

TECHNICAL BULLETIN

# pGEM<sup>®</sup>-7Zf(+) Vector

Instructions for Use of Product  
P2251



# pGEM<sup>®</sup>-7Zf(+)<sup>®</sup> Vector

All technical literature is available at: [www.promega.com/protocols/](http://www.promega.com/protocols/)  
 Visit the web site to verify that you are using the most current version of this Technical Bulletin.  
 E-mail Promega Technical Services if you have questions on use of this system: [techserv@promega.com](mailto:techserv@promega.com)

1. Description.....		1
2. Product Components and Storage Conditions .....		2
3. pGEM <sup>®</sup> -7Zf(+) <sup>®</sup> Vector Multiple Cloning Region and Circle Map .....		2
4. pGEM <sup>®</sup> -7Zf(+) <sup>®</sup> Vector Restriction Sites .....		4
5. Related Products.....		6

## 1. Description

The pGEM<sup>®</sup>-7Zf(+)<sup>®</sup> Vector is a derivative of the pGEM<sup>®</sup>-3Zf(+)<sup>®</sup> Vector. The plasmid serves as a standard cloning vector and as a template for in vitro transcription. The plasmid contains SP6 and T7 RNA polymerase promoters flanking a multiple cloning region within the  $\alpha$ -peptide coding region of  $\beta$ -galactosidase (1). Insertional inactivation of the  $\alpha$ -peptide allows recombinant clones to be directly identified by color screening on indicator plates. The multiple cloning region is unique and includes restriction sites for ApaI, AatII, SphI, XbaI, XhoI, EcoRI, KpnI, SmaI, Csp45I, ClaI, HindIII, BamHI, SacI, BstXI and NsiI. The polylinker contains restriction enzyme sites that produce 5' overhangs or blunt ends (sensitive to Exonuclease III) flanked on both sides by blocks of restriction sites that generate 3' overhangs (resistant to Exonuclease III).

The sequences of Promega vectors are available online at: [www.promega.com/vectors/](http://www.promega.com/vectors/) and from the GenBank<sup>®</sup> database.

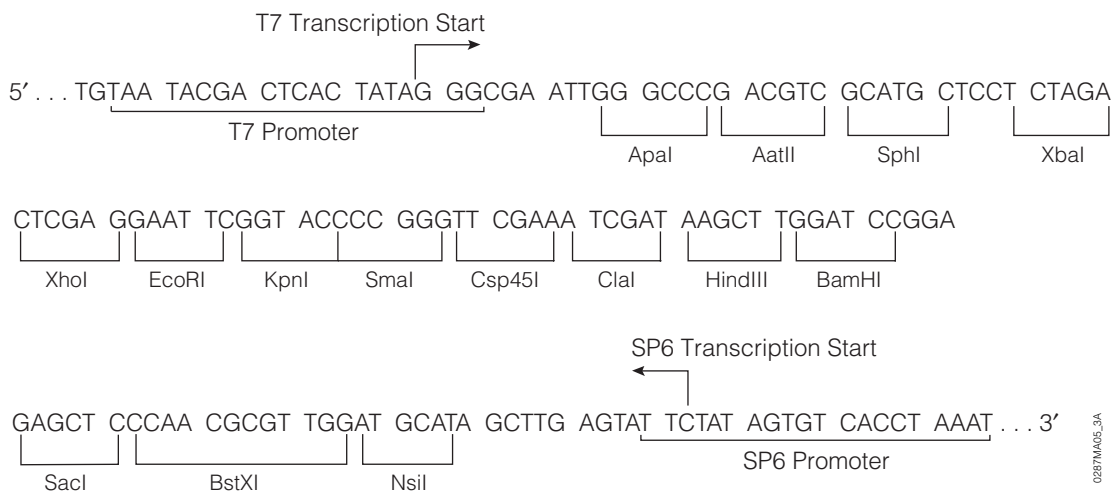
## 2. Product Components and Storage Conditions

PRODUCT	SIZE	CAT.#
pGEM <sup>®</sup> -7Zf(+) Vector	20µg	P2251

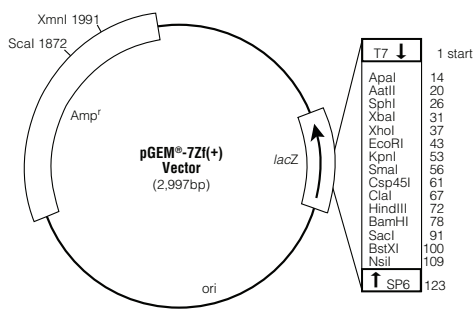
The pGEM<sup>®</sup>-7Zf(+) Vector is provided with a glycerol stock of bacterial strain JM109. The JM109 cells do not contain the vector and are not competent.

**Storage Conditions:** Store the pGEM<sup>®</sup>-7Zf(+) Vector at -20°C and the glycerol stock of JM109 cells at -70°C.

## 3. pGEM<sup>®</sup>-7Zf(+) Vector Multiple Cloning Region and Circle Map



**Figure 1. pGEM<sup>®</sup>-7Zf(+) Vector promoter and multiple cloning region sequence.** The sequence shown corresponds to RNA synthesized by T7 RNA polymerase and is complementary to RNA synthesized by SP6 RNA polymerase.



**Figure 2. pGEM®-7Zf(+) Vector circle map and sequence reference points.**

**pGEM®-7Zf(+) Vector sequence reference points:**

T7 RNA polymerase transcription initiation site	1
SP6 RNA polymerase transcription initiation site	123
T7 RNA polymerase promoter (-17 to +3)	2981-3
SP6 RNA polymerase promoter (-17 to +3)	121-140
multiple cloning region	10-110
<i>lacZ</i> start codon	162
<i>lac</i> operon sequences	2818-2978; 148-377
<i>lac</i> operator	182-198
$\beta$ -lactamase ( <i>Amp<sup>r</sup></i> ) coding region	1319-2179

**Specialized applications of the pGEM®-7Zf(+) Vector:**

- Blue/white screening for recombinants
- Transcription in vitro from dual-opposed promoters (For protocol information, please request the *Riboprobe® in vitro Transcription Systems Technical Manual*, #TM016.)
- Translation in vitro (For protocol information, please request the *TnT® Quick Coupled Transcription / Translation System Technical Manual*, #TM045.)

#### 4. pGEM<sup>®</sup>-7Zf(+) Vector Restriction Sites

The following restriction enzyme tables were constructed using DNASTAR<sup>®</sup> sequence analysis software. Please note that we have not verified this information by restriction digestion with each enzyme listed. The location given specifies the 3' end of the cut DNA (the base to the left of the cut site). For more information on the cut sites of these enzymes, or if you identify a discrepancy, please contact your local Promega Branch or Distributor. In the U.S., contact Promega Technical Services at 800-356-9526. The vector sequence is available in the GenBank<sup>®</sup> database (GenBank<sup>®</sup>/EMBL Accession Number X65310) and on the Internet at: [www.promega.com/vectors/](http://www.promega.com/vectors/)

**Table 1. Restriction Enzymes That Cut the pGEM<sup>®</sup>-7Zf(+) Vector Between 1 and 5 Times.**

Enzyme	# of Sites	Location	Enzyme	# of Sites	Location
AatII	1	20	BstOI	5	239, 527, 648, 661, 2934
AccIII	1	81	BstXI	1	100
Acc65I	1	49	Cfr101	2	1472, 2687
AcyI	2	17, 1929	ClaI	1	67
AflIII	2	96, 499	Csp451	1	61
Alw26I	2	1453, 2229	Ddel	4	774, 1183, 1349, 1889
Alw44I	2	813, 2059	DraI	3	1258, 1277, 1969, 2586
AlwNI	1	915	DraIII	1	2586
ApaI	1	14	DrdI	2	607, 2541
AspHI	4	91, 817, 1978, 2063	EaeI	3	338, 1780, 2967
AvaI	2	37, 54	EarI	3	383, 2187, 2875
AvaII	2	1530, 1752	EclHKI	1	1392
BamHI	1	78	EcoICRI	1	89
BanI	4	49, 243, 1340, 2623	EcoRI	1	43
BanII	3	14, 91, 2661	FokI	5	116, 1358, 1539, 1826, 2913
BbuI	1	26	FspI	2	1614, 2837
BglI	2	1512, 2830	HaeII	4	377, 747, 2737, 2745
BsaI	1	1453	Hgal	4	610, 1188, 1918, 2803
BsaAI	1	2586	HindIII	1	72
BsaHI	2	17, 1929	Hsp92I	2	17, 1929
BsaJI	5	53, 54, 238, 659, 2933	KpnI	1	53
BsaOI	5	415, 839, 1762, 1911, 2858	MaeI	5	32, 994, 1247, 1582, 2737
Bsp120I	1	10	MluI	1	96
BspHI	2	1219, 2227	MspA1I	5	323, 841, 1086, 2027, 2887
BssSI	2	672, 2056	NaeI	1	2689

#### 4. pGEM<sup>®</sup>-7Zf(+) Vector Restriction Sites (continued)

**Table 1. Restriction Enzymes That Cut the pGEM<sup>®</sup>-7Zf(+) Vector Between 1 and 5 Times (continued).**

Enzyme	# of Sites	Location	Enzyme	# of Sites	Location
NciI	5	55, 56, 879, 1575, 1926	ScaI	1	1872
NgoMIV	1	2687	SinI	2	1530, 1752
NsiI	1	109	SmaI	1	56
NspI	2	26, 503	SphI	1	26
PaeR7I	1	37	SspI	2	2196, 2378
Ppu10I	1	105	TfiI	2	334, 474
PspAI	1	54	VspI	3	270, 329, 1564
PvuI	2	1762, 2858	XbaI	1	31
PvuII	2	323, 2887	XhoI	1	37
RsaI	2	51, 1872	XmaI	1	54
SacI	1	91	XmnI	1	1991

**Table 2. Restriction Enzymes That Do Not Cut the pGEM<sup>®</sup>-7Zf(+) Vector.**

AccI	BsmI	Eco8II	PacI	SpeI
AccB7I	BspMI	EcoNI	PflMI	SplI
AflII	BsrGI	EcoRV	PinAI	SrfI
AgeI	BssHII	EheI	PmeI	Sse8387I
AscI	Bst1107I	FseI	PmII	StuI
AvrII	Bst98I	HincII	PpuMI	StyI
Ball	BstEII	HindII	PshAI	SwaI
BbeI	BstZI	HpaI	Psp5II	Tth111I
BbrPI	Bsu36I	I-PpoI	PstI	XcmI
BbsI	CspI	KasI	RsrII	
BclI	DraII	NarI	SacII	
BglII	DsaI	NcoI	SalI	
BlpI	EagI	NdeI	SfiI	
Bpu1102I	Eco47III	NheI	SgfI	
BsaBI	Eco52I	NotI	SgrAI	
BsaMI	Eco72I	NruI	SnaBI	

**Table 3. Restriction Enzymes That Cut the pGEM<sup>®</sup>-7Zf(+) Vector 6 or More Times.**

AclI	CfoI	HphI	MspI	SfaNI
AluI	DpnI	Hsp92II	NdeII	TaqI
BbvI	DpnII	MaeII	NlaIII	Tru9I
Bsp1286I	Fnu4HI	MaeIII	NlaIV	XhoII
BsrI	HaeIII	MboI	PleI	
BsrSI	HhaI	MboII	Sau3AI	
Bst71I	HinfI	MnI	Sau96I	
BstUI	HpaII	MseI	ScrFI	

## 5. Related Products

### pGEM<sup>®</sup> Vectors

Product	Size	Cat.#
pGEM <sup>®</sup> -3Z Vector	20µg	P2151
pGEM <sup>®</sup> -4Z Vector	20µg	P2161
pGEM <sup>®</sup> -3Zf(+) Vector	20µg	P2271
pGEM <sup>®</sup> -3Zf(-) Vector	20µg	P2261
pGEM <sup>®</sup> -5Zf(+) Vector	20µg	P2241
pGEM <sup>®</sup> -5Zf(-) Vector	20µg	P2351
pGEM <sup>®</sup> -7Zf(-) Vector	20µg	P2371
pGEM <sup>®</sup> -9Zf(-) Vector	20µg	P2391
pGEM <sup>®</sup> -11Zf(+) Vector	20µg	P2411
pGEM <sup>®</sup> -13Zf(+) Vector	20µg	P2541

All pGEM<sup>®</sup> Vectors are provided with a glycerol stock of bacterial strain JM109. The JM109 cells do not contain vector and are not competent.

### Other Vectors

<b>Product</b>	<b>Size</b>	<b>Cat.#</b>
pSP64 Poly(A) Vector	20µg	P1241
pSP72 Vector	20µg	P2191
pSP73 Vector	20µg	P2221

### Sequencing Primers

<b>Product</b>	<b>Size</b>	<b>Cat.#</b>
SP6 Promoter Primer	2µg	Q5011
T7 Promoter Primer	2µg	Q5021

### Related Systems

<b>Product</b>	<b>Cat.#</b>
Riboprobe® System—SP6	P1420
Riboprobe® System—T7	P1440
TnT® T7 Quick Coupled Transcription/Translation System	L1170
TnT® SP6 Quick Coupled Transcription/Translation System	L2080

© 1988–2006, 2017 Promega Corporation. All Rights Reserved.

Erase-a-Base, pGEM, Riboprobe and TnT are registered trademarks of Promega Corporation.

DNASTAR is a registered trademark of DNASTAR, Inc. GenBank is a registered trademark of the U.S. Department of Health and Human Services.

Products may be covered by pending or issued patents or may have certain limitations. Please visit our Web site for more information.

All prices and specifications are subject to change without prior notice.

Product claims are subject to change. Please contact Promega Technical Services or access the Promega online catalog for the most up-to-date information on Promega products.