at 50°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM KCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 200 µg/ml BSA; 50% glycerol.

Store at -20°C.

Overdigestion assay: No detectable degradation of 1µg of Lambda DNA was observed after incubation with 1 units of enzyme for 16 hours at 50°C in a total reaction volume of 50 µl.

1. Chernukhin V.A., Chmuzh E.V., Tomilova Yu.E., Nayakshina T.N., Gonchar D.A., Dedkov V.S., Degtyarev S.Kh. A novel site-specific endonuclease GluI recognizes methylated DNA sequence 5'-G(5mC)[^]NG(5mC)-3'/3'-(5mC)GN[^](5mC)G.// Bulletin of biotechnology and physico-chemical biology named by Yu.A.Ovchinnikov (Moscow), V.3, No.2, p.13-17 (2007) (In Russian). Online version in English: http://science.sibenzyme.com/article8_article_24_1.phtml

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	25-50	25-50	75-100	75-100	25-50

Kro I (prototype Kro I)

Isolated from *Kocurea rosea* 307



G[^]C(5mC)GGC
CGG(5mC)C[^]G

E541 50 u.a.
E542 250 u.a.

The enzyme cleaves C5-methylated DNA and doesn't cut unmodified DNA! [1]

Kro I doesn't cleave DNA modified with MspI DNA-methyltransferase

Concentration: 1 000 units/ml

Assayed on DNA pMHpaII1/DriI is a linearized plasmid pMHpaII1.

pMHpaII1 carries a gene of DNA-methyltransferase M.HpaII, which methylates sites

5'-CCGG-3' producing 5'-C(5mC)GG-3'/3'-GG(5mC)C-5',

and includes three canonical sites

5'-GC(5mC)GGC-3'/3'-CGG(5mC)CG-5'.

One unit One unit is defined as the amount of enzyme required to hydrolyze completely 1 µg of linearized plasmid pMHpaII1 in 1 hour at 37°C in a total reaction volume of 50 µl.

Reagents Supplied with Enzyme:

10×SE Buffer G

Reaction conditions: 1× SE Buffer G

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 200 µg /ml BSA; 50% glycerol.

Store at -20°C.

Overdigestion assay: No detectable degradation of 1µg of Lambda DNA was observed after incubation with 1 units of enzyme for 16 hours at 30°C in a total reaction volume of 50 µl.

1. Chernukhin V.A., Zhuravleva R.O., Tarasova G.V., Boltengagen A. A., Akishev A.G., Mikhnenkova N.A., Degtyarev S.Kh. Bacterial strain *Kocuria rosea* - producer of KroI site specific endonuclease. // Russian Federation patent RU 2394099 C1 (2010).

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	100	25-50	50-75	75-100

Pcs I (prototype Pcs I)

Isolated from *Paracoccus carotinifaciens* 3K



W(5mC)GNNNN[†]NNN(5mC)GW
WG(5mC)NNN[↓]NNNNG(5mC)W

E505 50 u.a.
E506 250 u.a.

The enzyme cleaves only C5-methylated DNA and does not cut unmodified DNA !

Concentration: 1 000 units/ml

Assayed on pMHgaI/DriI is a linearized plasmid pMHgaI, which included genes of DNA-methyltransferases M1.HgaI (recognition sequence 5'-GCGTC-3') and M2.HgaI (5'-GACGC-3') and contains a unique PcsI canonical site:

5'-W(5 m C)GNNNN[^]NNN(5 m C)GW-3'/3'-WG(5 m C)NNN[^]NNNNG(5mC)W-5'

One unit is defined as the amount of enzyme required to digest a unique site

5'-A(5mC)GNNNN[^]NNN(5mC)GT-3'

in 1 µg of DNA pMHgaI/DriI in 1 hour at 37°C in a total reaction volume of 50 µl.

pMHgaI/DriI is a linearized plasmid pMHgaI, which included

a genes of DNA-methyltransferases M1.HgaI (recognition sequence 5'-GCGTC-3')

and M2.HgaI (5'-GACGC-3') and contains a unique PcsI canonical site:

5'-W(5mC)GNNNN[^]NNN(5mC)GW-3'/3'-WG(5 m C)NNN[^]NNNNG(5mC)W-5'

Reagents Supplied with Enzyme:

10×SE Buffer Pcs I

Reaction conditions: 1 x SE-buffer PcsI, 10 % DMSO

Incubate at 37°C.

Storage buffer: 10 mM Tris-HCl (pH 7.5); 200 mM NaCl; 0.1 mM EDTA;

7 mM 2-mercaptoethanol; 0.1 mg/ml BSA, 50% glycerol.

Store at -20°C.

Overdigestion assay: No detectable degradation of 1µg of Lambda DNA was observed after incubation with 1 units of enzyme for 16 hours at 37°C in a total reaction volume of 50 µl.

Notes: When using a buffer other than the optimal (supplied) SEBuffer, it may be necessary to add more enzyme to achieve complete digestion.

Heat inactivation:

Yes (65° C for 20 minutes)

SE Buffers	B	G	O	W	Y
Activity in SE Buffers (% of max)	50-75	25-50	0	10-25	50-75



New product



Mammalian Genome Qualified

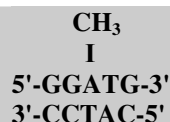


New package

DNA – Methyltransferases

M3.BstF5I

Isolated from *E.coli* strain, that carries the cloned M3.BstF5I gene from *Bacillus stearothermophilus* F5



M007

1000 u

Description: M3.BstF5I Methylase modifies the adenin residue (mA) in the recognition sequence 5'-GGATG-3'

Concentration: 10000 units/ml

Reagents Supplied: 10 × SEBuffer K, SAM

Incubate at 60°C.

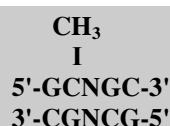
Storage Conditions: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit of the enzyme is the amount required to protect 1 µg of Lambda DNA in 1 hour at 60°C in a total reaction volume of 20 µl against cleavage by BstF5 I restriction endonuclease.

I. Golikova L.N., Netesova N.A., Gutorov V.V., Belavin P.A., Abdurashitov M.A., Gonchar D.A., Degtyarev S.Kh. Multiplicity of site-specific DNA-methyltransferases of the BstF5I restriction modification system from *Bacillus stearothermophilus* F5. // *Molecular Biology(Moscow)*, V.34, No.3, p.443-447 (2000) (In Russian).

M.Fsp4HI

Isolated from *E.coli* strain, that carries the cloned M.Fsp4HI gene from *Flavobacterium* species 4H



M001

100 u

Description: M.Fsp4HI Methylase modifies the internal cytosine residue (C5) in the recognition sequence 5'-GCNGC-3'.

Concentration: 500-1000 units/ml

Reagents Supplied: 10 × SEBuffer B, SAM

Incubate at 30°C.

Storage Conditions: 10 mM Tris-HCl (pH 7.6); 100 mM NaCl; 0.1 mM EDTA;

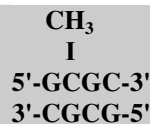
10 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit of the enzyme is the amount required to protect 1 µg of Lambda DNA in 1 hour at 30°C in a total reaction volume of 20 µl against cleavage by Fsp4HI restriction endonuclease.

I. Chmuzh E.V., Kashirina Yu.G., Tomilova Yu.E., Chernukhin V.A., Okhapkina S.S., Gonchar D. A., Dedkov V.S., Abdurashitov M. A., Degtyarev S. Kh. Gene cloning, comparative analysis of the protein structures from Fsp4HI restriction-modification system and biochemical characterization of the recombinant DNA methyltransferase M.Fsp4HI. // *Molecular Biology*, V.41, No 1, p.43-50 (2007) (In Russian).

M.HspAI

Isolated from *E.coli* strain, that carries the cloned M.HspAI gene from *Haemophilus* species AI



M003

100 u

Description: M.HspAI Methylase modifies the internal cytosine residue (C5) in the recognition sequence 5'-GCGC-3'.

Concentration: 1000-3000 units/ml

Reagents Supplied: 10 × SEBuffer B, SAM

Incubate at 37°C.

Storage Conditions: 10 mM Tris-HCl (pH 7.6); 100 mM NaCl; 0.1 mM EDTA;

10 mM 2-mercaptoethanol; 50% glycerol.. **Store at -20°C.**

Unit Definition: One unit of the enzyme is the amount required to protect 1 µg of Lambda DNA in 1 hour at 37°C in a total reaction volume of 20 µl against cleavage by HspAI restriction endonuclease.

I. Chernukhin V.A., Najakshina T.N., Abdurashitov M.A., Tomilova J.E., Mezentzeva N.V., Dedkov V.S., Mikhnenkova N.A., Gonchar D.A., Degtyarev S. Kh A novel restriction endonuclease GlAI recognizes methylated sequence 5'-G(5mC)^GC-3' // *Biotechnologia* V.4. p.31-35 (2006) (In Russian). Online version in English: http://science.sibenzyme.com/article8_article_11_1.phtml

R = A or G

W = A or T

S = G or C

K = G or T

M = A or C

Y = T or C

D = A or G or T

H = A or C or T

B = C or G or T

V = A or C or G

N = A or C or G or T



Polymerases

**DNA Polymerase I,
Large (Klenow) Fragment**

E325	200 u
E326	1000 u

Isolated from *E.coli* strain that carries the recombinant plasmid

Description: DNA Polymerase I, Large (Klenow) Fragment is a proteolytic product of *E. coli* DNA Polymerase I which retains polymerization and 3'→5' exonuclease activity, but has lost 5'→3' exonuclease activity.

Applications:

- dideoxy sequencing;
- polishing ends;
- second strand cDNA synthesis

Concentration: 5 000 units/ml**Reagents Supplied with Enzyme:** 10 × Klenow Buffer**Storage Conditions:** 10 mM KH₂PO₄ (pH 7.5); 50 mM KCl; 0.5 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol.**Store at -20°C.****Heat Inactivation:** 75°C for 20 minutes.**Unit Definition:** One unit is the amount of enzyme required to incorporate 10 nmol of dNTPs into an acid-insoluble material in 30 minutes at 37°C.**Unit Assay Conditions:** 1 × Klenow Buffer,33 μM dNTP including [³H]-dTTP and 70 μg/ml denatured calf thymus DNA.**Quality Control:** Purified free of contaminating endonucleases and exonucleases.**M-MuLV Reverse Transcriptase
RNase H -**

E317	5000 u
E318	25000 u

Isolated from *E.coli* strain that carries the recombinant plasmid

Description: Moloney Murine Leukemia Virus (M-MuLV) Reverse Transcriptase is an RNA directed DNA polymerase. This enzyme can synthesize a complementary DNA strand initiating from a primer using either RNA (cDNA synthesis) or single-stranded DNA as a template. The absence of RNase H activity enhances the synthesis of long cDNAs and therefore the enzyme is recommended for preparing long cDNAs.

Application: first strand cDNA synthesis.**Concentration:** 100 000–500 000 units/ml**Reagents Supplied with Enzyme:**

10 × M-MuLV Reverse Transcriptase Buffer

Storage Conditions: 10 mM KH₂PO₄ (pH 7.5); 0,1 mM EDTA; 200 mM NaCl; 7 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.****Unit Definition:** One unit is the amount of the enzyme required to incorporate 1 nmol of dTTP into an acid-insoluble material in 10 minutes at 37°C using poly(rA)•oligo(dT).**Unit Assay Conditions:** 50 mM Tris-HCl (pH 8.3), 6 mM MgCl₂, 10 mM DTT, 0.5 mM [³H]-dTTP, 0.4 mM poly(rA)•oligo(dT) 12-18.**Quality Control:** Purified free of detectable levels of RNase, endonuclease and exonuclease activities.**T4 DNA Polymerase**

E339	200 u.
E340	1000 u

Isolated from *E.coli* strain that carries the recombinant plasmid

Description: T4 DNA Polymerase catalyzes the synthesis of DNA in the 5'→3' direction and requires the presence of template and primer. This enzyme has a 3'→5' exonuclease activity.

Applications:

- polishing ends;
- probe labeling using replacement synthesis.

Concentration: 2 000 – 5 000 units/ml**Reagents Supplied with Enzyme:** 10 × T4 DNA Polymerase Buffer**Storage Conditions:** 20 mM Tris-HCl (pH 7.5); 50 mM KCl;10 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.****Heat Inactivation:** 75°C for 10 minutes.**Unit Definition:** One unit is the amount of enzyme required to incorporate 10 nmol of dNTP into acid-precipitable material in 30 minutes at 37°C.**Unit Assay Conditions:** 1 × T4 DNA Polymerase Reaction Buffer, 33 μM dNTPs including [³H]-dTTP and 70 μg/ml denatured calf thymus DNA.**Quality Control:** Purified free of contaminating endonucleases and exonucleases.

Taq DNA Polymerase with Standard Taq Buffer

E331 200 u
E332 1000 u

Isolated from *E.coli* strain that carries the recombinant plasmid

Description: Taq DNA polymerase is a thermostable DNA polymerase that possesses a 5'→3' polymerase activity and a double strand specific 5'→3' exonuclease activity.

Applications:

- nick translation;
- primer extension reaction.

Concentration: 5 000 units/ml

Reagents Supplied with Enzyme: 10 × Taq-DNA-polymerase buffer.

Storage conditions: 20 mM Tris-HCl (pH 7.6); 100 mM KCl;

0.1 mM EDTA; 1 mM DTT; 0.5 % Triton X-100; 50% glycerol.

Store at -20°C.

Unit Definition: One unit is the amount of enzyme required to incorporate 10 nmol of dNTP into acid-insoluble material in 30 minutes at 72°C.

Unit Assay Conditions: 1 × Taq-DNA-polymerase buffer, 200 μM dNTPs including [³H]-dTTP and 250 μg/ml activated calf thymus DNA.

Quality Control: Purified free of contaminating endonucleases and exonucleases.

Taq DNA Polymerase with AS Buffer



E337 200 u
E338 1000 u

Isolated from *E.coli* strain that carries the recombinant plasmid

Description: Taq DNA polymerase is a thermostable DNA polymerase that possesses a 5'→3' polymerase activity and a double strand specific 5'→3' exonuclease activity.

Applications:

- nick translation;
- primer extension reaction.

Concentration: 5 000 units/ml

Reagents Supplied with Enzyme:

10 × AS (Ammonium Sulfate) buffer.

Storage conditions: 20 mM Tris-HCl (pH 7.6); 100 mM KCl;

0.1 mM EDTA; 1 mM DTT; 0.5 % Triton X-100; 50% glycerol.

Store at -20°C.

Unit Definition: One unit is the amount of enzyme required to incorporate 10 nmol of dNTP into acid-insoluble material in 30 minutes at 72°C.

Unit Assay Conditions: 1 × AS (Ammonium Sulfate) buffer, 200 μM dNTPs including [³H]-dTTP and 250 μg/ml activated calf thymus DNA.

Quality Control: Purified free of contaminating endonucleases and exonucleases.

TaqSE DNA Polymerase

E313 200 u
E314 1000 u

Isolated from *E.coli* strain that carries the recombinant plasmids.

Description: TaqSE DNA polymerase is a complex mix of thermostable DNA polymerase that possesses a 5'→3' polymerase activity, 3'→5' exonuclease (proofreading) activity and a double strand specific 5'→3' exonuclease activity.

It may increase yield of reaction product compare to Taq DNA polymerase.

Application: long high fidelity primer extension reaction.

Concentration: 5 000 units/ml

Reagents Supplied with Enzyme: 10 × Taq-DNA-polymerase buffer.

Storage conditions: 20 mM Tris-HCl (pH 7.6); 100 mM KCl;

0.1 mM EDTA; 1 mM DTT; 0.5 % Triton X-100; 50% glycerol.

Store at -20°C.

Unit Definition: One unit is the amount of enzyme required to incorporate 10 nmol of dNTP into acid-insoluble material in 30 minutes at 72°C.

Unit Assay Conditions: 1 × Taq-DNA-polymerase buffer, 200 μM dNTPs including [³H]-dTTP and 250 μg/ml activated calf thymus DNA.

Quality Control: Purified free of contaminating endonucleases and exonucleases.

Hot Start Taq-DNA Polymerase

E351 200 u
E352 1000 u

Description: Hot Start Taq DNA Polymerase is complex mixture of a thermostable 94 kD Taq DNA Polymerase purified from *E.coli* recombinant strain expressing *Thermus aquaticus* polymerase gene and specific monoclonal antibodies.

Hot Start Taq DNA Polymerase is inactive under conditions of amplification reaction preparation. It can eliminate amplification artefacts such as primer-dimer formation and mispriming during preamplification stage and thus may provide improved specificity when compared to standard DNA polymerases.

An advantage of Hot Start Taq DNA Polymerase is the absence of additional heating step for polymerase activation. Heat activation of enzyme occurs during the first denaturation step. An inactive complex of Hot Start Taq DNA Polymerase dissociates automatically over +70°C, allowing activation of DNA polymerase.

Applications: -Highly specific PCR;

- Multiplex PCR (highly recommended);
- High sensitivity applications.

Concentration: 5 000 units/ml

Reagents Supplied with Enzyme:

10 × Hot Start Taq-DNA-polymerase buffer.

Supplementary material is 50 mM MgCl₂.

Storage and dilution buffer: 20 mM Tris-HCl, pH 8.0, 100 mM KCl, 0.1 mM EDTA, 1 mM DTT, 50 % glycerol, 0.5 % Nonidet P-40, 0.5 % Tween-20. **Store at -20°C.**

Unit Definition: One unit of activity is the amount of enzyme required to incorporate 10 nmoles of dNTP into acid-insoluble material in 30 minutes at 74 °C.

Notes: The recommended amount of enzyme is 1 u per 50μl of a total reaction volume.

Pfu DNA Polymerase

Isolated from *E.coli* strain that carries the cloned DNA Polymerase gene from *Pyrococcus furiosus*.

E353 200 u
E354 1000 u

Description: Pfu DNA Polymerase catalyzes the DNA-dependent polymerization of nucleotides into duplex DNA in the 5'→3' direction in the presence of magnesium ions. The enzyme also exhibits 3'→5' exonuclease (proofreading) activity, that enables the polymerase to correct nucleotide incorporation errors. Products of reaction have blunt ends.

Application: Pfu DNA Polymerase useful for high fidelity synthesis and polishing ends.

Concentration: 5 000 units/ml

Reagents Supplied with Enzyme:

10 × Pfu DNA polymerase buffer, 50 × BSA (5 mg/ml BSA).

Storage conditions: 10 mM K₂HPO₄ (pH 7.4); 0,1 mM DTT, 0,1 mM EDTA; 0,5 % Tween 20; 50% glycerol.

Store at -20°C.

To obtain 100% activity, BSA should be added to the 1× reaction mix to a final concentration of 100 µg/ml.

Unit Definition: One unit of enzyme catalyzes the incorporation of 10 nanomoles of deoxyribonucleotides into a polynucleotide fraction (adsorbed on DE- 81) in 30 minutes at 72°C.

Unit Assay Conditions: 1 × Pfu DNA polymerase buffer, 0.1 mg/ml BSA, 200µg/ml activated calf thymus DNA, 0.2 mM of each dNTP, 0.4MBq/ ml [³H]- dTTP in 50 µl reaction mix.

Quality Control: Purified free of contaminating endonucleases and exonucleases.

Notes: 1. Do **not** use dU-contained templates.

2. This enzyme is **not** recommended for a number of experiments dealing with very low-annealing temperature amplification approaches (e.g. RAPDs, Random Amplified Polymorphic DNAs).

3. Prepare PCR mix at 0°C.

Set in amplificator preheated to 95°C.

4. The recommended amount of enzyme is 2.5 u per 50µl of a total reaction volume.

T7 RNA Polymerase

Isolated from *E.coli* strain that carries the cloned T7 gene I

E355 5000 u
E356 25000 u

Description: T7 RNA Polymerase catalyzes the synthesis of RNA in the 5'→ 3' direction in the presence of a DNA template containing a T7 phage promoter.

Application: -Radiolabeled RNA probe preparation
-RNA generation for *in vitro* translation
-RNA generation for studies of RNA structure, processing and catalysis

Concentration: 100 000 units/ml

Reagents Supplied with Enzyme: 10 × T7 RNA polymerase buffer



Storage conditions: 50 mM Tris-HCl (pH 7.5); 100 mM NaCl; 20 mM 2-mercaptoethanol; 1 mM EDTA; 50% Glycerol; 0.1% Triton X-100.

Store at -20°C.

Unit Definition: One unit is the amount of enzyme required to incorporate 1 nmol NTP into an acid-insoluble material in 60 minutes at 37°C.

Quality Control: Purified free of contaminating endonucleases and exonucleases.

DNA Modifying Enzymes

<h3>Alkaline Phosphatase, Calf Intestinal</h3>		E327	100 u	
Alkaline Phosphatase mucosa		E328	500 u	
<p>Description: : Alkaline phosphatase catalyzes the removal of 5' phosphate groups from DNA, RNA and ribo- and deoxyribonucleoside triphosphates.</p> <p>Applications:</p> <ul style="list-style-type: none"> - removing 5' and 3' phosphoryl groups from nucleic acids; - preparing templates for 5' end labeling; - preventing fragments from self ligating; - dephosphorylation of proteins <p>Concentration: 10 000 units/ml.</p> <p>Reagents Supplied with Enzyme: 10 × SEBuffer O</p>	<p>Storage conditions: 10 mM Tris-HCl (pH 8.2); 50 mM KCl; 1 mM MgCl₂, 0,1 mM ZnCl₂, 50% glycerol.</p> <p>Store at -20°C.</p> <p>Unit Definition: One unit is the amount of enzyme that hydrolyzes 1 μmol of p-nitrophenylphosphate to p-nitrophenol in a total reaction volume of 1 ml in 1 min at 37°C.</p> <p>Unit Assay Conditions: 1 M diethanolamine-HCl(pH 9.8), 0.5 mM MgCl₂ and 10 mM p-nitrophenylphosphate. These conditions are only used for quantitating enzyme activity.</p> <p>Quality Control: Purified free of contaminating exonuclease, endonuclease, ribonuclease activities.</p>			
<h3>Thermolabile Alkaline Phosphatase</h3>			E365	200 u
Isolated from <i>E.coli</i> strain that carries the cloned <i>Alkaline Phosphatase</i> gene from <i>Alteromonas undina</i> P2			E366	1000 u
<p>Description: : Thermolabile Alkaline phosphatase catalyzes the removal of 5' phosphate groups from DNA, RNA and ribo- and deoxyribonucleoside triphosphates.</p> <p>Concentration: 5 000 units/ml.</p> <p>Reagents Supplied with Enzyme: 10 × SEBuffer W</p> <p>Heat inactivation: Yes (65° C for 20 minutes)</p>	<p>Storage conditions: 20 mM Tris-HCl (pH 7.6); 0,1 mM ZnCl₂, 50% glycerol.</p> <p>Store at -20°C.</p> <p>Unit Definition: One unit is the amount of enzyme that will dephosphorylate 1 μg of pUC19 DNA (linearized with Hind III) in 30 minutes at 25°C.</p> <p>Dephosphorylation is defined as >95% inhibition of recirculation in a self-ligation reaction that is measured by transformation into <i>E.coli</i>.</p> <p>Quality Control: Purified free of contaminating exonuclease, endonuclease, ribonuclease activities.</p>			
<h3>Endonuclease I</h3>		E323	4000 u	
Isolated from <i>Proteus vulgaris</i> 84		E324	20000 u	
<p>Description: Endonuclease I hydrolyzes double- and single-stranded nucleic acids to oligonucleotides of 3-5 nucleotide in length with 5'-terminal phosphates.</p> <p>Application: DNA and RNA degradation.</p> <p>Concentration: 10 000 – 50 000 units/ml.</p> <p>Reagents Supplied with Enzyme: 10 × Endonuclease I Buffer.</p>	<p>Storage Conditions: 10 mM Tris-HCl (pH 7.4); 250 mM NaCl; 0,2 mM EDTA; 7 mM 2-mercaptoethanol; 100 μg/ml BSA; 50% glycerol.</p> <p>Store at -20°C.</p> <p>Unit Definition: One unit is the amount of enzyme that hydrolyze 1 μg of Lambda DNA in 30 minutes at 37°C.</p> <p>Unit Assay Conditions: 20 mM Glycine-NaOH (pH 9.5), 100 mM NaCl, 25 mM MgCl₂; 1 mM 2-mercaptoethanol.</p> <p>Quality Control: Purified free of contaminating phosphatase activity.</p>			
<h3>Exonuclease III (<i>E. coli</i>)</h3>			E345	5000 u
Isolated from a recombinant source			E346	25000 u
<p>Description: Exonuclease III (<i>E. coli</i>) catalyzes the stepwise removal of mononucleotides from 3'-hydroxyl termini of double stranded DNA. Exonuclease III activity depends partially on helical structure and displays sequence dependence (C>A=T>G). Temperature, salt concentration and the ratio of enzyme to DNA greatly affect enzyme activity, requiring reaction conditions to be tailored to specific applications.</p> <p>Applications:</p> <ul style="list-style-type: none"> - unidirectional nested deletions; - site-directed mutagenesis; - preparation of strand-specific probes; - preparation of single-stranded substrates for dideoxy sequencing. <p>Concentration: 40 000 – 100 000 units/ml.</p> <p>Reagents Supplied with Enzyme: 10 × Exonuclease III Buffer .</p>	<p>Storage Conditions: 10 mM Tris-HCl (pH 7.5); 50 mM KCl; 0.5 mM EDTA; 1 mM 2-mercaptoethanol; 50% glycerol. Store at -20°C.</p> <p>Unit Definition: One unit is the amount of enzyme required to produce 1 nmol of acid soluble total nucleotide in 30 minutes at 37°C.</p> <p>Unit Assay Conditions: 50 mM Tris-HCl(pH 7.5 at 25°C); 1 mM MgCl₂; 1 mM DTT, 0.15 mM sonicated pancreatic DNA.</p>			

RNA Ligase T4

Isolated from *E.coli* strain that carries the cloned *RNA Ligase* gene from bacteriophage T4

Description: RNA Ligase catalyzes ligation of a 5' phosphoryl-terminated nucleic acid donor to a 3' hydroxyl-terminated nucleic acid acceptor through the formation of a 3'→5' phosphodiester bond, with hydrolysis of ATP to AMP and P_i. Substrates include single-stranded RNA and DNA as well as dinucleoside pyrophosphates.

Applications:

- labeling of 3'-termini of RNA with 5'-[³²P] pCp;
- inter- and intra-molecular joining of RNA and DNA molecules.

Concentration: 10 000 units/ml.

Reagents Supplied with Enzyme: 10 × T4 RNA Ligase Buffer.

E349 1000 u

E350 5000 u

Storage conditions: 10 mM Tris-HCl (pH 7.4); 50 mM KCl; 0.1 mM EDTA; 1 mM DTT; 50% glycerol.

Store at -20°C.

Unit Definition: One unit is defined as the amount of enzyme required to convert of 1 pmol of [³H]ATP in AMP-Ligase complex in 15 minutes at 25°C.

Unit Assay Conditions: 50 mM Tris-HCl (pH 7.8), 10 mM MgCl₂, 10 mM DTT, 0.2 μM [³H]ATP.

Quality Control: Free of contaminating single-stranded DNA exonuclease, endonuclease, ribonuclease and phosphatase activities.

T4 Polynucleotide Kinase

Isolated from *E.coli* strain that carries the cloned *Polynucleotide Kinase* gene from bacteriophage T4

Description: T4 polynucleotide Kinase catalyzes the transfer and exchange of P_i from the γ position of ATP to the 5' hydroxyl terminus of polynucleotides (double- and single-stranded DNA and RNA) and nucleoside 3'-monophosphates. The enzyme also catalyzes the removal of 3'- phosphoryl groups from 3'- phosphoryl polynucleotides, deoxynucleoside 3'- monophosphates and deoxynucleoside 3'-diphosphates.

Applications:

- end-labeling DNA or RNA for probes and DNA sequencing;
- addition of 5'- phosphates to oligonucleotides to allow subsequent ligation;
- removal of 3'- phosphoryl groups.

Concentration: 10 000 units/ml.

Reagents Supplied with Enzyme:

10 × T4 Polynucleotide Kinase Buffer.

E311 500 u

E312 2500 u

Storage conditions: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 1 mM DTT; 50% glycerol.

Store at -20°C.

Unit Definition One unit is the amount of enzyme catalyzing the incorporation of 1 nmol of acid-insoluble [³²P] in 30 minutes at 37°C.

Unit Assay Conditions: 1 × T4 Polynucleotide Kinase Buffer, 66 μM [γ-³²P] ATP (5 × 10⁶ cpm/μmol) and 0.26 mM 5'- hydroxyl-terminated salmon sperm DNA.

Quality Control: Free of exonuclease, phosphatase, endonuclease and RNase activities.

T4 DNA Ligase

Isolated from *E.coli* strain that carries the cloned *DNA Ligase* gene from bacteriophage T4

Description: T4 DNA Ligase catalyzes the formation of a phosphodiester bond between juxtaposed 5' phosphate and 3' hydroxyl termini in duplex DNA or RNA. This enzyme will join blunt-end and cohesive end termini as well as repair single stranded nicks in duplex DNA, RNA, or DNA/RNA hybrids.

Concentration: 50 000 - 200 000 units/ml

Applications:

- cloning of restriction fragments;
- joining linkers and adapters to blunt-ended DNA;

Reagents Supplied with Enzyme: 10 × T4 DNA Ligase Buffer.



E319 10000 u

E320 50000 u

Storage conditions: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit is defined as the amount of enzyme required to give 50% ligation of Hind III fragments of Lambda DNA (5' DNA termini concentration of 0.12 μM [300 μg/ml]) in 20 μl of 1 × T4 DNA Ligase Reaction Buffer in 30 minutes **at 16°C.**

Quality Control: Free of contaminating exonuclease and endonuclease.

Notes on Use: ATP is an essential cofactor for the reaction.

T4 DNA Ligase Concentrated

Isolated from *E.coli* strain that carries the cloned *DNA Ligase* gene from bacteriophage T4

Description: T4 DNA Ligase catalyzes the formation of a phosphodiester bond between juxtaposed 5' phosphate and 3' hydroxyl termini in duplex DNA or RNA. This enzyme will join blunt-end and cohesive end termini as well as repair single stranded nicks in duplex DNA, RNA, or DNA/RNA hybrids.

Concentration: 2 000 000 units/ml.

Applications:

- cloning of restriction fragments;
- joining linkers and adapters to blunt-ended DNA.

Reagents Supplied with Enzyme: 10 × T4 DNA Ligase Buffer.



E329 40000 u

E330 200000 u

Storage conditions: 10 mM Tris-HCl (pH 7.5); 50 mM NaCl; 0.1 mM EDTA; 7 mM 2-mercaptoethanol; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit is defined as the amount of enzyme required to give 50% ligation of Hind III fragments of Lambda DNA (5' DNA termini concentration of 0.12 μM [300 μg/ml]) in 20 μl of 1 × T4 DNA Ligase Reaction Buffer in 30 minutes **at 16°C.**

Quality Control: Free of contaminating exonuclease and endonuclease.

Notes on Use: ATP is an essential cofactor for the reaction.

Tli-Inorganic Pyrophosphatase

Isolated from *E.coli* strain that carries the cloned Inorganic pyrophosphatase gene from *Thermococcus litoralis*.

E315 100 u
E316 500 u

Description: Tli-Inorganic Pyrophosphatase catalyzes the hydrolysis of inorganic pyrophosphate to form orthophosphate:
 $P_2O_7^{4-} + H_2O \rightarrow 2HPO_4^{2-}$. Enzyme is extremely thermostable.

Concentration: 1 000 units/ml.

Reagents Supplied with Enzyme:

10 × Inorganic Pyrophosphatase Buffer.

Storage Conditions: 20 mM Tris-HCl (pH 7.6); 100 mM KCl; 0.1 mM EDTA; 0.2% Tween-20; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit is the amount of enzyme that will generate 40 nmoles of phosphate per minute from pyrophosphate under standard reaction conditions (a 10 minute reaction at 75°C in 50 mM Tris-HCl (pH 8.5), 1 mM MgCl₂, 0.32 mM PPi, reaction volume of 0.5 ml).

Quality Control: Free of exonuclease and endonuclease activities.

Uracil-DNA Glycosylase (UDG)

Isolated from a recombinant source



E335 1000 u
E336 5000 u

Description: *E.coli* uracil-DNA glycosylase (UDG) catalyzes the release of free uracil from uracil-containing DNA. UDG efficiently hydrolyzes uracil from single-stranded or double-stranded DNA, but not from oligomers (6 or fewer bases).

Applications:

- site-directed mutagenesis;
- as a probe for protein-DNA interaction studies.

Treatment of 1 µg of uracil-containing DNA with 1 unit of UDG for 10 minutes at 37°C renders the DNA incapable of being copied by DNA polymerase. The enzyme can be 95% heat killed by incubation at 95°C for 10 minutes.

Concentration: 20 000 – 50 000 units/ml.

Reagents Supplied with Enzyme: 10 × UDG Buffer .

Storage Conditions: 10 mM Tris-HCl (pH 7.6); 50 mM NaCl; 1 mM EDTA; 1 mM DTT; 50% glycerol. **Store at -20°C.**

Unit Definition: One unit is defined as the amount of enzyme that catalyzes the release of 60 pmol of uracil per minute from double-stranded, uracil-containing DNA. Activity is measured by release of [³H]-uracil in a 50 µl reaction containing 0.2 µg DNA (10⁴ – 10⁵ cpm/µg) in 30 minutes at 37°C.

Notes on Use: UDG is active over a broad pH range with an optimum at pH 8.0, does not require divalent cation, and is inhibited by high ionic strength (>200 mM).



DNA Ladders

1 Kb DNA Ladder

M11 50 mkg
M12 250 mkg

Description: The 1 Kb DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 13 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
10 000	60 ng	3000	200 ng	750	60 ng
8000	60 ng	2500	70 ng	500	30 ng
6000	60 ng	2000	60 ng	250	20 ng
5000	60 ng	1500	50 ng		
4000	60 ng	1000	210 ng		

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 1 Kb DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

50 Kb DNA Ladder

M29 50 mkg
M30 250 mkg

Description: The 50 Kb DNA Ladder has a number of proprietary plasmids and phages DNA which are digested to completion with appropriate restriction enzymes to yield 17 bands suitable for use as molecular weight standards for agarose pulsed-field gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
48502	70	6000	45	1500	35
39936	70	5000	45	1000	150
24730	70	4000	45	750	45
15206	70	3000	140	500	20
10000	45	2500	50	250	10
8000	45	2000	45		

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 50 Kb DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 0,5-1 mkg of the DNA Ladder per line.

100 bp DNA Ladder

M15 50 mkg
M16 250 mkg

Description: The 100 bp DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 10 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
1 000	190 ng	600	110 ng	200	40 ng
900	170 ng	500	130 ng	100	40 ng
800	150 ng	400	80 ng		
700	90 ng	300	40 ng		

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 100 bp DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

100 bp + 50 bp DNA Ladder



M33 50 mkg
M34 250 mkg

Description: The 100 bp + 50bp DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 11 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
1 000	160 ng	600	100 ng	200	30 ng
900	140 ng	500	170 ng	100	30 ng
800	120 ng	400	70 ng	50	20 ng
700	110 ng	300	50 ng		

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 100 bp + 50 bp DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

100 bp + 1.5 Kb DNA Ladder

M23 50 mkg
M24 250 mkg

Description: The 100 bp + 1.5 Kb DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 11 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
1500	150 ng	700	70 ng	300	30 ng
1000	200 ng	600	80 ng	200	20 ng
900	120 ng	500	150 ng	100	20 ng
800	110 ng	400	50 ng		

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 100 bp + 1.5 Kb DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

100 bp + 1.5 Kb + 3 Kb DNA Ladder

M27 50 mkg
M28 250 mkg

Description: The 100 bp + 1.5 Kb + 3 Kb DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 12 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
3000	70 ng	800	120 ng	400	60 ng
1500	60 ng	700	80 ng	300	40 ng
1000	140 ng	600	90 ng	200	30 ng
900	130 ng	500	120 ng	100	30 ng

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 100 bp + 1.5 Kb + 3 Kb DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

100 bp + 2 Kb + 3 Kb DNA Ladder

M25 50 mkg
M26 250 mkg

Description: The 100 bp + 2 Kb + 3 Kb DNA Ladder has a number of proprietary plasmids which are digested to completion with appropriate restriction enzymes to yield 12 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Base Pairs	DNA Mass	Base Pairs	DNA Mass	Base Pairs	DNA Mass
3000	120 ng	800	110 ng	400	50 ng
2000	120 ng	700	70 ng	300	30 ng
1000	160 ng	600	80 ng	200	20 ng
900	120 ng	500	100 ng	100	20 ng

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: The 100 bp + 2 Kb + 3 Kb DNA Ladder was not designed for precise quantification of DNA mass, but can be used for approximating the mass of DNA in comparably intense samples of similar size.

We recommend loading 1 mkg of the DNA Ladder per line.

Lambda DNA - Hind III Digest

M01 100 mkg
M02 500 mkg

Description: The Hind III digest of lambda DNA yields 8 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)			
23130	6557	2322	564
9416	4361	2027	125

Concentration: 500 mkg/ml

Storage buffer (TE): 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA. **Store at -20°C.**

Usage recommendation: Dilute in TE buffer (10 – 20 times) before loading.

We recommend loading 1 mkg of the DNA Ladder per line.

Lambda DNA - BssT1 I (Sty I) Digest

M05 100 mkg
M06 500 mkg

Description: The BssT1 I (Sty I) digest of lambda DNA yields 11 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)			
19329	4254	1882	421
7743	3472	1489	74
6223	2690	925	

Concentration: 500 mkg/ml

Storage buffer (TE): 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA. **Store at -20°C.**

Usage recommendation: Dilute in TE buffer (10 – 20 times) before loading.

We recommend loading 1 mkg of the DNA Ladder per line.

Lambda DNA - Bme18 I (Ava II) Digest

M03 100 mkg
M04 500 mkg

Description: The Bme18 I (Ava II) digest of lambda DNA yields 36 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)					
8126	2134	985	511	272	67
6555	2005	974	433	242	45
6442	1951	894	398	215	42
3676	1612	597	345	151	32
2605	1420	590	310	88	28
2555	1284	513	308	73	23

Concentration: 500 mkg/ml

Storage buffer (TE): 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA. **Store at -20°C.**

Usage recommendation: Dilute in TE buffer (10 – 20 times) before loading.

We recommend loading 1 mkg of the DNA Ladder per line.

Lambda DNA - Bgl I Digest

M17 100 mkg
M18 500 mkg

Description: The Bgl I digest of lambda DNA yields 30 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)					
16179	1650	1138	562	366	126
9649	1446	790	499	267	115
3009	1441	773	489	210	91
2481	1249	669	447	186	51
2256	1203	621	404	126	9

Concentration: 500 mkg/ml

Storage buffer (TE): 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA. **Store at -20°C.**

Usage recommendation: Dilute in TE buffer (10 – 20 times) before loading.

We recommend loading 1 mkg of the DNA Ladder per line.

Lambda DNA – BstE II Digest

M09 100 mkg
M10 500 mkg

Description: The BstEII digest of lambda DNA yields 14 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)					
8454	5686	3675	1371	224	
7242	4822	2323	1264	117	
6369	4324	1929	702		

Concentration: 500 mkg/ml

Storage buffer (TE): 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA. **Store at -20°C.**

Usage recommendation: Dilute in TE buffer (10 – 20 times) before loading.

We recommend loading 1 mkg of the DNA Ladder per line.

pBR322 DNA - BsuR I (HaeIII) Digest

M21 50 mkg
M22 250 mkg

Description: The BsuR I digest of pBR322 DNA yields 22 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)					
587	434	192	104	57	11
540	267	184	89	51	8
502	234	124	80	21	
458	213	123	64	18	

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: We recommend loading 1 mkg of the DNA Ladder per line.

pBR322 DNA - Alu I Digest

M19 50 mkg
M20 250 mkg

Description: The Alu I digest of pBR322 DNA yields 9 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)		
908	521	257
659	403	226
656	281	100

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: We recommend loading 1 mkg of the DNA Ladder per line.

pUC19 DNA - Kzo9 I (Sau3AI) Digest

M13 50 mkg
M14 250 mkg

Description: The Kzo9 I digest of pUC19 DNA yields 15 fragments suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)			
955	141	46	12
585	105	36	11
341	78	18	8
258	75	17	

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: We recommend loading 1 mkg of the DNA Ladder per line.

pUC19 DNA - Msp I Digest

M07 50 mkg
M08 250 mkg

Description: The Msp I digest of pUC19 DNA yields 12 bands suitable for use as molecular weight standards for agarose gel electrophoresis.

Length of the DNA fragments (Base Pairs)			
501	331	147	67
489	242	111	34
404	190	110	26

Concentration: 200 mkg/ml

Storage buffer: 10 mM Tris-HCl (pH 8.0), 1.0 mM EDTA, 50 mM NaCl. **Store at -20°C.**

Usage recommendation: We recommend loading 1 mkg of the DNA Ladder per line.



Plasmid and Phage DNAs

Lambda DNA (dam⁻, dcm⁻)

Isolated from bacteriophage lambda (c1857ind 1 Sam 7) obtained from heat inducible lysogen *E.coli* strain (dam⁻, dcm⁻)

D10 500 mkg

Description: Duplex DNA is 48502 base pairs in length. The molecular weight is 31.5x10⁶ daltons.

Concentration: 500 mkg/ml

Storage Buffer: 10 mM Tris-HCl (pH8.0) and 1 mM EDTA. Store at -20°C.

Lambda DNA

Isolated from bacteriophage lambda (c1857ind 1 Sam 7) obtained from heat inducible lysogen *E.coli* strain (dam⁺, dcm⁺).

D11 500 mkg

Description: Duplex DNA is 48502 base pairs in length. The molecular weight is 31.5x10⁶ daltons.

Concentration: 500 mkg/ml

Storage Buffer: 10 mM Tris-HCl (pH 8.0) and 1 mM EDTA. Store at -20°C.

T7 Phage DNA

Isolated from T7 phage obtained from infected *E.coli* strain

D02 500 mkg

Description: Duplex DNA is 39936 base pairs in length. The molecular weight is 26x10⁶ daltons.

Concentration: 500 mkg/ml.

Storage Buffer: 10 mM Tris-HCl (pH 8.0) and 1 mM EDTA. Store at -20°C.

pBR322 DNA

Isolated from *E.coli* XL1-Blue (dam⁺, dcm⁺).

D03 50 mkg

D04 250 mkg

Description: pBR322 is commonly used plasmid cloning vector in *E.coli*. The molecule is a double-stranded circle, 4361 base pairs in length. pBR322 contains the genes for resistance to ampicillin and tetracycline, and may be amplified with chloramphenicol. The molecular weight of pBR322 is 2.83x10⁶ daltons.

Concentration: 200 mkg/ml

Storage Buffer: 10 mM Tris-HCl (pH8.0) and 1 mM EDTA. Store at -20°C.

pHspAI2/GsaI DNA

pHspAI2 is isolated from *E.coli* (dam⁺,dcm⁺) by a standard plasmid purification procedure.



D09 10 mkg

Description: DNA pHspAI2/GsaI is a linearized plasmid pHspAI2, which includes a gene of DNA-methyltransferase M.HspAI (recognition sequence 5'-GCGC-3') and contains a unique GsaI canonical site 5'-G(5mC)G(5mC)-3'/3'-(5mC)G(5mC)G-5'.

Concentration: 200 mkg/ml

Storage Buffer: 10 mM Tris-HCl (pH8.0) and 1 mM EDTA. Store at -20°C.

pUC19 DNA

isolated from *E.coli* XL1-Blue (dam⁺, dcm⁺)

D05 50 mkg

D06 250 mkg

Description: pUC19 is commonly used plasmid cloning vector in *E.coli*. The molecule is a small double-stranded circle, 2686 base pairs in length, and has a high copy number. pUC19 carries a 54 base-pair multiple cloning site polylinker that contains unique sites for 13 different hexanucleotide-specific restriction endonucleases. The molecular weight of pUC19 is 1.75x10⁶ daltons

Concentration: 200 mkg/ml

Storage Buffer: 10 mM Tris-HCl (pH8.0) and 1 mM EDTA. Store at -20°C.

Human Genomic DNA

Genomic DNA HeLa



D07 10 mkg

Isolated from HeLa cervix adenocarcinoma cells.

Description: Human female HeLa genomic DNA.

Cells were grown to confluency in DMEM – 90%, plus fetal bovine serum – 10%.

Genomic DNA was isolated by a standard protocol [1].

Concentration: 200 mkg /ml.

Quality Control: Purified free of contaminating proteins and RNA

Storage Buffer: 10 mM Tris-HCl (pH 7.8), 1 mM EDTA. **Store at -20°C.**

Note: Avoid multiple freeze/thaw cycles.

1. Sambrook J. and Russell D. (2001) *Molecular Cloning: A Laboratory Manual*, (3rd ed.), pp. 6.4-6.12. Cold Spring Harbor: Cold Spring Harbor Laboratory Press.

Genomic DNA Jurkat



D08 10 mkg

Isolated from Jurkat acute T-cell leukemia cells.

Description: Human male Jurkat genomic DNA.

Cells were grown to confluency in RPMI-1640 – 90%, plus fetal bovine serum – 10%.

Genomic DNA was isolated by a standard protocol [1].

Concentration: 200 mkg /ml.

Quality Control: Purified free of contaminating proteins and RNA

Storage Buffer: 10 mM Tris-HCl (pH 7.8), 1 mM EDTA. **Store at -20°C.**

Note: Avoid multiple freeze/thaw cycles.

1. Sambrook J. and Russell D. (2001) *Molecular Cloning: A Laboratory Manual*, (3rd ed.), pp. 6.4-6.12. Cold Spring Harbor: Cold Spring Harbor Laboratory Press.

Genomic DNA L-68



D014 10 mkg

Isolated from L-68 fibroblast cells from lung.

Description: Human embryo L-68 genomic DNA.

Cells were grown to confluency in DMEM – 90%, plus fetal bovine serum – 10%.

Genomic DNA was isolated by a standard protocol [1].

Concentration: 200 mkg /ml.

Quality Control: Purified free of contaminating proteins and RNA

Storage Buffer: 10 mM Tris-HCl (pH 7.8), 1 mM EDTA. **Store at -20°C.**

Note: Avoid multiple freeze/thaw cycles.

1. Sambrook J. and Russell D. (2001) *Molecular Cloning: A Laboratory Manual*, (3rd ed.), pp. 6.4-6.12. Cold Spring Harbor: Cold Spring Harbor Laboratory Press.

Genomic DNA Raji



D13 10 mkg

Isolated from Raji Burkitt's lymphoma cells.

Description: Human male Raji genomic DNA.

Cells were grown to confluency in RPMI-1640 – 90%, plus fetal bovine serum – 10%.

Genomic DNA was isolated by a standard protocol [1].

Concentration: 200 mkg /ml.

Quality Control: Purified free of contaminating proteins and RNA

Storage Buffer: 10 mM Tris-HCl (pH 7.8), 1 mM EDTA. **Store at -20°C.**

Note: Avoid multiple freeze/thaw cycles.

1. Sambrook J. and Russell D. (2001) *Molecular Cloning: A Laboratory Manual*, (3rd ed.), pp. 6.4-6.12. Cold Spring Harbor: Cold Spring Harbor Laboratory Press.

Genomic DNA U-937



D12 10 mkg

Isolated from U-937 histiocytic lymphoma cells.

Description: Human male U-937 genomic DNA.

Cells were grown to confluency in RPMI-1640 – 90%, plus fetal bovine serum – 10%.

Genomic DNA was isolated by a standard protocol [1].

Concentration: 200 mkg /ml.


Quality Control: Purified free of contaminating proteins and RNA

Storage Buffer: 10 mM Tris-HCl (pH 7.8), 1 mM EDTA. **Store at -20°C.**

Note: Avoid multiple freeze/thaw cycles.

1. Sambrook J. and Russell D. (2001) *Molecular Cloning: A Laboratory Manual*, (3rd ed.), pp. 6.4-6.12. Cold Spring Harbor: Cold Spring Harbor Laboratory Press.

dNTPs(enzymatic)

dATP		Water solution Na-salt.	N011 N012	5 µmoles 25 µmoles
<p>Description: 2'-deoxyadenosine 5'-triphosphate sodium salt Concentration: 100 mM Method of production: enzymatic synthesis. dATP are Qualified free of nucleases and phosphatases. 15 Kb and longer DNA fragments may be amplified in PCR with this dNTP(enzymatic). Store at -20°C.</p>				
dCTP		Water solution Na-salt.	N013 N014	5 µmoles 25 µmoles
<p>Description: 2'-deoxycytidine 5'-triphosphate sodium salt Concentration: 100 mM Method of production: enzymatic synthesis. dCTP are Qualified free of nucleases and phosphatases. 15 Kb and longer DNA fragments may be amplified in PCR with this dNTP(enzymatic). Store at -20°C.</p>				
dGTP		Water solution Na-salt.	N015 N016	5 µmoles 25 µmoles
<p>Description: 2'-deoxyguanosine 5'-triphosphate sodium salt Concentration: 100 mM Method of production: enzymatic synthesis. dGTP are Qualified free of nucleases and phosphatases. 15 Kb and longer DNA fragments may be amplified in PCR with this dNTP(enzymatic). Store at -20°C.</p>				
dTTP		Water solution Na-salt.	N017 N018	5 µmoles 25 µmoles
<p>Description: 2'-deoxythymidine 5'-triphosphate sodium salt Concentration: 100 mM Method of production: enzymatic synthesis. dTTP are Qualified free of nucleases and phosphatases. 15 Kb and longer DNA fragments may be amplified in PCR with this dNTP(enzymatic). Store at -20°C.</p>				
dUTP		Water solution Na-salt.	N031 N032	5 µmoles 25 µmoles
<p>Description: 2'-deoxyuridine 5'-triphosphate sodium salt Concentration: 100 mM Method of production: enzymatic synthesis. dUTP are Qualified free of nucleases and phosphatases. 15 Kb and longer DNA fragments may be amplified in PCR with this dNTP(enzymatic). Store at -20°C.</p>				
dNTP Mix		0,5 µmol of each Water solution Na-salt.	N024	1 ml
<p>Description: Deoxynucleotide solution mix is an equimolar solution of ultrapure dATP, dCTP, dGTP and dTTP, each at a final concentration of 0,5 mM. Quantity: 1.0 ml contains 0,5 µmol of each dATP, dCTP, dGTP and dTTP. Application: For use in molecular biology and biotechnology, including PCR, long-PCR, and for labeling and sequencing DNA. PCR-diagnostics for medicine. Quality: Molecular Biology Grade. Functional test: The product has been tested for receiving products with length more than 15,000 base pair nucleotides with T7 phage DNA as a template. Store at -20°C.</p>				

dNTP Mix	2,5 µmol of each Water solution Na-salt.	N026	1 ml
<p>Description: Deoxynucleotide solution mix is an equimolar solution of ultrapure dATP, dCTP, dGTP and dTTP, each at a final concentration of 2,5 mM.</p> <p>Quantity: 1.0 ml contains 2,5 µmol of each dATP, dCTP, dGTP and dTTP.</p> <p>Application: For use in molecular biology and biotechnology, including PCR, long-PCR, and for labeling and sequencing DNA. PCR-diagnostics for medicine.</p> <p>Quality: Molecular Biology Grade.</p> <p>Functional test: The product has been tested for receiving products with length more than 15,000 base pair nucleotides with T7 phage DNA as a template.</p> <p>Store at -20°C.</p>			

dNTP Mix	4 µmol of each Water solution Na-salt.	N027	1 ml
<p>Description: Deoxynucleotide solution mix is an equimolar solution of ultrapure dATP, dCTP, dGTP and dTTP, each at a final concentration of 4 mM.</p> <p>Quantity: 1.0 ml contains 4 µmol of each dATP, dCTP, dGTP and dTTP.</p> <p>Application: For use in molecular biology and biotechnology, including PCR, long-PCR, and for labeling and sequencing DNA. PCR-diagnostics for medicine.</p> <p>Quality: Molecular Biology Grade.</p> <p>Functional test: The product has been tested for receiving products with length more than 15,000 base pair nucleotides with T7 phage DNA as a template.</p> <p>Store at -20°C.</p>			

dNTP Mix	10 µmol of each Water solution Na-salt.	N025	1 ml
<p>Description: Deoxynucleotide solution mix is an equimolar solution of ultrapure dATP, dCTP, dGTP and dTTP, each at a final concentration of 10 mM.</p> <p>Quantity: 1.0 ml contains 10 µmol of each dATP, dCTP, dGTP and dTTP.</p> <p>Application: For use in molecular biology and biotechnology, including PCR, long-PCR, and for labeling and sequencing DNA. PCR-diagnostics for medicine.</p> <p>Quality: Molecular Biology Grade.</p> <p>Functional test: The product has been tested for receiving products with length more than 15,000 base pair nucleotides with T7 phage DNA as a template.</p> <p>Store at -20°C.</p>			

Substrates

S-Adenosyl – L - methionine (SAM)



S005

100 mkl

Source: fermentative synthesis with subsequent purification

Description: S-Adenosyl-L-methionine (SAM) is a substrate for methyltransferases and a cofactor for some restriction endonucleases. SAM provided in 5 mM H₂SO₄ and 10% EtOH.

Formula: C₁₅H₂₃N₆O₅S

Molecular weight: 399,5

Concentration: 32 mM

Use and Storage: Store at -20°C.

The SAM solution should be thawed on ice and added into the reaction mixture immediately before the incubation. For use in a methylation reaction the SAM should be diluted to a final concentration of 80 μM.

Quality Control: the SAM is tested in a reaction of methylation of phage λ DNA with DNA-methyltransferase M.HspAI (SE #003).

Buffers composition

Cat #	Buffer	Contents ×1
B001	<u>B:</u>	10 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 1 mM DTT.
B002	<u>G:</u>	10 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 50 mM NaCl; 1 mM DTT.
B003	<u>O:</u>	50 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 100 mM NaCl; 1 mM DTT.
B004	<u>W:</u>	10 mM Tris-HCl (pH 8.5 at 25° C); 10 mM MgCl ₂ ; 100 mM NaCl; 1 mM DTT.
B005	<u>Y:</u>	33 mM Tris- acetate (pH 7.9 at 25° C); 10 mM magnesium acetate; 66 mM potassium acetate; 1 mM DTT.
B006	<u>2W:</u>	20 mM Tris-HCl (pH 8.5 at 25° C); 10 mM MgCl ₂ ; 200 mM NaCl; 1 mM DTT.
B007	<u>K:</u>	10 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 100 mM KCl; 1 mM DTT.
B008	<u>2K:</u>	10 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 200 mM KCl; 1 mM DTT.
B010	<u>AbsI:</u>	10 mM Tris-HCl (pH 9.0 at 25° C); 10 mM MgCl ₂ ; 50 mM KCl; 1 mM DTT.
B011	<u>EcoRI:</u>	100 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 50 mM NaCl; 1 mM DTT.
B012	<u>BisI</u>	10 mM Tris-HCl (pH 9.0 at 25° C); 10 mM MgCl ₂ ; 150 mM KCl; 1 mM DTT.
B014	<u>GlaI:</u>	10 mM Tris-HCl (pH 8.5 at 25° C); 5 mM MgCl ₂ ; 10 mM NaCl; 1 mM 2- mercaptoethanol.
B016	<u>Mall</u>	20 mM Tris-HCl (pH 9.0 at 25° C); 10 mM MgCl ₂ ; 150 mM NaCl; 1 mM DTT.
B017	<u>N-Bst9I:</u>	10 mM Tris-HCl (pH 8.5 at 25° C); 10 mM MgCl ₂ ; 150 mM KCl; 1 mM DTT.
B019	<u>PcsI</u>	10 mM Tris-HCl (pH 8.3 at 25° C); 20 mM NaCl; 3 mM MgCl ₂ ; 1 mM DTT.
B018	<u>RigI:</u>	10 mM Tris-HCl (pH 8.5 at 25° C); 5 mM MgCl ₂ ; 1 mM DTT
B301	<u>T4-Polynucleotide Kinase:</u>	50 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 5 mM DTT.
B302	<u>T4-DNA Ligase:</u>	50 mM Tris-HCl (pH 7.8 at 25° C); 10 mM MgCl ₂ ; 10 mM DTT; 1 mM ATP. Storage conditions: by small portions avoiding repeated defrosting to prevent ATP decomposition.
B303	<u>T4-RNA Ligase:</u>	50 mM Tris-HCl (pH 7.8 at 25° C); 10 mM MgCl ₂ ; 10 mM DTT; 1 mM ATP.
B304	<u>DNA polymerase I E.coli (Klenow Fragment):</u>	50 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 5 mM DTT.
B309	<u>Hot Start Taq DNA- polymerase:</u>	67 mM Tris-HCl (pH 8.8 at 25 C), 16.6 mM (NH ₄) ₂ SO ₄ , 0.01 % Tween-20. Supplementary material is 50 mM MgCl ₂ .
B310	<u>Pfu DNA- polymerase:</u>	20 mM Tris-HCl (pH 8.8 at 25° C), 10 mM KCl, 10 mM (NH ₄) ₂ SO ₄ , 2 mM MgSO ₄ , 0.1% Triton X-100.
B321	<u>AS (Ammonium Sulfate):</u>	67 mM Tris-HCl (pH 8.8 at 25 C), 16.6 mM (NH ₄) ₂ SO ₄ , 0.01 % Tween-20. Supplementary material is 50 mM MgCl ₂ .
B305	<u>Taq-DNA- polymerase , TaqSE-DNA- polymerase:</u>	60 mM Tris-HCl (pH 8.5 at 25° C); 1.5 mM MgCl ₂ ; 25 mM KCl; 10 mM 2- mercaptoethanol; 0.1% Triton X-100.
B306	<u>Taq-DNA- polymerase (Mg²⁺ – free):</u>	60 mM Tris-HCl (pH 8.5 at 25° C); 25 mM KCl; 10 mM 2- mercaptoethanol; 0.1% Triton X-100.
B311	<u>T4- DNA- polymerase:</u>	67 mM Tris-HCl (pH 8.8 at 25° C); 6.7 mM MgCl ₂ ; 16.7 mM (NH ₄) ₂ SO ₄ ; 1 mM DTT.
B319	<u>T7- RNA- polymerase:</u>	50 mM Tris-HCl (pH 7.5 at 25° C); 6 mM MgCl ₂ ; 10 mM DTT; 2 mM spermidine.
B312	<u>M-MuLV reverse transcriptase</u>	50 mM Tris-HCl (pH 8.3 at 25° C); 75 mM KCl; 3 mM MgCl ₂ , 10 mM DTT.
B313	<u>Inorganic pyrophosphatase</u>	50 mM Tris-HCl (pH 8.5 at 25° C); 1 mM MgCl ₂
B314	<u>BAL-31 nuclease:</u>	20 mM Tris-HCl (pH 8.0 at 25° C); 600 mM NaCl; 12 mM CaCl ₂ ; 12 mM MgCl ₂ ; 1 mM EDTA.
B315	<u>Mung Bean nuclease</u>	50 mM sodium acetate; 30 mM NaCl; 1 mM ZnSO ₄ ; (pH 5.0 at 25° C).
B316	<u>Exonuclease III:</u>	50 mM Tris-HCl (pH 7.6 at 25° C); 1 mM MgCl ₂ .
B317	<u>Endonuclease I:</u>	20 mM Glycin -NaOH (pH 9.5 at 25° C); 25 mM MgCl ₂ ; 100mM NaCl; 1 mM 2- mercaptoethanol.
B318	<u>Uracil-DNA-glycosylase:</u>	20 mM Tris-HCl (pH 8.0 at 25° C); 1 mM EDTA; 1 mM DTT.
B003	<u>Alkaline phosphatase:</u>	50 mM Tris-HCl (pH 7.6 at 25° C); 10 mM MgCl ₂ ; 100 mM NaCl; 1 mM DTT.
B100	<u>A (Storage and dilution buffer) :</u>	10 mM Tris-HCl (pH 7.6 at 25° C); 50 mM KCl; 0,1 mM EDTA; 200 µg/ml BSA; 1 mM DTT; 50% glycerol.
B307	<u>MgCl₂, 50 mM water solution</u>	50 mM MgCl ₂ ; 500 µl
B101	<u>BSA (for Restrictases)</u>	10 mg/ml BSA. ; 500 µl

SE Buffer Activity Chart for Restriction Enzymes

Enzyme	Recognition sequence	SE Buffer	BSA	Activity (% from maximum)					Optimum t, °C	Inactivation, 20min
				B	G	O	W	Y		
Aat II	GACGT [^] C	Y	-	10-25	25-50	10-25	25-50	100	37	65°C
Abs I	CC [^] TCGAGG	*	-	75-100	10-25	0	50-75	0-10	37	65°C
Acc16 I	TGC [^] GCA	W	-	50-75	75-100	25-50	100	75-100	37	65°C
Acc36 I	ACCTGC(4/8)	Y	-	25-50	25-50	50-75	50-75	100	37	65°C
Acc65 I	G [^] GTACC	W	-	10-25	25-50	75-100	100	10-25	37	65°C
AccB1 I	G [^] GYRCC	K	+	50-75	10-25	10-25	75-100	50-75	37	65°C
AccB7 I	CCANNNN [^] NTGG	G	-	10-25	100	25-50	50-75	50-75	37	65°C
AccBS I	GAG [^] CGG	Y	-	75-100	75-100	25-50	25-50	100	37	65°C
Acl I	AA [^] CGTT	Y	+	0-10	0-10	0-10	0-10	100	37	65°C
AclW I	GGATC(4/5)	Y	+	75-100	50-75	0-10	0-10	100	37	65°C
Aco I	Y [^] GGCCR	G	-	50-75	100	50-75	25-50	75-100	37	65°C
Acs I	R [^] AATTY	W	+	25-50	50-75	50-75	100	10-25	50	80°C
Acu I	CTGAAG(16/14)	Y+SAM	+	25-50	50-75	50-75	75-100	100	37	65°C
Afe I	AGC [^] GCT	Y	-	10-25	25-50	75-100	75-100	100	37	65°C
Ags I	TTS [^] AA	Y	+	75-100	50-75	10-25	10-25	100	37	65°C
Ahl I	A [^] CTAGT	B	+	100	75-100	25-50	25-50	75-100	37	No
Ajn I	[^] CCWGG	Y	-	25-50	10-25	10-25	25-50	100	55	65°C
Alu I	AG [^] CT	Y	-	75-100	75-100	10-25	50-75	100	37	65°C
AluB I	AG [^] CT	B	+	100	75-100	10-25	10-25	75-100	37	65°C
Ama87 I	C [^] YCGRG	W	+	10-25	50-75	75-100	100	0-10	37	65°C
Apa I	GGGCC [^] C	Y	+	50-75	25-50	0-10	0-10	100	37	65°C
Ars I	(8/13)GAC(N) ₆ TTYG(11/6)	Y	+	0	0	0	0	100	30	65°C
AsiG I	A [^] CCGGT	O	-	10-25	25-50	100	75-100	10-25	37	65°C
AsiS I	GCGAT [^] CGC	B	-	100	75-100	0-10	10-25	25-50	37	80°C
AspA2 I	C [^] CTAGG	W	+	10-25	50-75	75-100	100	75-100	37	80°C
AspLE I	GCG [^] C	O	-	0-25	75-100	100	50-75	25-50	37	80°C
AspS9 I	G [^] GNCC	W	-	50-75	50-75	75-100	100	50-75	37	65°C
AsuC2 I	CC [^] SGG	Y	-	75-100	50-75	10-25	25-50	100	37	65°C
AsuHP I	GGTGA(8/7)	O	-	10-25	50-75	100	75-100	25-50	37	65°C
AsuNH I	G [^] CTAGC	Y	+	75-100	50-75	0-10	0-10	100	37	65°C
BamH I	G [^] GATCC	G	+	25-50	100	75-100	75-100	25-50	37	65°C
Bar I	(7/12)GAAG(N) ₆ TAC(12/7)	2K	-	0	0-10	25-50	50-75	10-25	37	65°C
Bbv12 I	GWGCW [^] C	O	-	0-10	10-25	100	75-100	10-25	37	80°C
Bgl I	GCCNNNN [^] NGGC	2W	-	50-75	50-75	0-10	75-100	25-50	37	65°C
Bgl II	A [^] GATCT	O	-	0-10	10-25	100	25-50	10-25	37	80°C
Bis I	G(5mC) [^] NGC	*	-	10-25	25-50	50-75	75-100	50-75	37	65°C
Bls I	G(5mC)N [^] GC	W	-	10-25	10-25	50-75	100	75-100	30	65°C
Bme18 I	G [^] GWCC	O	-	10-25	25-50	100	75-100	10-25	37	65°C
Bmt I	GCTAG [^] C	W	-	10-25	50-75	50-75	100	75-100	37	65°C
BmuI	ACTGGG(5/4)	Y	-	75-100	75-100	25-50	50-75	100	37	65°C
Bpm I	CTGGAG(16/14)	W	+	25-50	50-75	75-100	100	50-75	37	65°C
Bpu10 I	CC [^] TNAGC	K	-	10-25	25-50	50-75	50-75	25-50	37	80°C
Bpu14 I	TT [^] CGAA	G	-	50-75	100	25-50	25-50	75-100	37	65°C
Bsa29 I	AT [^] CGAT	G	+	25-50	100	50-75	50-75	75-100	37	65°C
Bsc4 I	CCNNNNN [^] NNGG	W	+	75-100	75-100	50-75	100	25-50	55	80°C
BseI I	ACTGG(1/-1)	Y	-	75-100	75-100	25-50	10-25	100	65	80°C
Bse118 I	R [^] CCGGY	O	-	0-10	50-75	100	75-100	25-50	65	80°C
Bse21 I	CC [^] TNAGG	Y	-	50-75	50-75	10-25	25-50	100	37	80°C
Bse3D I	GCAATG(2/0)	G	-	10-25	100	25-50	50-75	75-100	60	80°C
Bse8 I	GATNN [^] NNATC	G	-	25-50	100	75-100	75-100	50-75	60	80°C
BsePI	G [^] CGCGC	G	-	50-75	100	75-100	50-75	50-75	50	65°C
BseX3 I	C [^] GGCCG	O	-	10-25	25-50	100	50-75	10-25	50	80°C
BslFI	GGGAC(10/14)	Y	+	25-50	25-50	10-25	25-50	100	37	80°C
Bso31 I	GGTCTC(1/5)	O	+	25-50	75-100	100	75-100	25-50	55	80°C
Bsp13 I	T [^] CCGGA	2K	-	25-50	50-75	75-100	50-75	0-10	50	65°C
Bsp1720 I	GC [^] TNAGC	G	-	50-75	100	50-75	50-75	75-100	37	80°C
Bsp19 I	C [^] CATGG	2W	+	0-10	10-25	50-75	75-100	10-25	37	65°C

* - supplied with its own unique reaction buffer that is different from the five standard SE-Buffers.

SE Buffer Activity Chart for Restriction Enzymes

Enzyme	Recognition sequence	SE Buffer	BSA	Activity (% from maximum)					Optimum t ₀ C	Inactivation, 20min
				B	G	O	W	Y		
BspAC I	CCGC(-3/-1)	O	+	10-25	25-50	100	75-100	10-25	37	65°C
BspFN I	CG^CG	Y	-	50-75	75-100	75-100	50-75	100	37	65°C
BssEC I	C^CNNGG	Y	-	50-75	50-75	50-75	75-100	100	60	80°C
BssNA I	GTA^TAC	W	+	50-75	50-75	75-100	100	75-100	37	No
BssT1 I	C^CWGG	2K	-	10-25	25-50	25-50	75-100	10-25	60	80°C
Bst2B I	CTCGTG(-5/-1)	Y	+	75-100	25-50	10-25	25-50	100	60	80°C
Bst2U I	CC^WGG	G	+	75-100	100	50-75	50-75	10-25	60	80°C
Bst4C I	ACN^GT	Y	-	75-100	75-100	10-25	25-50	100	65	80°C
Bst6 I	CTCTTC(1/4)	Y	+	75-100	75-100	50-75	75-100	100	65	80°C
BstAC I	GR^CGYC	W	-	75-100	75-100	50-75	100	75-100	37	80°C
BstAF I	C^TTAAG	W	+	10-25	25-50	75-100	100	25-50	55	80°C
BstAP I	GCANNN^NTGC	W	-	25-50	25-50	75-100	100	25-50	60	80°C
BstAU I	T^GTACA	W	-	10-25	50-75	25-50	100	25-50	37	80°C
BstBA I	YAC^GTR	W	+	25-50	25-50	75-100	100	25-50	65	80°C
BstC8 I	GCN^NGC	Y	-	10-25	25-50	50-75	75-100	100	55	80°C
BstDE I	C^TNAG	G	-	75-100	100	25-50	50-75	10-25	60	80°C
BstDS I	C^CRYGG	Y	-	0-10	75-100	50-75	25-50	100	65	80°C
BstEN I	CCTNN^NNNAGG	Y	-	50-75	50-75	25-50	25-50	100	65	80°C
BstF5 I	GGATG(2/0)	Y	-	75-100	50-75	25-50	50-75	100	65	80°C
BstFN I	CG^CG	Y	-	75-100	50-75	25-50	25-50	100	60	80°C
BstH2 I	RGCGC^Y	Y	+	50-75	50-75	0-10	10-25	100	65	80°C
BstHH I	GCG^C	Y	+	75-100	50-75	25-50	50-75	100	50	No
BstKI I	GAT^C	W	-	25-50	50-75	75-100	100	50-75	37	65°C
BstMA I	GTCTC(1/5)	W	+	25-50	50-75	50-75	100	75-100	55	65°C
BstMB I	^GATC	O	-	10-25	25-50	100	75-100	10-25	65	80°C
BstMC I	CGRY^CG	B	+	100	75-100	10-25	10-25	50-75	50	80°C
BstMW I	GCNNNN^NNGC	Y	-	10-25	25-50	25-50	50-75	100	55	80°C
BstNS I	RCATG^Y	B	+	100	50-75	10-25	10-25	75-100	37	65°C
BstPA I	GACNN^NNGTC	Y	-	50-75	25-50	50-75	50-75	100	65	No
BstSC I	^CCNGG	Y	-	50-75	50-75	50-75	50-75	100	55	80°C
BstSF I	C^TRYAG	O	+	75-100	25-50	100	50-75	50-75	60	No
BstSL I	GKGCMA^C	G	+	50-75	100	50-75	75-100	75-100	55	65°C
BstSN I	TAC^GTA	B	-	100	50-75	0-10	10-25	50-75	37	80°C
BstV1 I	GACAG(8/12)	G	-	75-100	100	75-100	75-100	75-100	55	80°C
BstV2 I	GAAGAC(2/6)	Y	+	75-100	75-100	25-50	25-50	100	55	65°C
BstX I	CCANNNN^NTGG	O	-	10-25	10-25	100	75-100	25-50	37	65°C
BstX2 I	R^GATCY	G	-	75-100	100	0-10	10-25	25-50	60	80°C
Bsu I	GTATCC(6/5)	Y	-	75-100	50-75	10-25	25-50	100	37	65°C
BsuR I	GG^CC	G	-	75-100	100	25-50	50-75	50-75	37	80°C
Btr I	CACGTC(-3/-3)	O	+	75-100	75-100	100	75-100	75-100	60	80°C
Cci I	T^CATGA	W	+	0-10	10-25	25-50	100	75-100	55	80°C
CciN I	GC^GGCCGC	Y	-	25-50	50-75	75-100	75-100	100	37	65°C
Dra I	TTT^AAA	G	+	75-100	100	25-50	75-100	75-100	37	65°C
Dra III	CACNN^GTG	2K	+	25-50	50-75	75-100	75-100	50-75	37	65°C
Dri I	GACNN^NNGTC	Y	-	75-100	75-100	10-25	10-25	100	37	65°C
DseD I	GACNNN^NNGTC	Y	+	75-100	75-100	25-50	50-75	100	37	80°C
EcoICR I	GAG^CTC	G	+	75-100	100	0-10	0-10	75-100	37	65°C
EcoR I	G^AATTC	*	+	50-75	75-100	75-100	100	50-75	37	65°C
EcoR V	GAT^ATC	W	+	0-10	25-50	50-75	100	25-50	37	80°C
Ege I	GGC^GCC	B	+	100	75-100	10-25	50-75	75-100	37	65°C
Erh I	C^CWGG	2W	+	10-25	25-50	25-50	75-100	10-25	37	65°C
Fae I	CATG^	Y	+	25-50	50-75	10-25	10-25	100	37	65°C
Fai I	YA^TR	B	-	100	50-75	10-25	25-50	25-50	50	80°C
Fal I	(8/13)AAG(N) ₅ CTT(13/8)	W+SAM	-	0-10	25-50	75-100	100	50-75	37	65°C
Fat I	^CATG	G	-	10-25	100	25-50	10-25	50-75	55	65°C
Fau I	CCCGC(4/6)	B	-	100	25-50	0-10	0-10	50-75	55	65°C
FauND I	CA^TATG	Y	+	50-75	75-100	10-25	50-75	100	37	65°C

* - supplied with its own unique reaction buffer that is different from the five standard SE-Buffers.

SE Buffer Activity Chart for Restriction Enzymes

Enzyme	Recognition sequence	SE Buffer	BSA	Activity (% from maximum)					Optimum t, ^o C	Inactivation, 20min
				B	G	O	W	Y		
Fbl I	GT ^o MKAC	Y	-	50-75	75-100	0-10	50-75	100	55	80°C
Fok I	GGATG(9/13)	Y	-	50-75	50-75	25-50	25-50	100	37	65°C
FriO I	GRGCY ^o C	Y	+	75-100	75-100	10-25	0-10	100	37	65°C
Fsp4H I	GC ^o NGC	Y	-	50-75	75-100	10-25	25-50	100	37	65°C
Gla I	G(5mC) ^o G(5mC)	*	-	75-100	75-100	75-100	75-100	90-100	30	65°C
Glu I	(5mC)G(5mC) ^o NG(5mC)	2K	-	25-50	25-50	75-100	75-100	25-50	50	65°C
Gsa I	CCCAG ^o C	W	+	10-25	25-50	75-100	100	75-100	70	No
Hae III	GG ^o CC	G	-	75-100	100	25-50	50-75	50-75	37	80°C
Hga I	GACGC(5/10)	B	-	100	75-100	10-25	25-50	50-75	37	65°C
Hind II	GTY ^o RAC	G	+	75-100	100	25-50	25-50	75-100	37	65°C
Hind III	A ^o AGCTT	W	+	10-25	25-50	0-10	100	0-10	37	80°C
Hinf I	G ^o ANTC	O	-	25-50	75-100	100	75-100	75-100	37	80°C
Hpa I	GTT ^o AAC	Y	-	0-10	50-75	10-25	25-50	100	37	65°C
Hpa II	C ^o CGG	B	-	100	50-75	10-25	25-50	50-75	37	80°C
HspA I	G ^o CGC	Y	-	50-75	50-75	25-50	25-50	100	37	80°C
Kpn I	GGTAC ^o C	B	+	100	25-50	25-50	25-50	75-100	37	80°C
Kro I	G ^o C(5mC)GGC	G	-	50-75	100	25-50	50-75	75-100	37	65°C
Ksp22 I	T ^o GATCA	2K	+	50-75	100	50-75	50-75	25-50	37	65°C
Kzo9 I	^o GATC	G	-	50-75	100	50-75	50-75	50-75	37	65°C
Mab I	A ^o CCWGGT	W	+	25-50	50-75	75-100	100	50-75	37	65°C
Mal I	G(mA) ^o TC	*	-	25-50	25-50	50-75	75-100	50-75	37	65°C
Mbo II	GAAGA(8/7)	Y	-	75-100	75-100	25-50	50-75	100	37	65°C
Mfe I	C ^o AATTG	B	+	100	75-100	10-25	25-50	75-100	37	80°C
Mhl I	GDGCH ^o C	W	-	10-25	25-50	75-100	100	10-25	37	80°C
Mlu I	A ^o CGCGT	O	-	0-10	10-25	100	25-50	10-25	37	65°C
Mly113 I	GG ^o CGCC	B	-	100	25-50	10-25	10-25	50-75	37	65°C
Mnl I	CCTC(7/6)	G	+	75-100	100	25-50	25-50	75-100	37	65°C
MroN I	G ^o CCGGC	B	-	100	50-75	10-25	0-10	10-25	37	80°C
MroX I	GAANN ^o NNTTC	W	-	50-75	50-75	50-75	100	25-50	37	65°C
Msp I	C ^o CGG	B	-	100	75-100	50-75	75-100	75-100	37	65°C
Msp20 I	TGG ^o CCA	W	+	50-75	50-75	25-50	100	50-75	37	65°C
MspA1 I	CMG ^o CKG	Y	-	10-25	75-100	10-25	25-50	100	37	65°C
MspR9 I	CC ^o NGG	O	-	50-75	50-75	100	50-75	75-100	37	80°C
Nru I	TCG ^o CGA	W	-	0-10	10-25	75-100	100	10-25	37	80°C
PalA I	GG ^o CGCGCC	Y	-	25-50	10-25	0	0	100	37	65°C
Pce I	AGG ^o CCT	Y	-	75-100	75-100	50-75	25-50	100	50	80°C
Pci I	A ^o CATGT	O	-	50-75	75-100	100	75-100	50-75	37	65°C
PciS I	GCTCTTC(1/4)	B	-	100	50-75	0-10	0-10	75-100	37	65°C
Pcs I	W(5mC)GNNNN ^o NNN(5mC)GW	*	DMSO	50-75	25-50	0	10-25	50-75	37	65°C
Pct I	GAATGC(1/-1)	O	-	25-50	50-75	100	75-100	10-25	37	65°C
Ple19 I	CGAT ^o CG	Y	-	75-100	75-100	25-50	25-50	100	37	65°C
Pps I	GAGTC(4/5)	Y	+	50-75	10-25	0-10	25-50	100	37	65°C
Psi I	TTA ^o TAA	B	-	100	25-50	10-25	25-50	75-100	37	65°C
Psp124B I	GAGCT ^o C	G	-	75-100	100	10-25	0-10	75-100	37	80°C
Psp6I	^o CCWGG	B	-	100	50-75	10-25	25-50	75-100	55	80°C
PspC I	CAC ^o GTG	B	+	100	50-75	0	0	50-75	37	65°C
PspE I	G ^o GTNACC	B	-	100	50-75	25-50	50-75	50-75	37	65°C
PspL I	C ^o GTACG	Y	+	75-100	75-100	25-50	10-25	100	37	65°C
PspN4 I	GGN ^o NCC	Y	-	10-25	10-25	10-25	25-50	100	37	65°C
PspOM I	G ^o GGCCC	Y	-	75-100	10-25	0-10	0-10	100	37	65°C
PspPP I	RG ^o GWCCY	Y	+	50-75	25-50	10-25	10-25	100	37	65°C
PspX I	VC ^o TCGAGB	Y	+	50-75	50-75	25-50	75-100	100	37	80°C
Psr I	(7/12)GAAC(N) ₆ TAC(12/7)	Y	+	10-25	10-25	0	0-10	100	30	65°C
Pst I	CTGCA ^o G	O	+	10-25	25-50	100	25-50	25-50	37	80°C
PstN I	CAGNNN ^o CTG	Y	-	75-100	50-75	10-25	25-50	100	37	65°C
Pvu II	CAG ^o CTG	G	+	25-50	100	25-50	25-50	25-50	37	80°C
Rga I	GCGAT ^o CGC	Y	-	75-100	50-75	10-25	25-50	100	55	80°C
Rig I	GGCCGG ^o CC	*	+	75-100	50-75	0-10	10-25	50-75	37	65°C

* - supplied with its own unique reaction buffer that is different from the five standard SE-Buffers.

SE Buffer Activity Chart for Restriction Enzymes

Enzyme	Recognition sequence	SE Buffer	BSA	Activity (% from maximum)					Optimum t, °C	Inactivation, 20min
				B	G	O	W	Y		
Rsa I	GT [^] AC	B	-	100	50-75	0-10	50-75	75-100	37	80°C
RsaN I	G [^] TAC	B	-	100	75-100	50-75	50-75	75-100	37	80°C
Rsr2 I	CG [^] GWCCG	Y	+	50-75	75-100	0-10	10-25	100	37	65°C
Sal I	G [^] TCGAC	O	-	0-10	10-25	100	25-50	0-10	37	65°C
Sbf I	CCTGCA [^] GG	Y	-	75-100	50-75	0-10	0-10	100	37	80°C
Set I	ASST [^]	Y	-	25-50	25-50	75-100	75-100	100	55	80°C
SfaN I	GCATC(5/9)	O	-	10-25	25-50	100	75-100	0-10	37	80°C
Sfi I	GGCCNNNN [^] NGGCC	G	+	75-100	100	25-50	25-50	25-50	50	65°C
Sfr274 I	C [^] TCGAG	B	-	100	75-100	50-75	50-75	75-100	50	65°C
Sfr303 I	CCGC [^] GG	B	-	100	50-75	10-25	10-25	75-100	37	65°C
Sma I	CCC [^] GGG	Y	-	0-10	0-10	0-10	0-10	100	25	65°C
Smi I	ATTT [^] AAAT	O	+	25-50	25-50	100	75-100	25-50	37	65°C
SmiM I	CAYNN [^] NNRTG	W	-	10-25	10-25	75-100	100	10-25	37	65°C
Sph I	GCATG [^] C	G	+	25-50	100	75-100	75-100	50-75	37	65°C
Sse9 I	[^] AATT	B	+	100	75-100	50-75	50-75	75-100	55	65°C
Ssp I	AAT [^] ATT	K	+	75-100	50-75	25-50	50-75	75-100	37	65°C
Taq I	T [^] CGA	Y	+	50-75	75-100	75-100	50-75	100	65	80°C
Tru9 I	T [^] TAA	W	-	75-100	25-50	25-50	100	50-75	65	80°C
Tth111 I	GACN [^] NNGTC	Y	-	75-100	50-75	10-25	10-25	100	65	80°C
Vne I	G [^] TGCAC	O	-	10-25	25-50	100	25-50	25-50	37	65°C
Vsp I	AT [^] TAAT	W	-	0-10	10-25	50-75	100	25-50	37	65°C
Xba I	T [^] CTAGA	O	+	75-100	75-100	100	50-75	75-100	37	65°C
Xma I	C [^] CCGGG	Y	-	75-100	50-75	0	0-10	100	37	65°C
Zra I	GAC [^] GTC	B	-	100	50-75	25-50	25-50	75-100	37	80°C
Zrm I	AGT [^] ACT	Y	+	50-75	25-50	0-10	0-10	100	37	65°C
Zsp2 I	ATGCA [^] T	B	+	100	50-75	25-50	25-50	25-50	37	65°C
N·Bst9 I	GAGTC(4/-)	*	-	10-25	75-100	100	100	50-75	55	80°C

* - supplied with its own unique reaction buffer that is different from the five standard SE-Buffers.

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Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme
AanI	PsiI	AsuNHI	AsuNHI	BseB1	Bst2U1	BspX1	Bsa29I	BstY1	BstX2I
AasI	DseDI		BmtI [^]		Psp6I [^]	BsrI	Bse1I	BstZ1	BseX3I
AatI	PceI	AvaI	Ama87I	BseCI	Bsa29I	BsrB1	AccBSI	BstZ17I	BssNAI
AatII	AatII	AvaII	Bme18I	BseDI	BssECI	BsrDI	Bse3DI	BsuI	BsuI
AbsI	AbsI	AvaIII	Zsp2I [^]	Bse3DI	Bse3DI	BsrFI	Bse118I	Bsu15I	Bsa29I
AccI	FblI	AviII	Acc16I	BseGI	BstF5I	BsrGI	BstAUI	Bsu36I	Bse21I
AccII	BstFNI	AvrII	AspA2I	BseGI	FokI [^]	BsrSI	Bse1I	BsuRI	BsuRI
AccIII	Bsp13I	AxyI	Bse21I	BseJI	Bse8I	BssAI	Bse118I		HaeIII
Acc16I	Acc16I	Ball	Msp20I	BseLI	Bsc4I	BssECI	BssECI	BsuTUI	Bsa29I
Acc36I	Acc36I	BamHI	BamHI	BseMI	Bse3DI	BssHI	Sfr274I	BtgI	BstDSI
Acc65I	Acc65I	BanI	AccB1I	BseNI	Bse1I	BssHII	BsePI	BtrI	BtrI
	KpnI [^]	BanII	FriOI	BsePI	BsePI	BssKI	MspR9I [^]	BveI	Acc36I
AccB1I	AccB1I	BanIII	Bsa29I	BseSI	BstSLI		BstSCI	Cac8I	BstC8I
AccB7I	AccB7I	BarI	BarI	BseXI	BstV1I	BssNAI	BssNAI	CaiI	PstNI
AccBSI	AccBSI	BbeI	EgeI [^]	BseX3I	BseX3I	BssSI	Bst2BI	CaII	AsuC2I
Acil	BspACI		Mly113I ^{^^}	BseYI	GsaI	BssT1I	BssT1I	CciI	CciI
AcII	AcII	BbrPI	PspCI	Bsh1236I	BstFNI		ErhI	CciNI	CciNI
AcIWI	AcIWI	BbsI	BstV2I	Bsh1285I	BstMCI	Bst6I	Bst6I	CellI	Bsp1720I
AcoI	AcoI	BbuI	SphI	BshFI	BsuRI	Bst98I	BstAFI	CfoI	AsPLEI
AcsI	AcsI	BbvI	BstV1I		HaeIII	Bst1107I	BssNAI		BstHHI
AcuI	AcuI	BbvII	BstV2I	BshNI	AccB1I	BstACI	BstACI		HspAI [^]
AcvI	PspCI	Bbv12I	Bbv12I	BshTI	AsiGI	BstAFI	BstAFI	CfrI	AcoI
AcyI	BstACI	BclI	Ksp22I	BsiI	Bst2BI	BstAPI	BstAPI	Cfr9I	XmaI
Adel	DraIII	BciVI	BsuI	BsiEI	BstMCI	BstAUI	BstAUI		SmaI [^]
AfaI	RsaI	BenI	AsuC2I	BsiHKA1	Bbv12I	BstBI	Bpu14I	Cfr10I	Bse118I
AfeI	AfeI	BcuI	AhlI	BsiHKCI	Ama87I	Bst2BI	Bst2BI	Cfr13I	AspS9I
AfIII	BstAFI	BfiI	BmuI	BsiSI	HpaII	BstBAI	BstBAI	Cfr42I	Sfr303I
AgeI	AsiGI	BfmI	BstSFI		MspI	Bst4CI	Bst4CI	Clal	Bsa29I
AgsI	AgsI	BfrI	BstAFI	BsiWI	PspLI	BstC8I	BstC8I	CpoI	Rsr2I
AhaIII	DraI	BfrBI	Zsp2I [^]	BsiYI	Bsc4I	BstDEI	BstDEI	CspI	Rsr2I
AhdI	DriI	BfuI	BsuI	BsII	Bsc4I	BstDSI	BstDSI	Csp6I	RsaI [^]
AhlI	AhlI	BfuAI	Acc36I	BsIFI	BsIFI	BstEII	PspEI	Csp45I	Bpu14I
Ajnl	Ajnl	BfuCI	BstMBI	BsmFI	BsIFI [^]	BstENI	BstENI	CspAI	AsiGI
	Bst2UI [^]		BstKT1 [^]	BsmI	PctI	BstF5I	BstF5I	CviAI	FaeI ^{^^}
	Psp6I		Kzo9I	BsmAI	BstMAI		FokI [^]		FatI [^]
AluI	AluI	BglI	BglI	Bso3II	Bso3II	BstFNI	BstFNI	DdeI	BstDEI
	AluBI	BglII	BglII	BsoBI	Ama87I	BstH2I	BstH2I	DpnI	MalI
AluBI	AluBI	BinI	AcIWI	BsoMAI	BstMAI	BstHHI	BstHHI	DpnII	BstMBI
AlwI	AcIWI	BisI	BisI	Bsp13I	Bsp13I		AspLEI		Kzo9I
Alw21I	Bbv12I	BlnI	AspA2I	Bsp19I	Bsp19I		HspAI [^]		BstKTI [^]
Alw26I	BstMAI	BlpI	Bsp1720I	Bsp68I	NruI	BstKTI	BstKTI	DraI	DraI
Alw44I	VneI	BlsI	BlsI	Bsp106I	Bsa29I		BstMBI [^]	DraIII	DraIII
AlwNI	PstNI	Bme18I	Bme18I	Bsp106I	Bsa29I		Kzo9I [^]	DrdI	DseDI
Ama87I	Ama87I	Bme1390I	MspR9I	Bsp119I	Bpu14I	BstMBI	BstKTI [^]	DriI	DriI
Aor51HI	AfeI		BstSCI [^]	Bsp120I	PspOMI		BstMBI	DsaI	BstDSI
					ApaI [^]		BstMBI	DseDI	DseDI
Apal	Apal	BmgBI	BtrI	Bsp143I	BstMBI		Kzo9I	EaeI	AcoI
	PspOMI [^]	BmtI	BmtI		Kzo9I	BstMCI	BstMCI	EagI	BseX3I
Apabi	BstAPI [^]		AsuNHI [^]		BstKTI [^]	BstMWI	BstMWI	Eam1104I	Bst6I
Apali	VneI	BmyI	MhII	Bsp143II	BstH2I	BstNI	AjnI [^]	Eam1105I	DriI
ApoI	AcsI	BoxI	BstPAI	Bsp1286I	MhII		Bst2UI	EarI	Bst6I
ArsI	ArsI	BpiI	BstV2I	Bsp1407I	BstAUI		Psp6I [^]	Ecl136II	EcoICRI
AscI	PalAI	Bpml	Bpml	Bsp1720I	Bsp1720I	BstNSI	BstNSI		Psp124BI [^]
AseI	VspI	Bpu10I	Bpu10I	BspACI	BspACI	BstOI	AjnI [^]	EclHKI	DriI
AsiGI	AsiGI	Bpu14I	Bpu14I	BspANI	BsuRI		Bst2UI	EclXI	BseX3I
AsiSI	AsiSI	Bpu1102I	Bsp1720I		HaeIII		Psp6I [^]	Eco24I	FriOI
AspI	Tth111I	BpuAI	BstV2I	BspCI	Ple19I	BstPI	PspEI	Eco31I	Bso31I
Asp700I	MroXI	BsaI	Bso31I	BspDI	Bsa29I	BstPAI	BstPAI	Eco32I	EcoRV
Asp718I	Acc65I	Bsa29I	Bsa29I	BsePI	Bsp13I	BstSCI	BstSCI	Eco47I	Bme18I
	KpnI [^]	BsaAI	BstBAI	BspFNI	BspFNI		MspR9I [^]	Eco47III	AfeI
AspA2I	AspA2I	BsaBI	Bse8I	BspHI	CciI	BstSFI	BstSFI	Eco52I	BseX3I
AspEI	DriI	BsaHI	BstACI	BspLI	PspN4I	BstSLI	BstSLI	Eco57I	AcuI
AspHI	Bbv12I	BsaJI	BssECI	BspLU11I	PciI	BstSNI	BstSNI	Eco72I	PspCI
AspLEI	AspLEI	BsaMI	PctI	BspMI	Acc36I	BstUI	BstFNI	Eco81I	Bse21I
	BstHHI	Bsc4I	Bsc4I	BspMII	Bsp13I	Bst2UI	AjnI [^]	Eco88I	Ama87I
	HspAI [^]	Bse1I	Bse1I	BspMAI	PstI		Bst2UI	Eco91I	PspEI
AspS9I	AspS9I	Bse8I	Bse8I	BspPI	AcIWI		Psp6I [^]	Eco105I	BstSNI
AsuI	AspS9I	Bse21I	Bse21I	BspTI	BstAFI	BstV1I	BstV1I	Eco130I	BstT1I
AsuII	Bpu14I	Bse118I	Bse118I	BspT104I	Bpu14I	BstV2I	BstV2I		ErhI
AsuC2I	AsuC2I	BseAI	Bsp13I	BspT107I	AccB1I	BstXI	BstXI		
AsuHPI	AsuHPI	BseBI	AjnI [^]	BspTNI	Bso31I	BstX2I	BstX2I	Eco147I	PceI

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Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme	Enzyme	SE Enzyme
EcoICRI	EcoICRI	HincII	HindII	MunI	MfeI	PspAI	SmaI [^]	SmaI	SmaI
	Psp124BI [^]	HindIII	HindIII	MvaI	AjnI [^]		XmaI		XmaI [^]
EcoNI	BstENI	HindIII	HindIII		Bst2UI	Psp124BI	EcoICRI [^]	SmiI	SmiI
EcoO65I	PspEI	HinfI	HinfI		Psp6I [^]		Psp124BI	SmiMI	SmiMI
EcoRI	EcoRI	HpaI	HpaI	Mva1269I	PctI	PspCI	PspCI	SmuI	FauI
EcoRII	AjnI	HpaII	HpaII	MvnI	BstFNI	PspEI	PspEI	SnaI	BssNAI
	Bst2UI [^]		MspI	MwoI	BstMWI	PspGI	AjnI	SnaBI	BstSNI
	Psp6I	HphI	AsuHPI	NaeI	MroNI [^]		Bst2UI [^]	SpaHI	SphI
EcoRV	EcoRV	HpyCH4III	Bst4CI	NarI	EgeI [^]		Psp6I	SpeI	AhlI
EcoT14I	BssT1I	HpyF10VI	BstMWI		Mly113I	PspLI	PspLI	SphI	SphI
	ErhI	Hsp92I	BstACI	NciI	AsuC2I	PspN4I	PspN4I	SplI	PspLI
EcoT22I	Zsp2I	Hsp92II	FatI [^]	NcoI	Bsp19I	PspOMI	Apal [^]	Sse9I	Sse9I
EcoT38I	FriOI	HspAI	AspLEI [^]	NdeI	FauNDI		PspOMI	Sse8387I	SbfI
EgeI	EgeI		BstHHI [^]	NdeII	BstMBI	PspPI	AspS9I	SseBI	PceI
	Mly113I [^]		HspAI		Kzo9I	PspPPI	PspPPI	SsiI	BspACI
EheI	EgeI	ItaI	Fsp4HI		BstKTI [^]	PspXI	PspXI	Sspl	SspI
	Mly113I [^]	KasI	EgeI [^]	NgoMIV	MroNI	Psrl	Psrl	SspBI	BstAUI
ErhI	BssT1I		Mly113I ^{^^}	NheI	AsuNHI	PstI	PstI	SstI	EcoICRI [^]
	ErhI	KpnI	KpnI		BmtI [^]	PsuI	BstX2I		Psp124BI
EspI	Bsp1720I		Acc65I [^]	NlaIII	FaeI	PsyI	Tth111I	StuI	PceI
FaeI	FaeI	Kpn2I	Bsp13I		FatI [^]	PvuI	Ple19I	StyI	BssT1I
FaiI	FaiI	KroI	KroI	NlaIV	PspN4I	PvuII	PvuII		ErhI
FalI	FalI	KspI	Sfr303I	NotI	CciNI	RgaI	RgaI	StyD4I	BstSCI
FatI	FaeI [^]	Ksp22I	Ksp22I	NruI	NruI	RigI	RigI	StyD4I	MspR9I [^]
	FatI	Ksp632I	Bst6I	NsbI	Acc16I	RsaI	RsaI	SunI	PspLI
FauI	FauI	KspAI	HpaI	NsiI	Zsp2I		RsaNI [^]	SwaI	SmiI
FauNDI	FauNDI	Kzo9I	BstMBI	NspI	BstNSI	RsaNI	RsaNI	TaaI	Bst4CI
FbaI	Ksp22I		Kzo9I	NspIII	Ama87I	RsrII	Rsr2I	Taq I	TaqI
FblI	FblI		BstKTI [^]	NspV	Bpu14I	Rsr2I	Rsr2I	TasI	Sse9I
FinI	BstFI	LweI	SfaNI	NspBII	MspAII	SacI	EcoICRI [^]	TelI	Tth111I
FnuDII	BspFNI	MabI	MabI	PaeI	SphI		Psp124BI	THI	Sfr274I
	BstFNI	MalI	MalI	Paer7I	Sfr274I	SacII	Sfr303I	Tru1I	Tru9I
Fnu4HI	Fsp4HI	MamI	Bse8I	Pall	BsuRI	Sall	Sall	Tru9I	Tru9I
FokI	FokI	MbiI	AccBSI		HaeIII	SapI	PciSI	Tsp509I	Sse9I
	BstF5I [^]	MboI	BstMBI	Paul	BsePI	SatI	Fsp4HI	Tsp4CI	Bst4CI
FriOI	FriOI		Kzo9I	PceI	PceI	SauI	Bse21I	TspEI	Sse9I
FseI	RigI		BstKTI [^]	PciI	PciI	Sau96I	AspS9I	Tth111I	Tth111I
FspI	Acc16I	MboII	MboII	PciSI	PciSI	Sau3AI	BstMBI	Van91I	AccB7I
Fsp4HI	Fsp4HI	McrI	BstMCI	PcsI	PcsI		Kzo9I	VneI	VneI
FunI	AfeI	MfeI	MfeI	PctI	PctI		BstKTI [^]	VpaK11BI	Bme18I
FunII	EcoRI	MflI	BstX2I	PdII	MroNI [^]	SbfI	SbfI	VspI	VspI
Gla I	Gla I	MhII	MhII	Pdml	MroXI	Scal	Zrml	XagI	BstENI
GluI	GluI	MlsI	Msp20I	PfI23II	PspLI	SchI	PpsI [^]	XapI	AcsI
GsaI	GsaI	MluI	MluI	PfIBI	AccB7I	ScrFI	BstSCI [^]	XbaI	XbaI
GsuI	BpmI	MluNI	Msp20I	PfIFI	Tth111I		MspR9I	XceI	BstNSI
HaeII	BstH2I	MlyI	PpsI [^]	PfIMI	AccB7I	SdaI	SbfI	XhoI	Sfr274I
HaeIII	BsuRI	Mly113I	EgeI [^]	PhoI	BsuRI	SduI	MhII	XhoII	BstX2I
	HaeIII		Mly113I		HaeIII	Secl	BssECI	XmaI	SmaI [^]
HapII	HpaII	MnlI	MnlI	PinAI	AsiGI	SetI	SetI		XmaI
	MspI	Mph1103I	Zsp2I	PleI	PpsI	SexAI	MabI	XmaIII	BseX3I
Hgal	Hgal	MroI	Bsp13I	Ple19I	Ple19I	SfaNI	SfaNI	XmaCI	SmaI [^]
HgiAI	Bbv12I	MroNI	MroNI	PmaCI	PspCI	SfcI	BstSFI		XmaI
HgiCI	AccB1I	MroXI	MroXI	PmlI	PspCI	Sfel	BstSFI	XmaJI	AspA2I
HgiJII	FriOI	MscI	Msp20I	PpsI	PpsI	SfiI	SfiI	XmiI	FblI
HhaI	AspLEI	MseI	Tru9I	PpuMI	PspPPI	SfoI	EgeI	XmnI	MroXI
	BstHHI	MslI	SmiMI	PpuXI	PspPPI		Mly113I [^]	ZhoI	Bsa29I
	HspAI [^]	MspI	HpaII	PshAI	BstPAI	Sfr274I	Sfr274I	Zral	AatII [^]
Hin1I	BstACI		MspI	PshBI	VspI	Sfr303I	Sfr303I		Zral
Hin6I	AspLEI [^]	Msp20I	Msp20I	PsiI	PsiI	Sful	Bpu14I	Zrml	Zrml
	BstHHI [^]	MspA1I	MspA1I	Psp5II	PspPPI	Sgfl	AsiSI	Zsp2I	Zsp2I
	HspAI	MspCI	BstAFI	Psp6I	AjnI		RgaI		
HinP1I	AspLEI [^]	MspR9I	BstSCI [^]		Bst2UI [^]	SgrBI	Sfr303I		
	BstHHI [^]		MspR9I		Psp6I	SinI	Bme18I		
	HspAI	MstI	Acc16I	Psp1406I	AcII	SlaI	Sfr274I		

Alphabetized List of SE Recognition Sequences

AA^CGTT	Acl I	C^CGG	Hpa II	GACN^NNGTC	Tth111 I
A^AGCTT	Hind III	C^CGG	Msp I	GACNN^NNGTC	BstPA I
(8/13)AAGN ₅ CTT(13/8)	Fal I	CC^NNGG	MspR9 I	GACNNN^NNGTC	Dri I
AAT^ATT	Ssp I	^CCNNGG	BstSC I	GACNNNN^NNGTC	DseD I
^AATT	Sse9 I	C^CNNGG	BssEC I	(8/13)GAC(N) ₆ TTYG(11/6)	Ars I
A^CATGT	Pci I	CCNNNNN^NNGG	Bsc4 I	(5/4)GACTC	Pps I
A^CCGGT	AsiG I	C^CRYGG	BstDS I	(5/1)GAGAC	BstMA I
ACCTGC(4/8)	Acc36 I	CC^SGG	AsuC2 I	(5/1)GAGACC	Bso31 I
A^CCWGGT	Mab I	C^CTAGG	AspA2 I	GAG^CGG	AccBS I
A^CGCGT	Mlu I	CCTC(7/6)	MnlI	GAG^CTC	EcoCR I
ACN^GT	Bst4C I	CC^TCGAGG	Abs I	GAGCT^C	Psp124B I
A^CTAGT	Ahl I	CCTGCA^GG	Sbf I	(6/7)GAGG	Mnl I
ACTGG(1/-1)	Bse1 I	CC^TNAGC	Bpu10 I	GAGTC(4/5)	Pps I
ACTGGG(5/4)	Bmu I	CC^TNAGG	Bse21 I	G^ANTC	Hinf I
A^GATCT	Bgl II	CCTNN^NNNAGG	BstEN I	GAT^ATC	EcoR V
AGC^GCT	Afe I	^CCWGG	Psp6 I	G(mA)^TC	Mal I
AG^CT	Alu I	CC^WGG	Bst2U I	^GATC	BstMB I
AG^ACT	AluB I	C^CWGGG	BstT1 I	^GATC	Kzo9 I
AGG^CCT	Pce I	C^CWGGG	Erh I	GAT^C	BstKTI
AGG^CGG	AccBS I	CGAT^CG	Ple19 I	(5/4)GATCC	AclW I
AGT^ACT	Zrm I	CG^CG	BspFN I	(9/5)GATGC	SfaN I
ASST^	Set I	CG^CG	BstFN I	GATNN^NNATC	Bse8 I
AT^CGAT	Bsa29 I	(5mC)G(5mC)^NG(5mC)G	GluI	GCAATG(2/0)	Bse3D I
ATGCA^T	Zsp2 I	C^GGCCG	BseX3 I	GCAGC(8/12)	BstV1 I
AT^TAAT	Vsp I	CG^GWCCG	Rsr2 I	(8/4)GCAGGT	Acc36 I
ATTT^AAAT	Smi I	CGRY^CG	BstMC I	GCANNNN^NTGC	BstAP I
C^AATTG	Mfe I	C^GTACG	PspL I	GCATC(5/9)	SfaN I
C^ACGAG	Bst2B I	CMG^CKG	MspA I	GCATG^C	Sph I
CAC^GTC	Btr I	(14/16)CTCCAG	Bpm I	(-1/1)GCATTC	Pct I
CAC^GTG	PspC I	C^TCGAG	Sfr274 I	G^CCGGC	MroN I
CACNNN^GTG	Dra III	C^TCGTG	Bst2B I	GCCNNNN^NGGC	Bgl I
CAG^CTG	Pvu II	CTCTTC(1/4)	Bst6 I	GCGAT^CGC	AsiS I
CAGNNN^CTG	PstN I	CTGAAG(16/14)	Acu I	GCGAT^CGC	Rga I
CA^TATG	FauND I	CTGCA^G	Pst I	G^CGC	HspA I
(13/9)CATCC	Fok I	CTGGAG(16/14)	Bpm I	GCG^C	AspLE I
(0/2)CATCC	BstF5 I	C^TNAG	BstDE I	GCG^C	BstHH I
CATG^	Fae I	C^TRYAG	BstSF I	G^CGCGC	BseP I
^CATG	Fat I	C^TTAAG	BstAF I	(-1/-3)GCGG	BspAC I
(0/2)CATTGC	Bse3D I	(14/16)CTTCAG	Acu I	GC^GGCCGC	CciN I
CAYNN^NNRTG	SmiM I	C^YCGRG	Ama87 I	(6/4)GCGGG	Fau I
(-1/1)CCAGT	Bse1 I	(7/12)GAAC(N) ₆ TAC(12/7)	Prs I	(10/5)GCGTC	Hga I
CCANNNN^NTGG	AccB7 I	GAAGAC(2/6)	BstV2 I	GC^NGC	Fsp4H I
CCANNNNN^NTGG	BstX I	(4/1)GAAGAG	Bst6 I	G^C(5mC)GGC	Kro I
C^CATGG	Bsp19 I	(4/1)GAAGAGC	PciS I	G(5mC)^ G(5mC)	Gla I
CCCAG^C	Gsa I	(7/12)GAAG(N) ₆ TAC(12/7)	Bar I	G(5mC)^NGC	Bis I
(4/5)CCCAGT	Bmu I	GAANN^NN TTC	MroX I	G(5mC)N^GC	Bls I
CCCGC(4/6)	Fau I	GAATGC(1/-1)	Pct I	GCN^NGC	BstC8 I
CCC^GGG	Sma I	G^AATTC	EcoR I	GCNNNNN^NNGC	BstMW I
C^CCGGG	Xma I	GACGC(5/10)	Hga I	G^CTAGC	AsuNH I
CCGC(-3/-1)	BspAC I	GACGT^C	Aat II	GCTAG^C	Bmt I
CCG^CCT	AccBS I	GAC^GTC	Zra I	GCTCTTC(1/4)	PciS I
CCGC^GG	Sfr303 I	GAC^GTG	Btr I	(12/8)GCTGC	BstV1 I

R = A or G

K = G or T

D = A or G or T

W = A or T

M = A or C

H = A or C or T

S = G or C

Y = T or C

V = A or C or G

B = C or G or T

N = A or C or G or T

Alphabetized List of SE Recognition Sequences

G [^] CTGGG	Gsa I	G [^] GTNACC	PspE I	R [^] GATCY	BstX2 I
GC [^] TNAGC	Bst1720 I	G [^] GWCC	Bme18 I	RGCGC [^] Y	BstH2 I
GC [^] TNAGG	Bpu10 I	G [^] GYRCC	AccB1 I	RG [^] GWCCY	PspPP I
GDGCH [^] C	Mhl I	GKGCM [^] C	BstSL I	TAC [^] GTA	BstSN I
GGATC(4/5)	AclW I	GR [^] CGYC	BstAC I	(7/8)TCACC	AsuHP I
G [^] GATCC	BamH I	GRG [^] CY [^] C	FriO I	T [^] CATGA	Cci I
GGATG(2/0)	BstF5 I	GT [^] AC	Rsa I	T [^] CCGGA	Bsp13 I
GGATG(9/13)	Fok I	G [^] TAC	RsaN I	T [^] CGA	Taq I
GG [^] CC	BsuR I	(7/12)GTA(N) ₆ CTTC(12/7)	Bar I	TCG [^] CGA	Nru I
GG [^] CC	Hae III	(7/12)GTA(N) ₆ GTTC(12/7)	Psr I	T [^] CTAGA	Xba I
GGCCGG [^] CC	Rig I	GTA [^] TAC	BssNA I	T [^] GATCA	Ksp22 I
GGCCNNNN [^] NGGCC	Sfi I	GTATCC(6/5)	Bsu I	TGC [^] GCA	Acc16 I
GG [^] CGCC	Mly113 I	(14/10)GTCCC	BslF I	TGG [^] CCA	Msp20 I
GGC [^] GCC	Ege I	G [^] TCGAC	Sal I	T [^] GTACA	BstAU I
GG [^] CGCGCC	PalA I	GTCTC(1/5)	BstMA I	T [^] TAA	Tru9 I
GGGAC(10/14)	BslF I	(6/2)GTCTTC	BstV2 I	TTA [^] TAA	Psi I
G [^] GGCCC	PspOM I	G [^] TGCAC	Vne I	TT [^] CGAA	Bpu14 I
GGGCC [^] C	Apa I	GT [^] MKAC	Fbl I	TTS [^] AA	Ags I
G [^] GNCC	AspS9 I	GTT [^] AAC	Hpa I	TTT [^] AAA	Dra I
GGN [^] NCC	PspN4 I	GTY [^] RAC	Hind II	VC [^] TCGAGB	PspX I
G [^] GTACC	Acc65 I	GWGCW [^] C	Bbv12 I	W(5mC)GNNNN [^] NNN(5mC)GW	Pcs I
GGTAC [^] C	Kpn I	R [^] AATTY	Acs I	YAC [^] GTR	BstBA I
GGTCTC(1/5)	Bso31 I	RCATG [^] Y	BstNS I	YA [^] TR	Fai I
GGTGA(8/7)	AsuHP I	R [^] CCGGY	Bse118 I	Y [^] GGCCR	Aco I

R = A or G

K = G or T

D = A or G or T

W = A or T

M = A or C

H = A or C or T

S = G or C

Y = T or C

V = A or C or G

B = C or G or T

N = A or C or G or T