

# 1 buffer. 176 restriction enzymes.

## FastDigest Restriction Enzymes

- 100% activity of all 176 FastDigest enzymes in the universal buffer
- Complete digestion in 5 minutes
- Direct loading of reaction mixture on gels



# Thermo Scientific FastDigest Restriction Enzymes

Thermo Scientific FastDigest enzymes are an advanced line of restriction enzymes for rapid DNA digestion. During our 30 years of restriction enzyme research, we compiled one of the largest collections of restriction enzyme producing bacterial strains in the industry. Our large selection of enzyme isoschomers and state-of-the-art production facility facilitated the creation of the unique system of 176 FastDigest restriction enzymes.

All FastDigest enzymes are 100% active in the universal FastDigest and FastDigest Green buffers and are able to digest DNA in 5-15 minutes. This enables any combination of restriction enzymes to work simultaneously in one reaction tube and eliminates the need for sequential digestions. As an added convenience, the FastDigest Green Buffer allows for direct loading of the reaction mixture on gels. FastDigest enzymes are qualified for complete digestion of plasmid DNA, genomic DNA, viral DNA and PCR products. Digestion time and protocols are experimentally proved and provided for each of the FastDigest enzyme on each of the templates.

Our FastDigest line of restriction enzymes is ideal for use in applications that require high purity reaction components, performance reliability and simple reaction set-up.

## Features

- 100% activity of all FastDigest enzymes in the universal reaction buffer
- Complete digestion in 5 - 15 minutes
- 100% buffer compatibility with downstream applications
- Direct loading on gels
- 176 FastDigest enzymes available
- Universal buffer optimized to eliminate star activity

## Applications

- Fast clone analysis
- Fast preparation of DNA for cloning
- Digestion of PCR products
- Fast RFLP genotyping
- Digestion of difficult-to-cleave DNA

## 100 % Buffer Compatibility with all downstream applications

Common DNA modifying enzymes are 100% active in FastDigest and FastDigest Green Buffer.

Therefore, enzymes used in downstream applications can be added directly to the restriction digestion reaction mixture eliminating the need for DNA purification steps.

DNA/RNA modifying enzyme	Activity in FastDigest Green Buffer/ FastDigest Buffer
DNA Polymerase I, <i>E.coli</i>	100%
Klenow Fragment	100%
Klenow Fragment, exo	100%
T7 DNA Polymerase	100%
T4 DNA Ligase*	75-100%
FastAP™ Thermosensitive Alkaline Phosphatase	100%
T4 Polynucleotide Kinase	100%

\* 0.5 mM ATP is required for T4 DNA Ligase activity.





# Set a new standard in DNA digestion

**FastDigest Enzymes - 100% Compatibility and Rapid DNA Digestion!**

	OLD STANDARD	NEW STANDARD
	Conventional restriction enzymes	FastDigest restriction enzymes
Buffer system	Up to 20 buffers	One universal buffer
Buffer change between enzymatic steps	Frequently necessary	Not necessary
Double/multiple restriction digestion	Limited due to buffer incompatibility	Unlimited - all 176 enzymes are 100% active in the universal buffer
Reaction time for plasmid DNA, genomic DNA, PCR product	1 hour - overnight	5 - 15 minutes
Direct loading of reaction mixture on gels	No	Yes
Compatibility with downstream applications	Partial	100%
Star activity	Dependent on enzyme properties and reaction conditions	No star activity due to short incubation time
Activity definition	1 unit of enzyme hydrolyzes 1 µg of lambda DNA in 60 minutes in an optimal buffer for an enzyme	1 µl of FastDigest enzyme cleaves 1 µg of substrate DNA in 5 or 15 minutes in FastDigest buffer



## Industry Leading Manufacturing Process

Production in Class D clean room facilities qualified and certified as per EU directives and ISPE guidelines

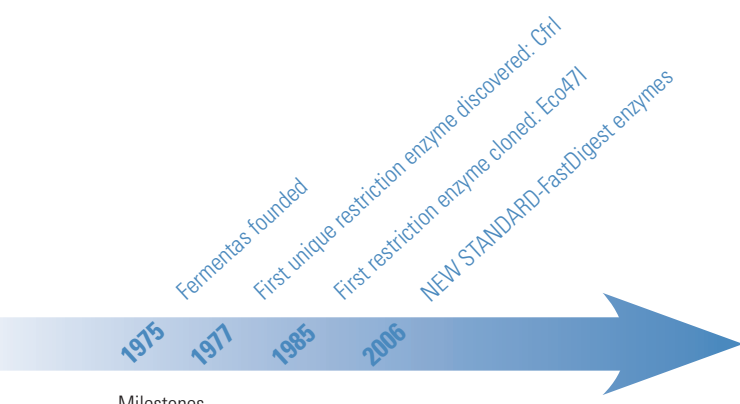
Stringent quality control

Consistency and lot-to-lot reproducibility assured by ISO9001 & ISO14001

ISO13845 for production of IVD products

cGMP production under request

## Over 35 years of experience in development of restriction enzymes



Milestones

Collection of >3000 restriction enzyme producing strains

Our scientists discovered >30% of all known restriction enzymes

>30% of all known restriction enzymes cloned

18 unique restriction enzymes available

176 FastDigest Enzymes available

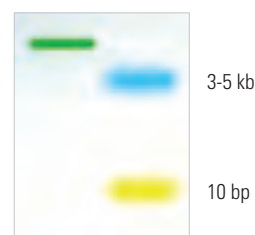
Supplied with FastDigest Green Buffer for direct loading on gels



# Universal buffer and direct loading on gels

All FastDigest restriction enzymes are 100% active in FastDigest Green Buffer. In addition to the buffer components, a density reagent and two tracking dyes are included for direct loading of digestion reaction products on gels. The blue dye migrates with 3-5 kb DNA fragments in a 1% agarose gel and has an excitation peak of 424 nm. The yellow dye migrates faster than 10 bp DNA fragments in a 1% agarose gel and has an excitation peak of 615 nm.

The FastDigest Green Buffer offers the same high performance in DNA digestion and downstream applications as the colorless FastDigest Buffer. For applications that require product analysis by fluorescence excitation (e.g. concentration measurements in UV light), we recommend using the colorless 10X FastDigest Buffer.



**FastDigest™  
Green Reaction Buffer**

**Double and multiple digestion  
in universal buffer for any  
combination of enzymes**

**Eliminate sequential digestions  
and buffer changes**

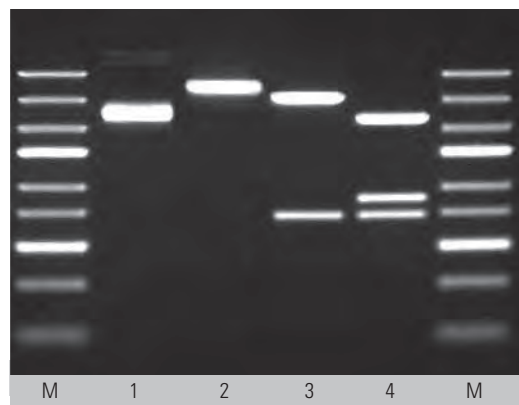
**Optimized buffer composition to  
eliminate star activity**

**Direct loading of reaction  
mixture on gels**

**Saves DNA loading reagents  
and pipetting time**

**Includes two tracking dyes and  
a density reagent**

**Five minute triple digestion in the  
FastDigest Green Reaction Buffer**



M: marker - Thermo Scientific GeneRuler Express Ladder #SM1553

- 1: plasmid - undigested control
- 2: plasmid - digested with FastDigest EcoRI
- 3: plasmid - double digested with FastDigest EcoRI and FastDigest KpnI
- 4: plasmid - triple digested with FastDigest EcoRI, FastDigest KpnI and FastDigest SmaI

# DNA Digestion in 5 minutes

Double and multiple digestion in one buffer in 5 - 15 minutes

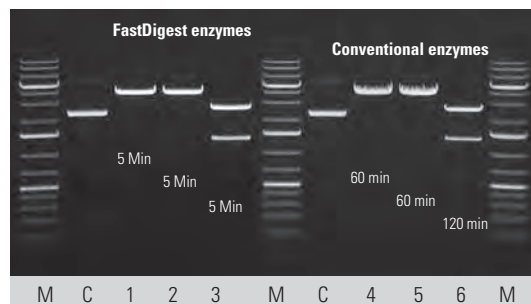
Ideal for high throughput applications

Digestion times are provided for all types of DNA templates: plasmid DNA, PCR product, genomic DNA

No overnight digestions are required for any template

No star activity - eliminates the need for prolonged incubation times

Digestion of plasmid DNA with FastDigest and conventional restriction enzymes.



M: GeneRuler™ 1 kb Plus DNA Ladder

C: Undigested plasmid DNA

1: Plasmid DNA digested in 5 min with FastDigest XhoI

2: Plasmid DNA digested in 5 min with FastDigest ApaI

3: Plasmid DNA double digested in 5 min with FastDigest XhoI and FastDigest ApaI

4: Plasmid DNA digested in 1 hour with ApaI

5: Plasmid DNA digested in 1 hour with XhoI

6: Plasmid DNA double digested in 1x Tango buffer with 4- fold excess of ApaI for 1 hour and then in 2x Tango buffer with XhoI for 1 more hour.

Save over 2 hours when performing double digestion reactions

## Conventional restriction enzymes

1	Reaction mixture for ApaI	~ 2 minutes
2	Incubation	60 minutes
3	Reaction mixture for XhoI	> 2 minutes
4	Incubation	60 minutes
5	Addition of Loading Dye	1 minute
<b>TOTAL TIME</b>		<b>&gt; 2 hours</b>

## FastDigest restriction enzymes

1	<b>ONE</b> reaction mixture with: FastDigest ApaI and FastDigest XhoI	<b>~2 minutes</b>
2	Incubation	<b>5 minutes</b>
<b>TOTAL TIME</b>		<b>7 minutes</b>



# Thermo Scientific FastDigest Restriction Enzymes

Cat. No.	Product name	React
FD0994	FastDigest <i>AatII</i>	50
FD1484	FastDigest <i>AccI</i> (XmII)	50
FD0904	FastDigest <i>Acc65I</i>	100
FD1794	FastDigest <i>AccI</i> (SsiI)	20
FD0944	FastDigest <i>AccI</i> (Psp1406I)	20
FD0344	FastDigest <i>Accu</i> (Eco57I)	20
FD0324	FastDigest <i>Atel</i> (Eco47III)	20
FD0834	FastDigest <i>AtIII</i> (Bsp7II)	150
FD1464	FastDigest <i>AgeI</i> (BshTI)	20
FD1954	FastDigest <i>AjuI</i>	20
FD1634	FastDigest <i>AleI</i> (OsiI)	20
FD0014	FastDigest <i>AluI</i>	100
FD0024	FastDigest <i>Alw21I</i>	100
FD0034	FastDigest <i>Alw26I</i>	100
FD1394	FastDigest <i>AlwNI</i> (CaiI)	50
FD1414	FastDigest <i>AlpI</i>	300
FD0044	FastDigest <i>AlpAI</i> (Alw44I)	200
FD1894	FastDigest <i>AscI</i> (SgsI)	100
FD0914	FastDigest <i>Asel</i> (VspI)	200
FD2094	FastDigest <i>AsiSI</i> (SfaAI)	100
FD0384	FastDigest <i>AvaI</i> (Eco88I)	200
FD0314	FastDigest <i>Avall</i> (Eco47I)	200
FD1564	FastDigest <i>AvrII</i> (XmaJI)	20
FD0054/5	FastDigest <i>BamHI</i>	800/2500
FD1004	FastDigest <i>BanI</i> (BshNI)	300
FD1014	FastDigest <i>BbsI</i> (BpiI)	20
FD2074	FastDigest <i>BbvI</i> (Lsp1109I)	100
FD0724	FastDigest <i>BclI</i>	300
FD1764	FastDigest <i>Bfal</i> (FspBI)	50
FD0074	FastDigest <i>BglI</i>	200
FD0083/4	FastDigest <i>BglII</i>	100/200
FD0094	FastDigest <i>BlnI</i> (Bpu1102I)	50
FD1444	FastDigest <i>BmeI</i> 1580I (BseSI)	50
FD2044	FastDigest <i>BmtI</i> (BspOI)	20
FD1314	FastDigest <i>BpmI</i>	20
FD0464	FastDigest <i>BpmI</i> (GsuI)	20
FD1184	FastDigest <i>Bpu10I</i>	20
FD1974	FastDigest <i>BsaAI</i> (Ppu21I)	50
FD1714	FastDigest <i>BsaBI</i> (BseJI)	200
FD0474	FastDigest <i>BsaHI</i> (Hin1I)	100
FD1084	FastDigest <i>BsaJI</i> (BseDI)	20
FD0874	FastDigest <i>BseGI</i>	100
FD0884	FastDigest <i>BseNI</i>	100
FD1454	FastDigest <i>BseXI</i>	20

Cat. No.	Product name	React
FD0924	FastDigest <i>Bsh1236I</i>	100
FD0894	FastDigest <i>BsiEI</i> (Bsh1285I)	100
FD0854	FastDigest <i>BsiWI</i> (Pfl23I)	50
FD1204	FastDigest <i>BsiI</i> (BseLI)	100
FD0454	FastDigest <i>BsmBI</i> (Esp3I)	20
FD1814	FastDigest <i>BsmFI</i> (FaqI)	20
FD0124	FastDigest <i>Bsp119I</i>	200
FD0134	FastDigest <i>Bsp120I</i>	200
FD0654	FastDigest <i>Bsp1286I</i> (SduI)	50
FD0933/4	FastDigest <i>Bsp1407I</i>	50/100
FD1404	FastDigest <i>BspCN</i> (BseMI)	20
FD1284	FastDigest <i>BspHI</i> (PagI)	50
FD1744	FastDigest <i>BspMI</i> (BveI)	50
FD1274	FastDigest <i>BsrBI</i> (MbiI)	100
FD1264	FastDigest <i>BsrDI</i> (BseMI)	20
FD0184	FastDigest <i>BsrFI</i> (Cfr10I)	50
FD2134	FastDigest <i>BssHI</i> (PteI)	20
FD1024	FastDigest <i>BstXI</i>	100
FD0704	FastDigest <i>BstZ17I</i> (Bst1107I)	100
FD0374	FastDigest <i>Bsu36I</i> (Eco811I)	50
FD0143/4	FastDigest <i>ClaI</i> (Bsu15I)	50/100
FD0214	FastDigest <i>Csp6I</i>	100
FD1884	FastDigest <i>DdeI</i> (HpyF3I)	50
FD1703/4	FastDigest <i>DpnI</i>	50/100
FD0224	FastDigest <i>DraI</i>	200
FD1234	FastDigest <i>DraIII</i> (AdelI)	50
FD1724	FastDigest <i>DrrII</i> (AasI)	25
FD0334	FastDigest <i>EagI</i> (Eco52I)	50
FD0244	FastDigest <i>Eam1105I</i>	100
FD0234	FastDigest <i>EarI</i> (Eam1104I)	50
FD0254	FastDigest <i>Ecl136I</i>	100
FD0293/4	FastDigest <i>Eco31I</i>	50/100
FD0394	FastDigest <i>Eco91I</i>	200
FD1304	FastDigest <i>EcoNI</i> (XagI)	100
FD0264	FastDigest <i>EcoO109I</i>	200
FD0274/5	FastDigest <i>EcoRI</i>	800/2500
FD0303/4	FastDigest <i>EcoRV</i> (Eco32I)	200/400
FD0443/4	FastDigest <i>EheI</i>	20/50
FD1644	FastDigest <i>Fnu4HI</i> (SatfX)	20
FD2144	FastDigest <i>FokI</i>	100
FD1224	FastDigest <i>FspI</i> (NsbI)	50
FD1664	FastDigest <i>FspAI</i>	20
FD2184	FastDigest <i>HaellI</i> (BfoI)	200
FD0154	FastDigest <i>HaellII</i> (BsuRI)	400

Cat. No.	Product name	React
FD1904	FastDigest <i>HgaI</i> (CseI)	20
FD1854	FastDigest <i>HhaI</i>	200
FD0494	FastDigest <i>HincII</i>	100
FD0504/5	FastDigest <i>HindIII</i>	800/2500
FD0804	FastDigest <i>HinII</i>	400
FD0484	FastDigest <i>HinP1I</i> (Hin6I)	200
FD1034	FastDigest <i>HpaI</i> (KspAI)	50
FD0514	FastDigest <i>HpaII</i>	200
FD1574	FastDigest <i>Hpy8I</i>	20
FD1734	FastDigest <i>HpyF10VI</i>	20
FD0524	FastDigest <i>KpnI</i>	300
FD0534	FastDigest <i>Kpn2I</i>	100
FD2084	FastDigest <i>MauBI</i>	20
FD0814	FastDigest <i>MbcI</i>	50
FD0824	FastDigest <i>MbcII</i>	50
FD0753/4	FastDigest <i>MfeI</i> (MunI)	20/50
FD0564	FastDigest <i>MluI</i>	100
FD1374	FastDigest <i>MlyI</i> (SchI)	100
FD1074	FastDigest <i>MnlI</i>	50
FD2024	FastDigest <i>MreI</i>	20
FD1214	FastDigest <i>MscI</i> (MlsI)	50
FD2174	FastDigest <i>MseI</i> (SagAI)	50
FD2004	FastDigest <i>MslI</i> (RseI)	20
FD0544	FastDigest <i>MspI</i>	400
FD1344	FastDigest <i>MssI</i>	100
FD0554	FastDigest <i>MvaI</i>	200
FD0964	FastDigest <i>Mva1269I</i>	50
FD1524	FastDigest <i>NaeI</i> (PdiI)	50
FD0064	FastDigest <i>NcoI</i> (BcnI)	200
FD0573/4/5	FastDigest <i>NcoII</i>	20/100/300
FD0583/4/5	FastDigest <i>NdeI</i>	100/300/1000
FD0973/4	FastDigest <i>NheI</i>	50/100
FD1834	FastDigest <i>NlaIII</i> (Hin1II)	100
FD1154	FastDigest <i>NlaIV</i> (BspLI)	20
FD1514	FastDigest <i>NmuCI</i>	20
FD0593/4/6	FastDigest <i>NotI</i>	20/50/250
FD2154	FastDigest <i>NruI</i> (RruI)	100
FD0734	FastDigest <i>NsiI</i> (Mph1103I)	100
FD1474	FastDigest <i>NspI</i> (XceI)	50
FD2204	FastDigest <i>Pacl</i>	25
FD1534	FastDigest <i>PdmI</i>	100
FD0714	FastDigest <i>PflMI</i> (Man91I)	100
FD1754	FastDigest <i>PfoI</i>	20
FD0364	FastDigest <i>PmlI</i> (Eco72I)	200

Cat. No.	Product name	React
FD0764	FastDigest <i>PpuMI</i> (Psp5II)	50
FD1434	FastDigest <i>PshAI</i> (BoxI)	100
FD2064	FastDigest <i>PsiI</i> (AanI)	20
FD2224	FastDigest <i>PspFI</i>	20
FD0614/5	FastDigest <i>PstI</i>	800/2500
FD1554	FastDigest <i>PsuI</i>	150
FD1334	FastDigest <i>PsyI</i>	100
FD0624	FastDigest <i>PvuI</i>	20
FD0634	FastDigest <i>PvuII</i>	400
FD1124	FastDigest <i>RsaI</i>	100
FD0744	FastDigest <i>RsrII</i> (CpoI)	20
FD1133/4	FastDigest <i>SacI</i>	100/200
FD0644	FastDigest <i>SacII</i>	200
FD2164	FastDigest <i>SanDI</i> (KliI)	20
FD1934	FastDigest <i>SapI</i> (LguI)	20
FD0784	FastDigest <i>Sau3AI</i> (Bsp143I)	40
FD0194	FastDigest <i>Sau96I</i> (Cfr13I)	100
FD1194	FastDigest <i>SbfI</i> (SdaI)	20
FD0434	FastDigest <i>Scal</i>	100
FD1424	FastDigest <i>ScrFI</i> (Bme1390I)	100
FD2114	FastDigest <i>SexAI</i> (CsiI)	50
FD2124	FastDigest <i>SfaNI</i> (BmsI)	20
FD1164	FastDigest <i>SfiCI</i> (BimI)	20
FD1824	FastDigest <i>SfiI</i>	150
FD0663/4	FastDigest <i>SmaI</i>	100/200
FD0404	FastDigest <i>SnaBI</i> (Eco105I)	50
FD1253/4	FastDigest <i>SpeI</i> (BouI)	20/50
FD0604	FastDigest <i>SphI</i> (PaeI)	20
FD0774	FastDigest <i>SspI</i>	100
FD0424	FastDigest <i>StuI</i> (Eco147I)	100
FD0414	FastDigest <i>StyI</i> (Eco130I)	200
FD1244	FastDigest <i>SwaI</i> (SmiI)	200
FD1364	FastDigest <i>TaaI</i>	20
FD1144	FastDigest <i>TalI</i>	50
FD0674	FastDigest <i>TaqI</i>	400
FD1294	FastDigest <i>TatI</i>	20
FD1654	FastDigest <i>TauI</i>	20
FD1784	FastDigest <i>TliI</i> (PfeI)	50
FD0984	FastDigest <i>TruII</i>	50
FD1354	FastDigest <i>Tsp509I</i> (TasI)	100
FD2104	FastDigest <i>TspRI</i> (TscAI)	100
FD1383/4	FastDigest <i>XapI</i>	50/100
FD0684/5	FastDigest <i>XbaI</i>	300/750
FD0694/5	FastDigest <i>XhoI</i>	400/1200

• For further information visit:  
[thermoscientific.com/fastdigest](http://thermoscientific.com/fastdigest)

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