Thermo SCIENTIFIC

PRODUCT INFORMATION

TaqI

#ER0671 3000 U

Lot: ___ **Expiry Date: _**

5'...**T↓C G A**...3'
3'...**A G C↑T**...5'

Concentration:	10 U/µL
Source:	*Thermus aquaticus* YT-1
Supplied with:	2x1 mL of 10X Buffer TaqI 1 mL of 10X Buffer Tango

Store at -20°C

In total 4 vials. BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer TaqI (for 100% TaqI digestion)
10 mM Tris-HCl (pH 8.0), 5 mM $MgCl_2$, 100 mM NaCl, 0.1 mg/mL BSA.

Incubation temperature
65°C*****.

Unit Definition
One unit is defined as the amount of TaqI required to digest 1 µg of lambda DNA *dam*⁻ in 1 hour at 65°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

***** Incubate under paraffin oil in a capped vial. Incubation at 37°C results in 10% activity.

Rev.11

Storage Buffer

TaqI is supplied in: 10 mM Tris-HCl (pH 7.5 at 25°C), 300 mM KCl, 1 mM DTT, 0.1 mM EDTA, 0.5 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer TaqI	2 µL
DNA (0.5-1 µg/µL)	1 µL
TaqI	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate under paraffin oil in a capped vial at 65°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL (~0.1-0.5 µg of DNA)
nuclease-free water	18 µL
10X Buffer TaqI	2 µL
TaqI	1-2 µL

- Mix gently and spin down for a few seconds.
- Incubate under paraffin oil in a capped vial at 65°C for 1-16 hours.

Thermal Inactivation

TaqI is not inactivated by incubation at 80°C for 20 min.

Inactivation Procedure

- To prepare the digested DNA for electrophoresis:
  – stop the digestion reaction by adding 0.5 M EDTA, pH 8.0 (#R1021), to achieve a 20mM final concentration. Mix thoroughly, add an electrophoresis loading dye and load onto gel.
- To prepare DNA suitable for further enzymatic reactions:
  – extract with phenol/chloroform, precipitate with ethanol or isopropanol, wash the pellet with 75% cold ethanol and air-dry;
  – dissolve DNA in either nuclease-free water, TE buffer, or a buffer suitable for further applications;
  – check the DNA concentration in the solution.

For **ENZYME PROPERTIES** and **CERTIFICATE OF ANALYSIS**
see back page

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

TaqI	B	G	O	R	Tango	2X Tango
100	0-20	20-50	20-50	20-50	20-50	20-50

Methylation Effects on Digestion

Dam: may overlap – blocked.
Dcm: never overlaps – no effect.
CpG: completely overlaps – no effect.
EcoKI: never overlaps – no effect.
EcoBI: never overlaps – no effect.

Stability during Prolonged Incubation

A minimum of 0.3 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 65°C.

Compatible Ends

Bsp119I, Bsu15I, Hin1I, Hin6I, HpaII, MaeII, MspI, NarI, Psp1406I, SsiI, XmiI.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
121	10	7	4	4	5	12

Note

TaqI is blocked by overlapping *dam* methylation. To avoid *dam* methylation, use a *dam*$^-$, *dcm*$^-$ strain such as GM2163 (#M0099).

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with TaqI (10 U/µg lambda DNA *dam*$^-$ × 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of TaqI for 4 hours.

Quality authorized by:  Jurgita Zilinskiene

Thermo SCIENTIFIC

PRODUCT INFORMATION

BseNI (BsrI)

#ER0881 1000 U

Lot: ___ **Expiry Date: _**

5'... **A C T G G N**↓...3'
3'... **T G A C**↑**C N** ...5'

Concentration:	10 U/µL
Source:	*Bacillus species* N
Supplied with:	1 mL of 10X Buffer B
	1 mL of 10X Buffer Tango

Store at -20°C

In total 3 vials. BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer B (for 100% BseNI digestion)
10 mM Tris-HCl (pH 7.5), 10 mM $MgCl_2$, 0.1 mg/mL BSA.

Incubation temperature
65°C*****.

Unit Definition
One unit is defined as the amount of BseNI required to digest 1 µg of lambda DNA in 1 hour at 65°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

***** Incubation at 37°C results in less than 10% activity.

Storage Buffer

BseNI is supplied in: 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer B	2 µL
BseNI	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 65°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL (~0.1-0.5 µg of DNA)
nuclease-free water	18 µL
10X Buffer B	2 µL
BseNI	1-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 65°C for 1-16 hours.

Thermal Inactivation

BseNI is inactivated by incubation at 80°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
100	20-50	0-20	0-20	50-100	20-50

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: never overlaps – no effect.
CpG: never overlaps – no effect.
EcoKI: may overlap – effect not determined.
EcoBI: may overlap – effect not determined.

Stability during Prolonged Incubation

A minimum of 0.1 units of the enzyme is required for complete digestion of 1 µg of DNA in 16 hours at 65°C.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
110	9	19	11	11	12	18

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with BseNI (10 U/µg lambda DNA x 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of BseNI for 4 hours.

Quality authorized by:  Jurgita Zilinskiene

PRODUCT USE LIMITATION

This product is developed, designed and sold exclusively *for research purposes and in vitro use only.* The product was not tested for use in diagnostics or for drug development, nor is it suitable for administration to humans or animals.

Please refer to www.thermoscientific.com/onebio for Material Safety Data Sheet of the product.

Thermo SCIENTIFIC

PRODUCT INFORMATION

Eco32I (EcoRV)

#ER0301 2000 U

Lot: ___ **Expiry Date: _**

5'...**G A T↓A T C**...3'
3'...**C T A↑T A G**...5'

Concentration:	10 U/µL
Source:	*Escherichia coli* RFL32
Supplied with:	1 mL of 10X Buffer R
	1 mL of 10X Buffer Tango

Store at -20°C

In total 3 vials. BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer R (for 100% Eco32I digestion)
10 mM Tris-HCl (pH 8.5), 10 mM $MgCl_2$, 100 mM KCl, 0.1 mg/mL BSA.

Incubate at 37°C.

Unit Definition

One unit is defined as the amount of Eco32I required to digest 1 µg lambda DNA in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution

Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests

Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Rev.9

Storage Buffer

Eco32I is supplied in: 25 mM Tris-HCl (pH 7.5 at 25°C), 200 mM NaCl, 1 mM DTT, 1 mM EDTA, 0.2 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer R	2 µL
DNA (0.5-1 µg/µL)	1 µL
Eco32I	0.5-2 µL*

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL (~0.1-0.5 µg of DNA)
nuclease-free water	18 µL
10X Buffer R	2 µL
Eco32I	1-2 µL*

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

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* This volume of the enzyme is recommended for preparations of standard concentrations (10 U/µL), whereas HC enzymes (50 U/µL) should be diluted with Dilution Buffer to obtain 10 U/µL concentration.

Thermal Inactivation

Eco32I is inactivated by incubation at 80°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
0-20	50-100	50-100	**100**	20-50	100

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: never overlaps – no effect.
CpG: may overlap – no effect.
EcoKI: never overlaps – no effect.
EcoBI: may overlap – effect not determined.

Stability during Prolonged Incubation

A minimum of 0.1 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 37°C.

Digestion of Agarose-embedded DNA

A minimum of 5 units of the enzyme is required for complete digestion of 1 µg of agarose-embedded lambda DNA in 16 hours.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
21	0	1	1	0	0	0

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with Eco32I (10 U/µg lambda DNA × 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of Eco32I for 4 hours.

Blue/White (B/W) Cloning Assay

The B/W assay was replaced with LO test after validating experiments showed LO test ability to detect nuclease and phosphatase activities with sensitivity that equals to that of B/W test.

Quality authorized by:  Jurgita Zilinskiene

PRODUCT USE LIMITATION

This product is developed, designed and sold exclusively *for research purposes and in vitro use only.* The product was not tested for use in diagnostics or for drug development, nor is it suitable for administration to humans or animals.

Please refer to www.thermoscientific.com/onebio for Material Safety Data Sheet of the product.

Thermo SCIENTIFIC

PRODUCT INFORMATION

MvaI (BstNI)

#ER0551 2000

Lot: ___ **Expiry Date: _**

5'...**C C↓W G G**...3'
3'...**G G W↑C C**...5'

Concentration: 10 U/µL
Source: *E.coli* that carries the cloned *mvalR* gene from *Micrococcus varians* RFL19
Supplied with: 1 mL of 10X Buffer R
1 mL of 10X Buffer Tango

Store at -20°C

In total 3 vials. BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer R (for 100% MvaI digestion)
10 mM Tris-HCl (pH 8.5), 10 mM $MgCl_2$, 100 mM KCl, 0.1 mg/mL BSA.

Incubation temperature
37°C.

Unit Definition
One unit is defined as the amount of MvaI required to digest 1 µg lambda DNA in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Rev.12

Storage Buffer

MvaI is supplied in: 10 mM Tris-HCl (pH 7.4 at 25°C), 400 mM KCl, 1 mM DTT, 0.1 mM EDTA, 0.2 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer R	2 µL
DNA (0.5-1 µg/µL)	1 µL
MvaI	0.5-2 µL*****

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours*****.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL (~0.1-0.5 µg of DNA)
nuclease-free water	18 µL
10X Buffer R	2 µL
MvaI	1-2 µL*****

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours*****.

***** *See* Overdigestion Assay on back page.

Thermal Inactivation

MvaI is not inactivated by incubation at 80°C for 20 min.

Inactivation Procedure

- To prepare the digested DNA for electrophoresis:
  – stop the digestion reaction by adding 0.5 M EDTA, pH 8.0 (#R1021), to achieve a 20 mM final concentration. Mix thoroughly, add an electrophoresis loading dye and load onto gel.
- To prepare DNA suitable for further enzymatic reactions:
  – extract with phenol/chloroform, precipitate with ethanol or isopropanol, wash the pellet with 75% cold ethanol and air-dry;
  – dissolve DNA in either nuclease-free water, TE buffer, or a buffer suitable for further applications;
  – check the DNA concentration in the solution.

For **ENZYME PROPERTIES** and **CERTIFICATE OF ANALYSIS** *see* back page

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
20-50	20-50	50-100	**100**	20-50**	100

**Star activity appears at a greater than 5-fold overdigestion (5 U × 1 h).

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: completely overlaps – no effect.
CpG: never overlaps – no effect.
EcoKI: never overlaps – no effect.
EcoBI: never overlaps – no effect.

Stability during Prolonged Incubation

A minimum of 0.1 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 37°C.

Compatible Ends

SatI, Bme1390I

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
71	2	6	5	5	5	7

Note

Unlike its neoschizomer EcoRII, MvaI does not require multiple copies of recognition site for efficient cleavage.

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 80-fold overdigestion with MvaI (5 U/µg lambda DNA × 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of MvaI for 4 hours.

Quality authorized by:  Jurgita Zilinskiene

Thermo SCIENTIFIC

PRODUCT INFORMATION

HincII (HindII)

#ER0492 2500 U

Lot: ___ **Expiry Date: _**

5'...**G T Y↓R A C**...3'
3'...**C A R↑Y T G**...5'

Concentration: 10 U/µL
Supplied with: 1 mL of 10X Buffer Tango

Store at -20°C

BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Thermo Scientific Tango Buffer (for 100% HincII digestion)
33 mM Tris-acetate (pH 7.9), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Incubation temperature
37°C.

Unit Definition
One unit is defined as the amount of HincII required to digest 1 µg of lambda DNA in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Tango™ Buffer provided simplifies buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango Buffer. Please go to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.

Storage Buffer
HincII is supplied in: 10 mM Tris-HCl (pH 7.5 at 25°C), 200 mM KCl, 1 mM DTT, 0.1 mM EDTA, 0.5 mg/mL BSA and 50% glycerol.

Rev.10

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer Tango	2 µL
DNA (0.5-1 µg/µL)	1 µL
HincII	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL	(~0.1-0.5 µg of DNA)
nuclease-free water	18 µL	
10X Buffer Tango	2 µL	
HincII	1-2 µL	

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

Thermal Inactivation

HincII is inactivated by incubation at 65°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
50-100	50-100	20-50	50-100	**100**	50-100

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: never overlaps – no effect.
CpG: may overlap – cleavage impaired.
EcoKI: may overlap – blocked.
EcoBI: may overlap – blocked.

Stability during Prolonged Incubation

A minimum of 0.1 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 37°C.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
35	13	2	1	1	1	1

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with HincII (10 U/µg lambda DNA × 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of HincII for 4 hours.

Quality authorized by:  Jurgita Zilinskiene

Thermo SCIENTIFIC

PRODUCT INFORMATION

MnlI

#ER1072 1500 U

Lot: ___ **Expiry Date: _**

5'...**C C T C (N)$_7$**↓...3'
3'...**G G A G (N)$_6$**↑...5'

Concentration: 10 U/µL
Source: *E.coli* that carries the cloned *mnlIR* gene from *Moraxella nonliquefaciens*
Supplied with: 1 mL of 10X Buffer G
1 mL of 10X Buffer Tango

Store at -20°C

BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer G (for 100% MnlI digestion)
10 mM Tris-HCl (pH 7.5), 10 mM $MgCl_2$, 50 mM NaCl, 0.1 mg/mL BSA.

Incubation temperature
37°C.

Unit Definition
One unit is defined as the amount of MnlI required to digest 1 µg of lambda DNA in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C) 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Storage Buffer

MnlI is supplied in: 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer G	2 µL
DNA (0.5-1 µg/µL)	1 µL
MnlI	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL	(~0.1-0.5 µg of DNA)
nuclease-free water	18 µL	
10X Buffer G	2 µL	
MnlI	1-2 µL	

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

Thermal Inactivation

MnlI is inactivated by incubation at 65°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
50-100	**100**	20-50	20-50	20-50	20-50

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: never overlaps – no effect.
CpG: may overlap – no effect.
EcoKI: never overlaps – no effect.
EcoBI: may overlap – blocked.

Stability during Prolonged Incubation

A minimum of 0.5 units of the enzyme is required for complete digestion of 1 µg of DNA in 16 hours at 37°C.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
262	34	26	14	13	12	61

Note

- MnlI produces DNA fragments that have a single-base 3'-extension which are more difficult to ligate than blunt-ended fragments.
- MnlI may remain associated with the cleaved DNA. This may cause DNA band shifting during electrophoresis. To avoid atypical DNA band patterns, use the 6X DNA Loading Dye&SDS Solution (#R1151) for sample preparation or heat the digested DNA in the presence of SDS prior to electrophoresis.

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with MnlI (10 U/µg lambda DNA x 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of MnlI for 4 hours.

Quality authorized by:  Jurgita Zilinskiene

Thermo SCIENTIFIC

PRODUCT INFORMATION

Eco88I (AvaI)

#ER0381 1000 U

Lot: ___ **Expiry Date: _**

5'...**C↓Y C G R G**...3'
3'...**G R G C Y↑C**...5'

Concentration: 10 U/µL
Source: *E.coli* that carries the cloned *eco88IR* gene from *E.coli* RFL88
Supplied with: 1 mL of 10X Buffer Tango

Store at -20°C

BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Thermo Scientific Tango Buffer (for 100% Eco88I digestion)
33 mM Tris-acetate (pH 7.9), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Incubation temperature
37°C.

Unit Definition
One unit is defined as the amount of Eco88I required to digest 1 µg of lambda DNA in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Tango™ Buffer provided simplifies buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango Buffer. Please go to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.

Storage Buffer
Eco88I is supplied in: 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Rev.11

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer Tango	2 µL
DNA (0.5-1 µg/µL)	1 µL
Eco88I	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL	(~0.1-0.5 µg of DNA)
nuclease-free water	18 µL	
10X Buffer Tango	2 µL	
Eco88I	1-2 µL	

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

Thermal Inactivation

Eco88I is inactivated by incubation at 65°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
100	50-100	0-20	0-20	**100**	20-50

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: never overlaps – no effect.
CpG: completely overlaps – cleavage impaired.
EcoKI: never overlaps – no effect.
EcoBI: never overlaps – no effect.

Stability during Prolonged Incubation

A minimum of 0.2 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 37°C.

Digestion of Agarose-embedded DNA

A minimum of 5 units of the enzyme is required for complete digestion of 1 µg of agarose-embedded lambda DNA in 16 hours.

Compatible Ends

C↓CCGGG - BshTI, BsaWI, Cfr9I, Cfr10I, Kpn2I, MreI, NgoMIV, SgrAI
C↓TCGAG - SalI, SgrDI, SmoI, XhoI

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
8	1	1	1	1	1	2

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is after a 160-fold overdigestion with Eco88I (10 U/µg lambda DNA × 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of Eco88I for 4 hours.

Blue/White (B/W) Cloning Assay

The B/W assay was replaced with LO test after validating experiments showed LO test ability to detect nuclease and phosphatase activities with sensitivity that equals to that of B/W test.

Quality authorized by:  Jurgita Zilinskiene

PRODUCT USE LIMITATION

This product is developed, designed and sold exclusively *for research purposes and in vitro use only.* The product was not tested for use in diagnostics or for drug development, nor is it suitable for administration to humans or animals.

Please refer to www.thermoscientific.com/onebio for Material Safety Data Sheet of the product.

Thermo SCIENTIFIC

PRODUCT INFORMATION

MlsI (MscI)

#ER1212 1000 U

Lot: ___ **Expiry Date: _**

5'...**T G G↓C C A**...3'
3'...**A C C↑G G T**...5'

Concentration: 5 U/µL
Source: *Micrococcus luteus* Ng 16-122
Supplied with: 1 mL of 10X Buffer R
1 mL of 10X Buffer Tango

Store at -20°C

BSA included

www.thermoscientific.com/onebio

RECOMMENDATIONS

1X Buffer R (for 100% MlsI digestion)
10 mM Tris-HCl (pH 8.5), 10 mM $MgCl_2$, 100 mM KCl, 0.1 mg/mL BSA.

Incubation temperature
37°C.

Unit Definition
One unit is defined as the amount of MlsI required to digest 1 µg of lambda DNA *dcm*⁻ in 1 hour at 37°C in 50 µL of recommended reaction buffer.

Dilution
Dilute with the Dilution Buffer (#B19): 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM EDTA, 1 mM DTT, 0.2 mg/mL BSA and 50% glycerol.

Double Digests
Thermo Scientific Tango Buffer is provided to simplify buffer selection for double digests. 98% of Thermo Scientific restriction enzymes are active in a 1X or 2X concentration of Tango™ Buffer. Please refer to www.thermoscientific.com/doubledigest to choose the best buffer for your experiments.
1X Tango Buffer: 33 mM Tris-acetate (pH 7.9 at 37°C), 10 mM magnesium acetate, 66 mM potassium acetate, 0.1 mg/mL BSA.

Storage Buffer

MlsI is supplied in: 10 mM Tris-HCl (pH 7.4 at 25°C), 100 mM KCl, 1 mM DTT, 1 mM EDTA, 0.2 mg/mL BSA and 50% glycerol.

Recommended Protocol for Digestion

- Add:

nuclease-free water	16 µL
10X Buffer R	2 µL
DNA (0.5-1 µg/µL)	1 µL
MlsI	0.5-2 µL

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-2 hours.

The digestion reaction may be scaled either up or down.

Recommended Protocol for Digestion of PCR Products Directly after Amplification

- Add:

PCR reaction mixture	10 µL	(~0.1-0.5 µg of DNA)
nuclease-free water	18 µL	
10X Buffer R	2 µL	
MlsI	1-2 µL	

- Mix gently and spin down for a few seconds.
- Incubate at 37°C for 1-16 hours.

Thermal Inactivation

MlsI is inactivated by incubation at 65°C for 20 min.

ENZYME PROPERTIES

Enzyme Activity in Thermo Scientific REase Buffers, %

B	G	O	R	Tango	2X Tango
0-20	20-50	0-20	**100**	20-50	50-100

Methylation Effects on Digestion

Dam: never overlaps – no effect.
Dcm: may overlap – blocked.
CpG: never overlaps – no effect.
EcoKI: never overlaps – no effect.
EcoBI: never overlaps – no effect.

Stability during Prolonged Incubation

A minimum of 0.5 units of the enzyme is required for complete digestion of 1 µg of lambda DNA in 16 hours at 37°C.

Digestion of Agarose-embedded DNA

A minimum of 20 units of the enzyme is required for complete digestion of 1 µg of agarose-embedded lambda DNA in 16 hours.

Number of Recognition Sites in DNA

λ	ΦX174	pBR322	pUC57	pUC18/19	pTZ19R/U	M13mp18/19
18	0	1	0	0	0	1

Note

MlsI is blocked by overlapping *dcm* methylation. To avoid *dcm* methylation, use a *dam*$^-$, *dcm*$^-$ strain such as GM2163 (#M0099).

For **CERTIFICATE OF ANALYSIS** *see* back page

CERTIFICATE OF ANALYSIS

Overdigestion Assay

No detectable change in the specific fragmentation pattern is observed after a 160-fold overdigestion with MlsI (10 U/µg lambda DNA x 16 hours).

Ligation and Recleavage (L/R) Assay

The ligation and recleavage assay was replaced with LO test after validating experiments showed LO test ability to trace nuclease and phosphatase activities with sensitivity that is higher than L/R by a factor of 100.

Labeled Oligonucleotide (LO) Assay

No detectable degradation of single-stranded or double-stranded labeled oligonucleotides occurred during incubation with 10 units of MlsI for 4 hours.

Blue/White (B/W) Cloning Assay

The B/W assay was replaced with LO test after validating experiments showed LO test ability to detect nuclease and phosphatase activities with sensitivity that equals to that of B/W test.

Quality authorized by:  Jurgita Zilinskiene

PRODUCT USE LIMITATION

This product is developed, designed and sold exclusively *for research purposes and in vitro use only.* The product was not tested for use in diagnostics or for drug development, nor is it suitable for administration to humans or animals.

Please refer to www.thermoscientific.com/onebio for Material Safety Data Sheet of the product.

How to Use MicroAmp™ Reaction Plates, Tube Strips, and Tubes

For use with: Applied Biosystems™ thermal cyclers and real-time PCR systems

Publication Number 100033471 Revision B

How to use MicroAmp™ plates

MicroAmp™ plates and accessories

This table is representative of available plastics and other consumables. To find a complete list, or to search using our online PCR/qPCR plastic selection guide, visit **thermofisher.com/plastics**.

Item	Cat. No. (Quantity)
MicroAmp™ EnduraPlate™ Optical 96-Well Reaction Plates with Barcode	• 4483354 (20 plates; clear) • 4483343 (20 plates; blue) • 4483349 (20 plates; green) • 4483350 (20 plates; red) • 4483395 (20 plates; yellow) • 4483355 (5 plates; assorted colors) • 4483352 (500 plates; clear) • 4483356 (500 plates; assorted colors)
MicroAmp™ Optical 96-Well Reaction Plate with Barcode	• 4306737 (20 plates) • 4326659 (500 plates)
MicroAmp™ Optical 96-Well Reaction Plate with Barcode and Optical Adhesive Films	4314320 (100 plates)
MicroAmp™ Optical 96-Well Reaction Plate	• 4316813 (500 plates) • N8010560 (10 plates)
MicroAmp™ Optical 8-Cap Strips	4323032 (300 strips)

Item	Cat. No. (Quantity)
MicroAmp™ 12-Cap Strip	• N8010534 (200 strips) • N8011534 (1,000 strips)
MicroAmp™ 8-Cap Strip, clear	N8010535 (300 strips)
MicroAmp™ 8-Cap Strip, assorted colors	N8010835 (300 strips of assorted colors)
MicroAmp™ 12-Cap Strip, assorted colors	N8010834 (200 strips of assorted colors)
MicroAmp™ Clear Adhesive Film	4306311 (100 films)
MicroAmp™ Optical Adhesive Film	• 4311971 (100 films) • 4360954 (25 films)
MicroAmp™ Splash Free 96-Well Base	4312063 (10 bases)
MicroAmp™ Adhesive Film Applicator	4333183 (5 applicators)
MicroAmp™ Cap Installing Tool (Handle)	4330015 (1 tool)

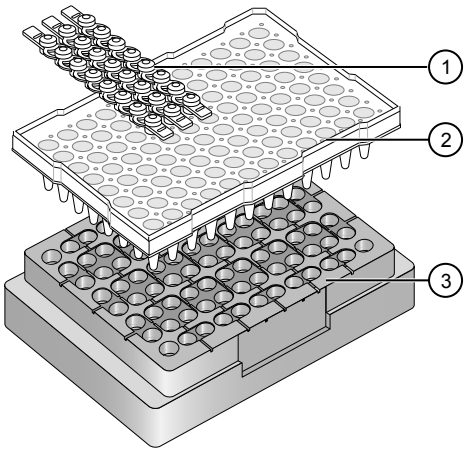
Fill, seal, and load reaction plates

The following procedure describes how to properly load and seal MicroAmp™ reaction plates using cap strips or adhesive seals. For a visual demonstration, watch the video "How to seal a PCR plate" by visiting **PCR/ qPCR Plastics and Seals Education**.

1. Place the reaction plate on a splash-free 96-well base.
2. Pipette the samples into the sample wells.
3. Seal the plates using one of the following:
   - MicroAmp™ Cap Strips.
   - MicroAmp™ Adhesive Film.
4. Place the sealed reaction plate into the instrument without the splash-free base.

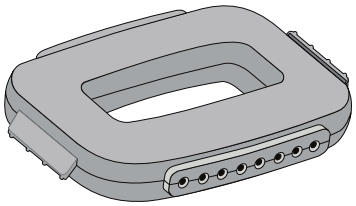
Seal plates with cap strips

1. Align and place the MicroAmp™ Cap Strip on the appropriate wells on the MicroAmp™ Optical 96-Well Reaction Plate.



① MicroAmp™ 8-Cap Strip
② MicroAmp™ Optical 96-Well Reaction Plate 0.2-mL
③ MicroAmp™ Splash Free 96-Well Base

2. Seal the cap strips using the rocking capping tool:



   a. Slip your fingers through the handle with the holes in the tool facing down for domed caps and with the holes facing up for optical caps.

   b. Align the tool over the first eight caps in a row.

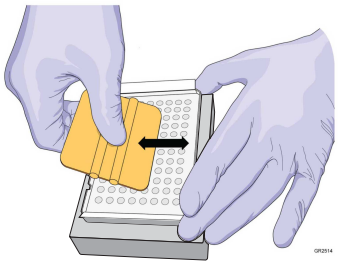
   c. Rock the tool back and forth a few times to seal the caps.

   d. Repeat for all remaining rows.

Seal plates with adhesive covers

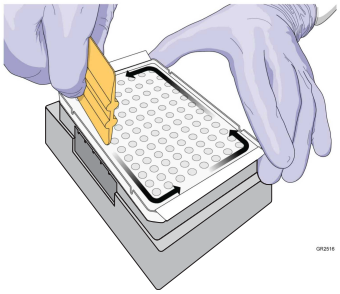
IMPORTANT! Apply significant downward pressure on the applicator in all steps to form a complete seal on top of the wells. Pressure is required to activate the adhesive on the optical cover.

1. Remove the backing of the adhesive film.
2. Align the adhesive film so as to cover all wells while placing on the plate, then rub the flat edge of the applicator back and forth along the long edge of the plate.



3. Rub the flat edge of the applicator back and forth along the short edge (width) of the plate.

4. Rub the end of the applicator horizontally and vertically between all wells.
5. Rub the end of the applicator around all outside edges of the plate using small back and forth motions to form a complete seal around the outside wells.



How to use MicroAmp™ tube strips and cap strips

MicroAmp™ tube strips and accessories

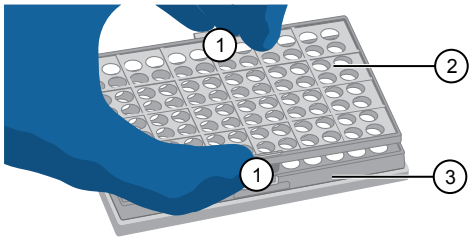
This table is representative of available plastics and other consumables. To find a complete list, or to search using our online PCR/qPCR plastic selection guide, visit **thermofisher.com/plastics**.

Consumables	Cat. No. (Quantity)
MicroAmp™ 8-Tube Strip (0.2 mL)	• N8010580 (125 tube strips) • N8010838 (120 tube strips; assorted colors)
MicroAmp™ Fast 8-Tube Strip (0.1 mL)	4358293 (125 strips)
MicroAmp™ 96-Well Tray/ Retainer Set - Blue color	4381850 (10 tray/retainer sets)
MicroAmp™ 8-Cap Strip Natural color, dome cap.	N8010535 (300 strips)
MicroAmp™ 8-Cap Strip, assorted colors Assorted color, dome cap.	N8010835 (300 strips)
MicroAmp™ Optical 8-Cap Strip	4323032 (300 strips)
MicroAmp™ Splash Free 96-Well Base	4312063 (10 bases)
MicroAmp™ Cap Installing Tool (Handle)	4330015 (1 tool)

Prepare samples using MicroAmp™ tubes/tube strips with separate cap strips

The following procedure describes how to properly load and seal MicroAmp tube strips using cap strips and the MicroAmp 96-well tray/retainer set. For a visual demonstration, watch the video "How to use adapter tray retainers" by visiting **PCR/qPCR Plastics and Seals Education**.

1. Separate the **blue** tray and retainer by squeezing the release catch as indicated in the graphic.

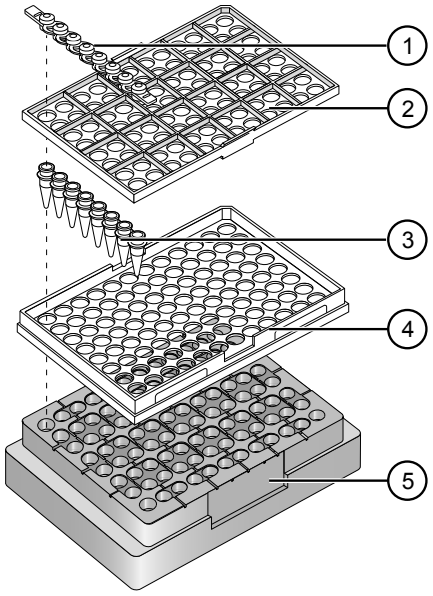


① Release catch
② MicroAmp™ 96-Well Retainer
③ MicroAmp™ 96-Well Tray

2. Place the **blue** tray on the 96-well base.

3. Load the tube strips on the tray.

4. Pipette the reaction mixture into the tubes.
5. Place the **blue** retainer over the tubes and snap the retainer into the tray.
6. Seal the tube strip using a MicroAmp™ cap strip. See “Seal tube strips with cap strips” on page 6 for instructions.
7. Remove the **blue** tray/retainer assembly containing the sealed tube strips from the 96-well base and place the assembly into the instrument.

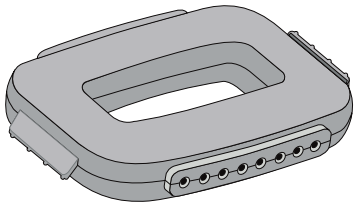


① MicroAmp™ 8-Cap strip
② MicroAmp™ 96-Well Retainer
③ MicroAmp™ 8-Tube Strip (0.2-mL) or MicroAmp™ Reaction Tube without Cap (0.2-mL)
④ MicroAmp™ 96-Well Tray
⑤ MicroAmp™ Splash Free 96-Well Base

Seal tube strips with cap strips

IMPORTANT! Apply significant downward pressure on the sealing tool in all steps to form a complete seal on top of the tubes.

1. Align and place the cap strips on the tubes.
2. Seal the cap strips using the rocking capping tool:



   a. Slip your fingers through the handle with the holes in the tool facing down for domed caps and with holes facing up for optical caps.

b. Align the tool over the first eight caps in a row.

c. Rock the tool back and forth a few times to seal the caps.

d. Repeat for all remaining rows.

How to use MicroAmp™ tube strips with attached caps

MicroAmp™ tubes and accessories

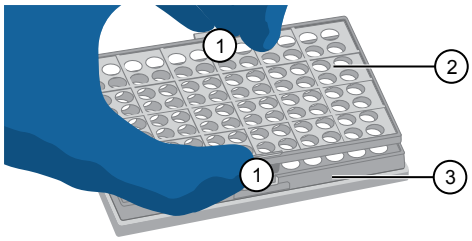
This table is representative of available plastics and other consumables. To find a complete list, or to search using our online PCR/qPCR plastic selection guide, visit **thermofisher.com/plastics**.

Consumables	Cat. No. (Quantity)
MicroAmp™ 8-Tube Strip with Attached Domed Caps (0.2 mL)	A30589 (125 strips)
MicroAmp™ Optical 8-Tube Strip with Attached Optical Caps (0.2 mL)	A30588 (125 strips)
MicroAmp™ 96-Well Tray / Retainer Set- Blue color	4381850 (10 trays/retainer sets)
MicroAmp™ Splash Free 96-Well Base	4312063 (10 bases)
MicroAmp™ Cap Installing Tool (Handle)	4330015 (1 tool)

Prepare samples using MicroAmp™ tube strips with attached caps

The following procedure describes how to properly load and seal MicroAmp tube strips with attached caps using the MicroAmp 96-well tray/retainer set. For a visual demonstration, watch the video "How to use adapter tray retainers" by visiting **PCR/qPCR Plastics and Seals Education**.

1. Separate the **blue** tray from the retainer by squeezing the release catch as indicated in the graphic.



① Release catch
② MicroAmp™ 96-Well Retainer
③ MicroAmp™ 96-Well Tray

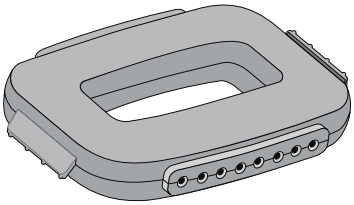
2. Place the **blue** tray on the splash-free 96-well base.

   Note: Only the bottom tray is used for tubes with attached caps.

3. Load the tube strips with attached caps into the tray.

4. Pipette the reaction mixture into the tubes.

5. Seal the cap strips using the rocking capping tool:



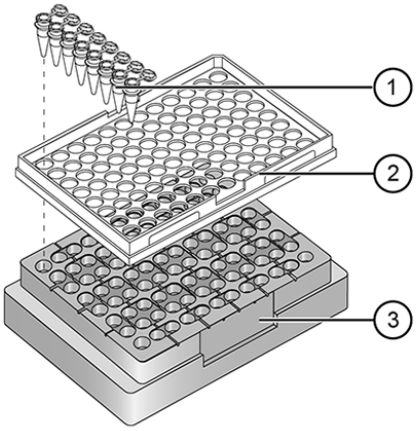
   a. Slip your fingers through the handle with the holes in the tool facing down for domed caps and with the holes facing up for optical caps.

   b. Align the tool over the first eight caps in a row.

   c. Rock the tool back and forth a few times to seal the caps.

   d. Repeat for all remaining rows.

6. Remove the **blue** tray containing the sealed tube strips from the 96-well base and place the tray and sealed tube strips into the instrument.



① MicroAmp™ 8-Tube Strip with Attached Caps (0.2-mL)
② MicroAmp™ 96-Well Tray
③ MicroAmp™ Splash Free 96-Well Base

How to use MicroAmp™ individual tubes

MicroAmp™ tubes and accessories

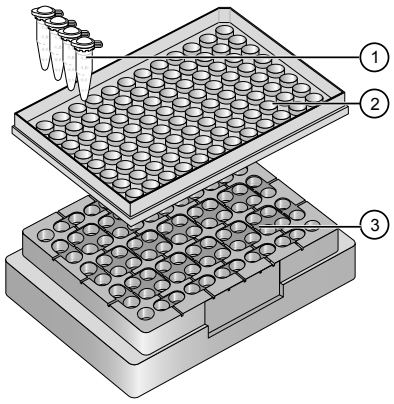
This table is representative of available plastics and other consumables. To find a complete list, or to search using our online PCR/qPCR plastic selection guide, visit **thermofisher.com/plastics**.

Consumables	Cat. No. (Quantity)
MicroAmp™ 96-Well Tray for VeriFlex™ Systems - black color	4379983 (10 trays)
MicroAmp™ Reaction Tubes with Cap (0.2 mL)	• N8010540 (1,000 tubes) • N8011540 (10,000 tubes) • N8010840 (1,000 tubes; assorted colors) • N8010612 (1,000 tubes; autoclaved)
MicroAmp™ Fast Reaction Tube with Cap (0.1 mL)	4358297 (1000 tubes)
MicroAmp™ Multi-Removal Tool	4313950 (1 tool)
MicroAmp™ Splash Free 96-Well Base	4312063 (10 bases)

Prepare samples using MicroAmp™ Reaction Tubes

The following procedure describes how to properly load and seal MicroAmp™ individual tubes with attached caps and the MicroAmp™ 96-well tray for VeriFlex systems. For a visual demonstration, watch the video "How to use adapter tray retainers" by visiting **PCR/qPCR Plastics and Seals Education**.

1. Set the **black** tray on a 96-well base.
2. Place the reaction tubes in the **black** tray.



① MicroAmp™ Reaction Tube with Cap (0.2-mL)
② MicroAmp™ 96-Well Tray for VeriFlex™ Blocks
③ MicroAmp™ Splash Free 96-Well Base

3. Pipette the reaction mixture into the reaction tubes.

4. Cap the tubes.

5. Remove the **black** tray with sealed reaction tubes from the 96-well base and place the tray and sealed tubes into the instrument.

Limited product warranty

Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

 For descriptions of symbols on product labels or product documents, go to **thermofisher.com/symbols-definition**.

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9 June 2020

MicroAmp™ plastic consumables compatibility chart for Applied Biosystems™ endpoint PCR systems and genetic analyzers

		3 x 32-well	96-well			96-well Fast	384-well		Genetic analyzers	
Product	**Cat. No.**	ProFlex™	Veriti™, ProFlex, SimpliAmp™	2720	9700	Veriti	ProFlex, Veriti	9700	310	3130, 3130xl, 3500, 3500xL, 3730, 3730xl
96-well 0.2 mL reaction plates										
Optical 96-Well Plate	N8010560, 4316813		●	●	●					●
Optical 96-Well Plate with Barcode	4306737, 4326659		●	●	●					●
96-Well Plate with Barcode & Optical Caps	403012		●	●	●					
Optical 96-Well Plate with Barcode & Optical Adhesive Films	4314320		●	●	●					
EnduraPlate Optical 96-Well Clear Plate with Barcode*	4483354, 4483352		●	●	●					●
TriFlex 3 x 32-Well Reaction Plate	A32810, A32811	●**	●	●	●					
96-well 0.1 mL reaction plates										
Fast Optical 96-Well Plate, 0.1 mL	4346907					●			●	●
Fast Optical 96-Well Plate with Barcode, 0.1 mL	4346906, 4366932					●			●	●
EnduraPlate Optical 96-Well Fast Clear Plate with Barcode*	4483485, 4483494					●			●	●
384-well reaction plates										
Optical 384-Well Plate	4343370						●	●		●
Optical 384-Well Plate with Barcode	4309849, 4326270, 4343814						●	●		●
EnduraPlate Optical 384-Well Clear Plate with Barcode*	4483285, 4483273						●	●		●
Strip tubes and caps										
Fast 8-Tube Strip, 0.1 mL	4358293					●				
Optical 8-Tube Strip with Attached Optical Caps, 0.2 mL	A30588	●	●	●	●					
8-Tube Strip with Attached Domed Caps, 0.2 mL	A30589	●	●	●	●					
8-Tube Strip, 0.2 mL*	N8010580	●	●	●	●				●	
Optical 8-Tube Strip, 0.2 mL	4316567	●	●	●	●					
8-Cap Strip*	N8010535, N8011535	●	●	●	●	●				
Optical 8-Cap Strip	4323032	●	●	●	●	●				
12-Cap Strip*	N8010534, N8011534		●	●	●	●				
Single tubes										
Fast Reaction Tube with Cap, 0.1 mL	4358297, 4358293					●				
Reaction Tube with Cap, 0.2 mL*	N8010540, N8010612, N8011540	●	●	●	●					
Reaction Tube without Cap, 0.2 mL*	N8010533, N8011533	●	●	●	●					
Optical Tube without Cap, 0.2 mL	N8010933	●	●	●	●					
Seals and covers										
Clear Adhesive Film	4306311		●		●	●	●	●		
Optical Adhesive Film	4360954, 4311971		●		●	●	●	●		
96-Well Full Plate Cover	N8010550			●	●					
32-Well Clear Adhesive Film	A32812	●**	●	●	●					
Accessories										
Splash-Free 96-Well Base	4312063		●	●	●	●				
96-Well Support Base	4379590		●	●	●	●				●
96-Well Base	N8010531		●	●	●					
96-Well Reaction Tube/Tray/Retainer Set, 0.2 mL	403083, 403086			●	●					

* Multiple colors are available. ** Do not use MicroAmp™ 3 x 32-Well Retainer (Cat. No. 4481669).

Note: Experiments using one or two 8-tube strips with attached caps require blank tube strips to balance lid pressure on the block or the use of the MicroAmp™ 96-Well Tray/Retainer Set (Cat. No. 4381850)—bottom part of tray *only*. For use with 96-well block of Applied Biosystems™ ProFlex, SimpliAmp, and Veriti thermal cyclers.

Find out more at **thermofisher.com/plastics**

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applied biosystems

MicroAmp™ plastic consumables compatibility chart for Applied Biosystems™ real-time PCR systems

Product	Cat. No.	48-well	96-well			96-well Fast			384-well
		StepOne™	7000	7300, 7500	QuantStudio™ 3/5/6/7/12K, ViiA™ 7, 7900HT	StepOnePlus™	7500	QuantStudio 3/5/6/7/12K, ViiA 7, 7900HT	QuantStudio 5/6/7/12K, ViiA 7, 7900HT
96-well 0.2 mL reaction plates									
Optical 96-Well Plate	N8010560, 4316813		●	●	●				
Optical 96-Well Plate with Barcode	4306737, 4326659		●	●	●				
Optical 96-Well Plate with Barcode & Optical Caps	403012		●	●	●				
Optical 96-Well Plate with Barcode & Optical Adhesive Films	4314320		●	●	●				
EnduraPlate Optical 96-Well Clear Plate with Barcode*	4483354, 4483352			●**	●				
96-well 0.1 mL reaction plates									
Fast Optical 96-Well Plate, 0.1 mL	4346907					●	●	●	
Fast Optical 96-Well Plate with Barcode, 0.1 mL	4346906, 4366932					●	●	●	
EnduraPlate Optical 96-Well Fast Clear Plate with Barcode*	4483485, 4483494					●	●	●	
384-well reaction plates									
Optical 384-Well Plate	4343370								●
Optical 384-Well Plate with Barcode	4309849, 4326270, 4343814								●
EnduraPlate Optical 384-Well Clear Plate with Barcode*	4483285, 4483273								●
48-well reaction plates									
Fast Optical 48-Well Plate	4375816	●							
Strip tubes and caps									
Fast 8-Tube Strip, 0.1 mL	4358293	●				●	●	●	
Optical 8-Tube Strip with Attached Optical Caps, 0.2 mL	A30588		●	●	●				
Optical 8-Tube Strip, 0.2 mL	4316567		●	●	●				
Optical 8-Cap Strip	4323032	●	●	●	●	●	●	●	
Single tubes and caps									
Fast Reaction Tube with Cap, 0.1 mL	4358297	●				●		●	
Optical Tube without Cap, 0.2 mL	N8010933		●	●					
Seals and covers									
Optical Adhesive Film	4360954, 4311971		●	●	●	●	●	●	●
48-Well Optical Adhesive Film	4375323	●							
Reaction trays									
96-Well Tray/Retainer Set	403081		●						
Fast 48-Well Tray	4375282	●							
96-Well Tray for VeriFlex Blocks	4379983					●			
Accessories									
Splash-Free 96-Well Base	4312063		●	●	●	●	●	●	
96-Well Support Base	4379590		●	●	●	●	●	●	
96-Well Base	N8010531		●	●	●	●	●	●	

* Multiple colors are available. ** Requires use of proper adapter, Cat. No. A24820.

Note: Experiments using one or two 8-tube strips with attached caps require blank tube strips to balance lid pressure on the block or the use of the MicroAmp™ 96-Well Tray/Retainer Set (Cat. No. 4381850)—bottom part of tray *only*. For use with 96-well block of Applied Biosystems™ 7000, 7300, 7500, and ViiA 7 systems, and QuantStudio 3/5/6/7/12K instruments.

Find out more at **thermofisher.com/plastics**

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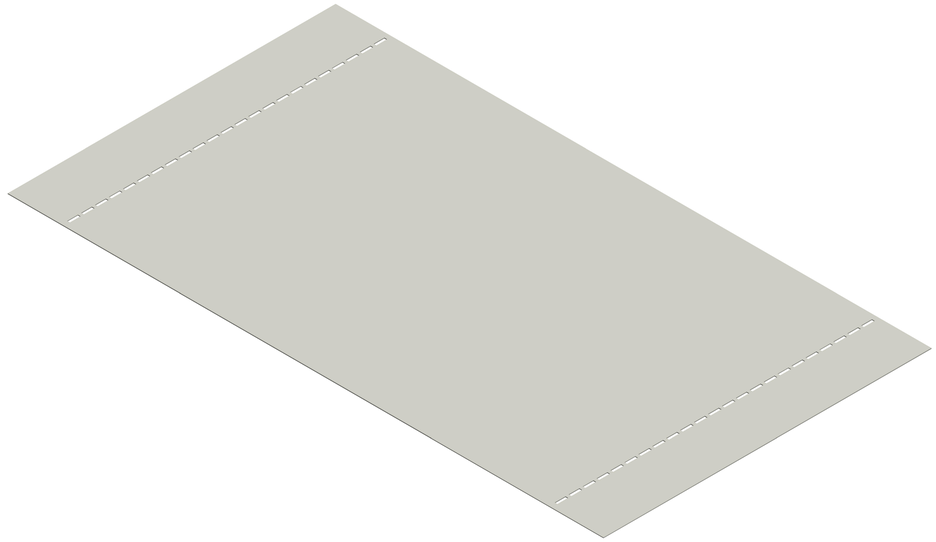

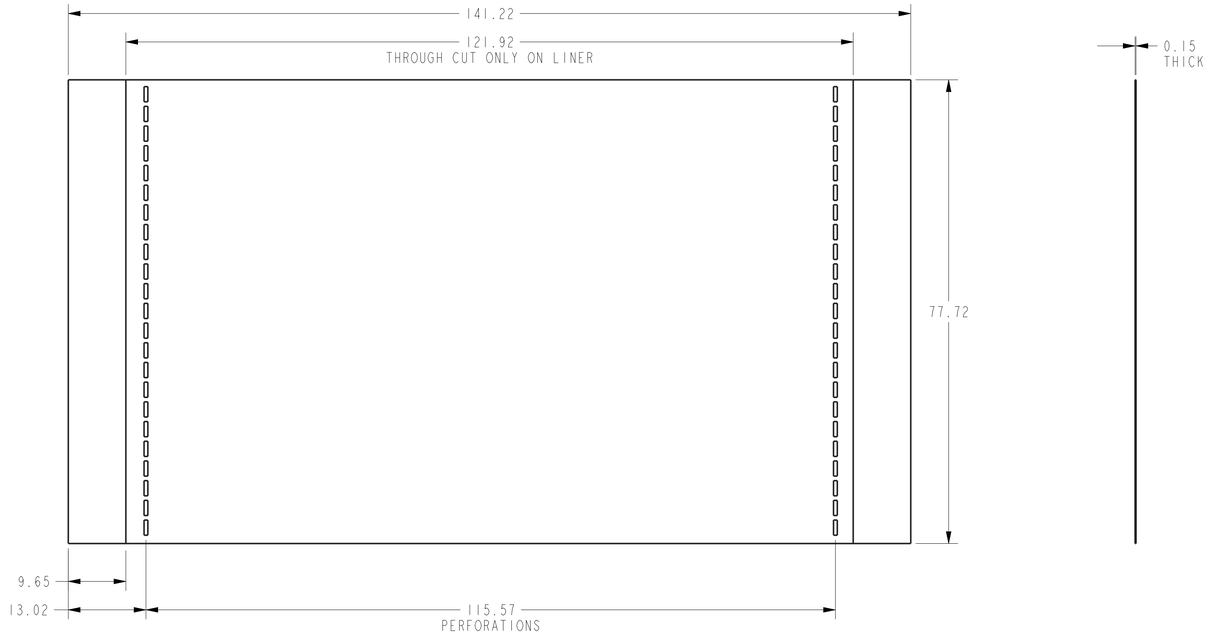

PART #	PACK SIZE	DESCRIPTION
4311971	100 COVERS	MicroAmp® Optical Adhesive Film
4360954	25 COVERS	MicroAmp® Optical Adhesive Film

UNLESS OTHERWISE SPECIFIED, DIMENSIONS AND TOLERANCES ARE PER ASME Y14.5M AND ARE IN MILLIMETERS. TOLERANCES ARE AS FOLLOWS:

✓

METRIC

MATERIAL: N/A

FINISH: N/A

DESIGNED | DATE

THIRD ANGLE PROJECTION

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DESCRIPTION: ADHESIVE OPTICAL COVER

SIZE: D | SCALE: 2.000 | PART NO.: 4311977 | REV

DO NOT SCALE DRAWING | SHEET 1 OF 1

invitrogen

Fast, reliable detection of viable RNA

New Qubit RNA IQ Assay

Introducing the breakthrough Invitrogen™ Qubit™ RNA IQ Assay,* developed to quickly assess the quality and integrity of an RNA sample. This assay works by utilizing two unique dyes—one binds to large, intact and/or structured RNA, and the other selectively binds to small, degraded RNA.

The Invitrogen™ Qubit™ 4 Fluorometer and Qubit RNA IQ Assay offer the following features:

- **Convenience**—use as little as 1 µL of sample
- **Ease of use**—simply add RNA sample to the RNA IQ working solution, then measure with the Qubit 4 Fluorometer
- **Speed**—obtain accurate measurement of RNA degradation in ~4 seconds per sample

Don't forget that the new Qubit 4 Fluorometer also offers accurate and sensitive quantitation of DNA and protein.

* Note: The Qubit RNA IQ Assay for the detection of degraded RNA can only be run on the Qubit 4 Fluorometer and cannot be performed on the original Qubit, Qubit 2.0, or Qubit 3.0 Fluorometers.

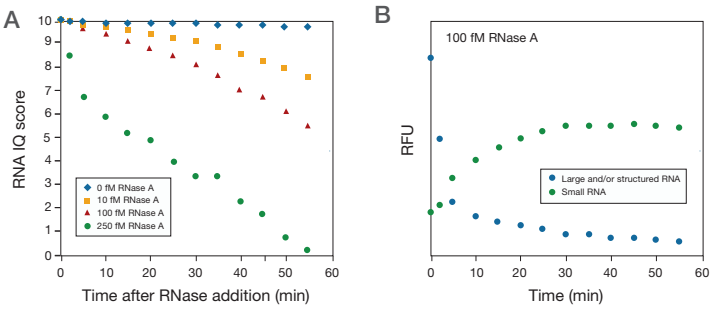

Figure 1. rRNA degradation by RNase A measured using the Qubit RNA IQ Assay. rRNA degradation by RNase A was measured in real time using the RNA IQ assay, demonstrating the loss of large, structured RNA and the increase of small, degraded RNA fragments over time. **(A)** Triplicate samples of 100 ng/mL rRNA solutions were incubated with increasing amounts RNase A in the final RNA IQ assay working solution. **(B)** The 100 fM RNase A shows the increase in signal from the small-RNA dye corresponding to a decrease in the signal from the large and/or structured RNA.

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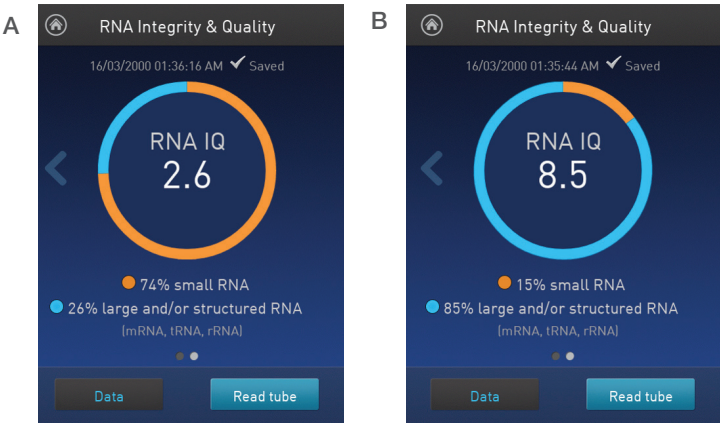

Figure 2. A proprietary algorithm is used to report a quality score representative of the ratio of small and large and/or structured RNA in the sample. The score is a value from 1 to 10, similar to other RNA quality scores. With the Qubit RNA IQ Assay, a small number indicates that the sample consists of mainly small RNA **(A)**, and a larger number indicates that the sample consists of mainly large RNA or RNA with tertiary structure **(B)**.

Ordering information

Product	Initial sample concentration	Quantitation range	Quantity	Cat. No.
RNA integrity and quality kit				
Qubit™ RNA IQ Assay Kit*	NA	NA	75 assays	Q33221
			275 assays	Q33222
RNA quantitation kits				
Qubit RNA BR Assay Kit	1 ng/µL to 1 µg/µL	20–1,000 ng	100 assays	Q10210
			500 assays	Q10211
Qubit RNA HS Assay Kit	250 pg/µL to 100 ng/µL	5–100 ng	100 assays	Q32852
			500 assays	Q32855
Qubit RNA XR Assay Kit	1 ng/µL to 8 µg/µL	20 ng–8 µg	100 assays	Q33223
			500 assays	Q33224
Qubit microRNA Assay Kit	50 ng/mL to 100 µg/mL	1–1,000 ng	100 assays	Q32880
			500 assays	Q32881
DNA quantitation kits				
Qubit ssDNA Assay Kit	50 pg/µL to 200 ng/µL	1–200 ng	100 assays	Q10212
Qubit dsDNA BR Assay Kit	100 pg/µL to 1,000 ng/µL	2–1,000 ng	100 assays	Q32850
			500 assays	Q32853
Qubit dsDNA HS Assay Kit	10 pg/µL to 100 ng/µL	0.2–100 ng	100 assays	Q32851
			500 assays	Q32854
Qubit 1X dsDNA HS Assay Kit	10 pg/µL to 100 ng/µL	0.2–100 ng	100 assays	Q33230
			500 assays	Q33231
Protein quantitation kit				
Qubit Protein Assay Kit	12.5 µg/mL to 5 mg/mL	0.25–5 µg	100 assays	Q33211
			500 assays	Q33212
Instrument and accessories				
Qubit 4 Fluorometer			1 instrument	Q33226
Qubit 4 RNA IQ Starter Kit			1 kit	Q33229
Qubit 4 Quantitation Starter Kit			1 kit	Q33227
Qubit 4 NGS Starter Kit			1 kit	Q33228
Qubit Assay Tubes			500 tubes	Q32856

* Note: The Qubit RNA IQ Assay for the detection of degraded RNA can only be run on the Qubit 4 Fluorometer and cannot be performed on the original Qubit, Qubit 2.0, or Qubit 3.0 Fluorometers.

Request a demo or place an order at
thermofisher.com/qubit

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