

thermo scientific

Molecular biology research essentials—
discovery starts here



Six popular products selected for reliable
performance and affordability

ThermoFisher
SCIENTIFIC

Engineered to impress

Thermo Scientific™ Maxima™ H Minus Reverse Transcriptase (RT) offers robust performance in cDNA synthesis. This RT is engineered with improved thermostability, processivity, and activity rates.

- **High yields**—better transcription of cDNA over a wide temperature range (up to 65°C)
- **Fast results**—15–30 minute reaction time
- **Simplified workflow**—integrated gDNA removal step
- **Versatility**—multiple formats available including stand-alone enzyme, cDNA synthesis kits, and one-tube RT master mix

thermofisher.com/maxima

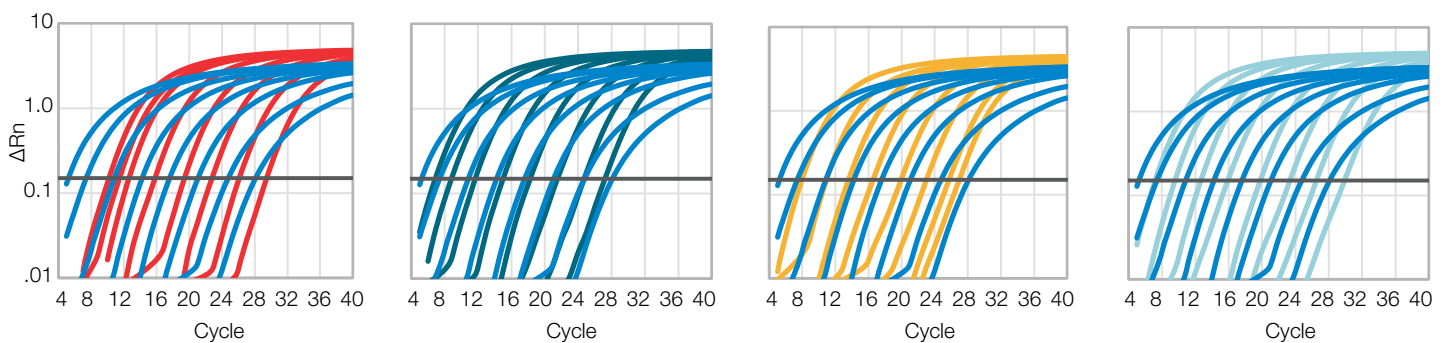


Figure 1. Enhanced transcription efficiency of Thermo Scientific™ Maxima™ H Minus cDNA Synthesis Master Mix. The Maxima H Minus cDNA Synthesis Master Mix demonstrates better efficiency when compared to other suppliers' RTs over a wide range of input RNA amounts. Amplification of the human 18S RNA gene was performed on 10-fold serial dilutions of HeLa total RNA (1 μ g to 0.1 μ g). First-strand cDNA was generated using the Maxima H Minus cDNA Synthesis Master Mix, Thermo Scientific™ Maxima™ First Strand cDNA Synthesis Kit for RT-qPCR, and RTs from four other suppliers. cDNA was amplified using the Thermo Scientific™ Luminaris™ Probe qPCR Master Mix, low ROX on the Applied Biosystems™ ViiA™ 7 Real-Time PCR System. Amplification plots indicate variation of ΔRn with PCR cycles.

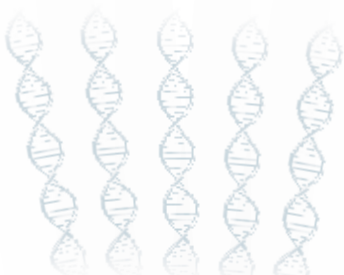
- Bio-Rad iScript Reverse Transcription Supermix
- Quanta qScript cDNA SuperMix
- NEB ProtoScript II First Strand cDNA Synthesis Kit
- TaKaRa PrimeScript RT Master Mix
- Maxima H Minus cDNA Synthesis Master Mix
- Threshold

Better PCR— all day, every day

Thermo Scientific™ DreamTaq™ DNA Polymerase offers enhanced performance compared to other standard *Taq* polymerases and is available in both standard and hot-start formats.

- **Maximum convenience**—multiple formats from 2x master mix to green formats for direct gel loading
- **Minimal optimization**—includes MgCl₂; no need for additional optimization for amplification
- **Greater efficiency**—higher yields and increased PCR sensitivity
- **Broad compatibility**—works with all routine PCR applications including colony PCR, genotyping, clone screening, and more

thermofisher.com/dreamtaq



Did you know?

Direct gel loading buffers eliminate tedious steps, helping reduce potential pipetting errors. Reagents with direct gel loading options are marked with this icon:

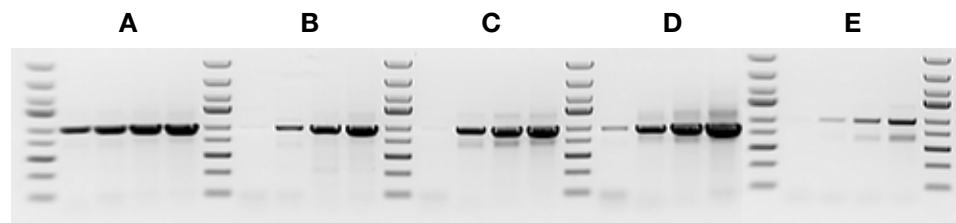


Figure 2. Higher yields with low amounts of DNA template. A 956 bp fragment from human genomic DNA was amplified with **(A)** DreamTaq DNA Polymerase and with *Taq* DNA polymerases from other suppliers: **(B)** NEB™ OneTaq™, **(C)** Promega™ GoTaq™, **(D)** Biorline™ MyTaq™, and **(E)** TaKaRa™ Taq DNA polymerases according to suppliers' recommendations using 30 pg, 300 pg, 3 ng, and 30 ng of template DNA. Only DreamTaq DNA Polymerase was able to amplify from all template amounts giving high yields.

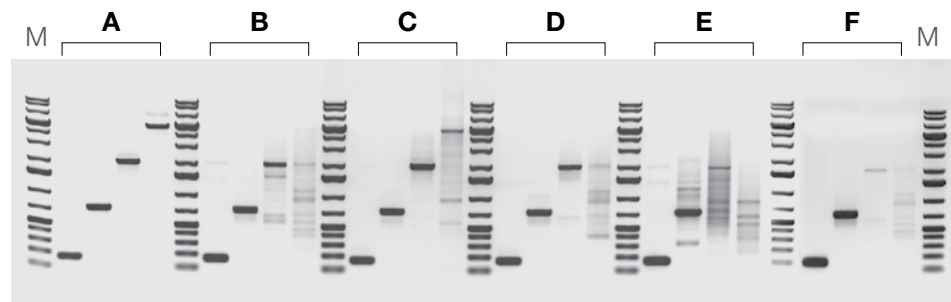


Figure 3. Robust amplification of human genomic DNA. DreamTaq Hot Start DNA Polymerase produces more product and longer amplicons than hot-start DNA polymerases from other suppliers. Amplification products (160 bp, 727 bp, 2 kb, or 5 kb) from human genomic DNA are shown in the figure above. **(M)** Thermo Scientific™ GeneRuler™ 1 kb Plus DNA Ladder; **(A)** DreamTaq Hot Start DNA Polymerase; **(B)** Promega GoTaq G2 Hot Start Polymerase; **(C)** NEB OneTaq Hot Start DNA Polymerase; **(D)** TaKaRa Taq DNA Polymerase Hot Start Version; **(E)** Kapa Biosystems™ KAPA2G™ Robust HotStart PCR Kit; **(F)** Biorline MyTaq HS DNA Polymerase.



Preferred and proven

Thermo Scientific™ Phusion™ high-fidelity DNA polymerases have been referenced in thousands of publications. Phusion DNA polymerases are recommended for a range of PCR applications, from routine cloning to the most demanding and specialized applications.

- **High fidelity**—up to 52x more accurate than *Taq* polymerase; up to 6x more accurate than *Pfu* DNA polymerase
- **High speed**—increased processivity (extension 15–30 sec/kb) allows shorter reaction times
- **Enhanced specificity**—reduced nonspecific amplification and primer degradation
- **Improved yields**—high product yields with minimal enzyme amounts
- **Versatility**—over a dozen formats available, enabling high-fidelity PCR for most applications

thermofisher.com/phusion

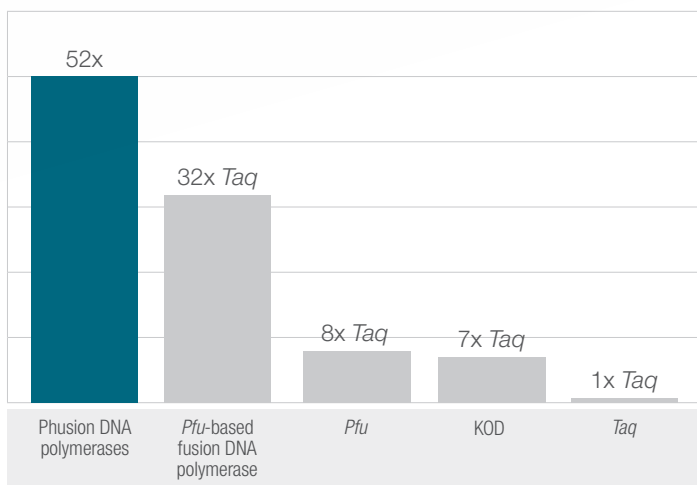


Figure 4. Relative fidelity was calculated with reference to fidelity of *Taq* DNA polymerase. Fidelity = 1/error rate. Relative fidelity was calculated with reference to fidelity of *Taq* polymerase.

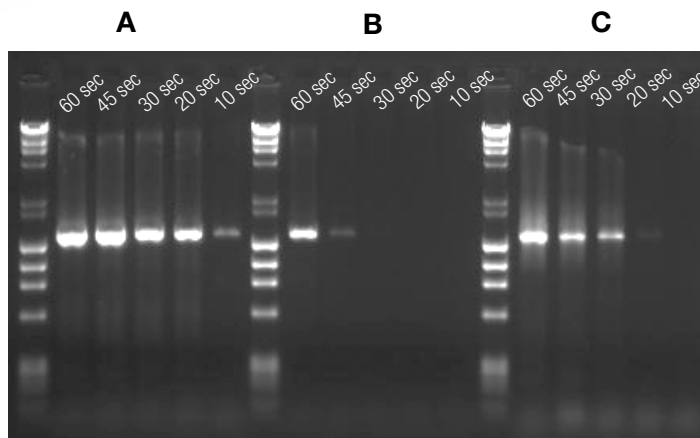


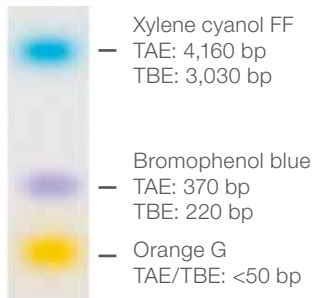
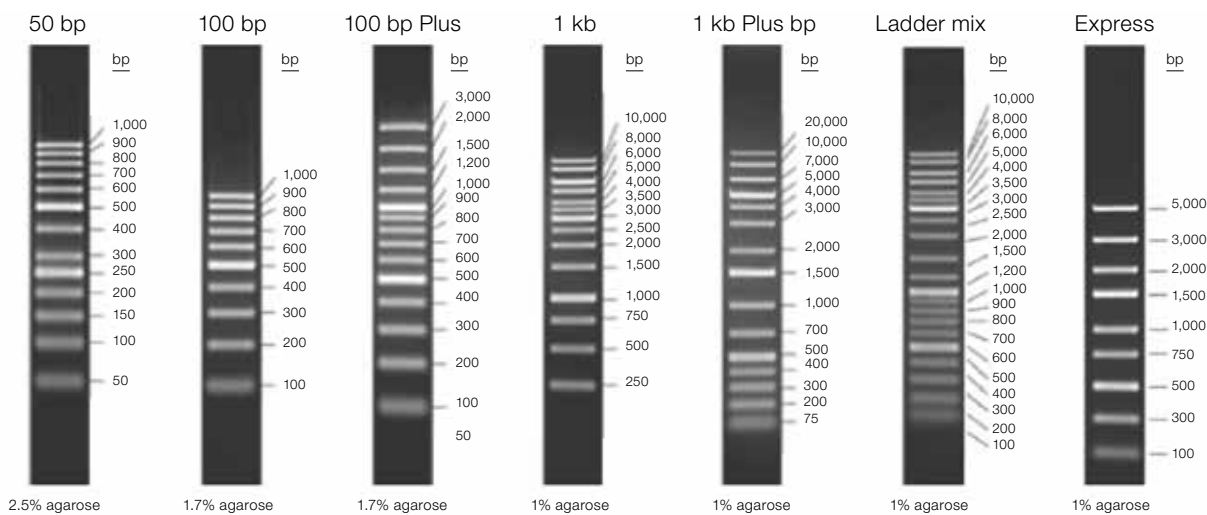
Figure 5. High speed and yields with Thermo Scientific™ Phusion™ Flash High-Fidelity PCR Master Mix. A 1.5 kb human cathepsin K gene was amplified with **(A)** Phusion Flash II DNA Polymerase and polymerases from other suppliers **(B)** Agilent™ PfuUltra™ II Fusion and **(C)** Qiagen™ Fast Cycling 2X Mix using varying extension times (10–60 sec). Only the Phusion Flash High-Fidelity PCR Master Mix containing Phusion Flash II DNA Polymerase was able to amplify the 1.5 kb gene with very short extension times of 10 and 20 sec. It also produced superior yields of specific product compared to other enzymes tested.

Clean bands, clear results

Thermo Scientific™ GeneRuler™ DNA ladders contain mixtures of individual chromatography-purified DNA fragments, designed to deliver precision and ease of use for everyday DNA electrophoresis.

- **Wide selection**—includes popular 1 kb, 100 bp, 50 bp, low-range, and high-range ladders
- **Clear results**—sharp, bright reference bands
- **Convenient tracking of DNA samples**—three tracking dyes to easily monitor separation of a wide range of DNA fragment sizes
- **Environmentally friendly**— shipping at ambient temperature eliminates the need for excess packaging

thermofisher.com/generuler



TriTrack loading buffer has three convenient tracking dyes to help easily monitor separation of DNA ladders. Moreover, these dyes do not interfere with UV visualization.

Figure 6. The most commonly used GeneRuler DNA ladders (top panel); migration of dyes in Thermo Scientific™ TriTrack™ loading buffer (bottom panel).

One buffer for 176 enzymes—it's that easy



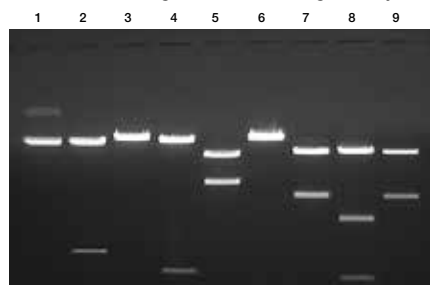
Thermo Scientific™ FastDigest™ Restriction Enzymes support complete, fast digestions of DNA in single, universal buffer.

- **Easy setup**—100% activity of all 176 FastDigest enzymes in one buffer
- **Fast results**—complete DNA digestion in 5–15 minutes
- **Downstream compatibility**—buffer compatibility with selected DNA- and RNA-modifying enzymes such as ligases, phosphatases, kinases and mesophilic DNA polymerases

thermofisher.com/fastdigest

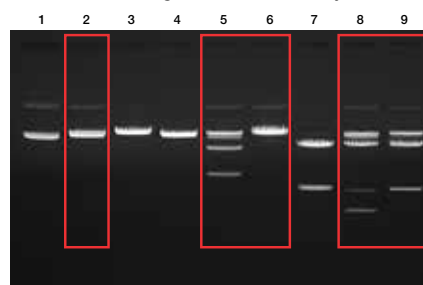


A. Plasmid DNA digested with FastDigest enzymes



- 1: Undigested plasmid DNA
- 2: FastDigest BcuI
- 3: FastDigest XbaI
- 4: FastDigest NdeI
- 5: FastDigest Sall
- 6: FastDigest XmaJI
- 7: FastDigest Eco31I
- 8: FastDigest Eco31I
- 9: FastDigest BglII

B. Plasmid DNA digested with NEB enzymes



- 1: Undigested plasmid DNA
- 2: SpeI-HF
- 3: XbaI
- 4: NdeI
- 5: Sall-HF
- 6: AvrII
- 7: BsaI
- 8: EaqI-HF
- 9: BglII

Figure 7. Comparison of digestion efficiencies of restriction enzymes. (A) FastDigest restriction enzymes digest plasmid DNA much more efficiently compared to the **(B)** NEB enzymes. In this experiment, using the NEB protocol, 1 µg of plasmid DNA was digested in ~15 minutes.

Fits right in



Quality PCR/qPCR plastics free of contaminants and inhibitors are essential to help enable optimal performance. Regardless of the plastics format you select, proper fit and uniform heat transfer during thermal cycling are essential.

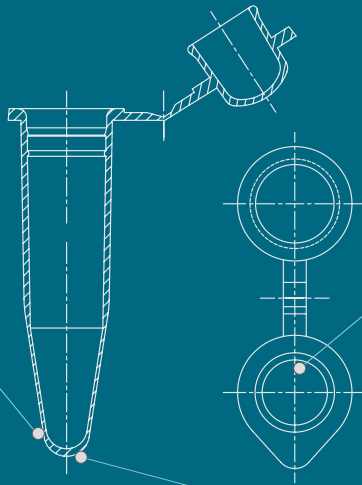
- High-quality—designed, manufactured, and tested to enable optimal PCR and qPCR performance

- Multiple formats
 - 24, 32, 48, 96, and 384 wells
 - Non-, semi-, and full-skirted
 - Low profile and standard
 - Multicolor
 - Various tubes, tube strips, and sealing options available
- Sample identification—standard and customized plate barcoding available

thermofisher.com/thermoscientificplastics

Innovative product design

High efficiency,
reduced variability
Uniform, ultrathin walls
enable maximum and
consistent heat transfer for
equally high performance
from every sample.



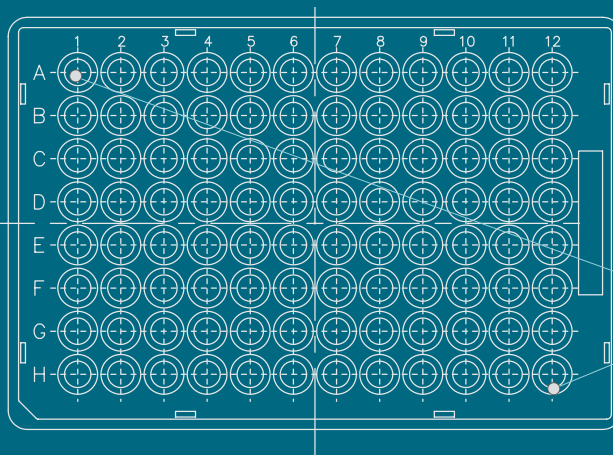
Secure, easy sealing
Specially designed caps
create a tight seal that
is still easy to open and
close. Strip tubes are
available in individually
attached cap versions.

Evaporation protection
Raised rim design around
each well enables secure
sealing and safeguards
against evaporation.



Ultrathin wall technology
for fast PCR
Thermo Scientific™
ultrathin-walled tubes
and plates represent the
new generation of PCR
consumables, bringing
significantly improved
performance in fast PCR
and qPCR assays. Each
well wall is approximately
50% thinner than standard
thin-walled tubes and
plates. This further reduces
the thermal barrier to heat
flow into and out of the PCR
sample, resulting in faster
and more robust reactions.

White plastics for
enhanced qPCR detection
Thermo Scientific™ white
qPCR plastics are designed
to provide sensitive and
accurate fluorescence
detection by preventing
refraction out of the tube
and increasing the
signal-to-noise ratio.



Consistent results
from A1 to H12
Reinforced plate decks and
ultrarigid options prevent
plate warping and keep heat
transfer consistent across
the entire plate.

Ordering information

Product	Quantity	Cat. No.
Maxima reverse transcriptases		
Maxima H Minus Reverse Transcriptase	10,000 units	EP0752
Maxima H Minus cDNA Synthesis Master Mix*	50 rxn	M1661
Maxima H Minus First Strand cDNA Synthesis Kit*	20 rxn	K1651

* Formats with dsDNase are available.

DreamTaq DNA polymerases**		
DreamTaq DNA Polymerase	200 units	EP0701
DreamTaq PCR Master Mix	200 rxn	K1071
DreamTaq Green DNA Polymerase	200 units	EP0711
DreamTaq Green PCR Master Mix	200 rxn	K1081
DreamTaq Hot Start DNA Polymerase	200 units	EP1701
DreamTaq Hot Start PCR Master Mix	200 rxn	K9011
DreamTaq Hot Start Green DNA Polymerase	200 units	EP1711
DreamTaq Hot Start Green PCR Master Mix	200 rxn	K9021

** Additional product sizes are available.

Phusion[†] DNA polymerases		
Phusion High-Fidelity DNA Polymerase	100 units	F-530S
Phusion Green High-Fidelity DNA Polymerase	100 units	F-534S
Phusion High-Fidelity PCR Master Mix with HF Buffer	100 rxn	F-531S
Phusion Hot Start II DNA Polymerase	100 rxn	F-549S
Phusion Hot Start II High-Fidelity PCR Master Mix	100 rxn	F-565S
Phusion Green Hot Start II High-Fidelity PCR Master Mix	100 rxn	F-566S
Phusion U Hot Start DNA Polymerase	100 rxn	F-555S
Phusion Site-Directed Mutagenesis Kit	20 rxn	F-541

† Additional product sizes are available.

Product	Quantity	Cat. No.
GeneRuler[‡] ladders		
GeneRuler 50 bp DNA Ladder, ready-to-use	50 µg	SM0373
GeneRuler 100 bp DNA Ladder, ready-to-use	50 µg/ 5 x 50 µg	SM0243/ SM0244
GeneRuler 100 bp Plus DNA Ladder, ready-to-use	50 µg/ 5 x 50 µg	SM0323/ SM0324
GeneRuler 1 kb DNA Ladder, ready-to-use	5 x 50 µg/ 25 x 50 µg	SM0314/ SM0313
GeneRuler 1 kb Plus DNA Ladder, ready-to-use	50 µg/ 5 x 50 µg	SM1334/ SM1333
GeneRuler DNA Ladder Mix, ready-to-use	50 µg/ 5 x 50 µg	SM0334/ SM0333
GeneRuler Express DNA Ladder, ready-to-use	50 µg	SM1553

‡ Additional product formats are available.

FastDigest restriction enzymes		
FastDigest Value Pack (trial sizes of 13 of our most popular restriction enzymes and both colorless and green 10x FastDigest buffers)	20 rxn	K1991

For a complete list of the 176 FastDigest enzymes, visit thermofisher.com/fastdigest

PCR/qPCR plastics		
VersiPlate PCR Strip Tube Plate, 96-well	25 plates	AB1800
VersiCap Mat, 96-well	25 mats	AB1810
Adhesive PCR Plate Seals	100 sheets	AB0558
Armadillo PCR Plate, 96-well	25 plates	AB2396
Armadillo PCR Plate, 384-well	50 plates	AB2384
EasyStrip Plus Tube Strip with Attached Flat Caps	250 strips	AB2000
EasyStrip Plus Tube Strip with Attached Ultra Clear Caps	250 strips	AB2005

PCR/qPCR Plastics Selection Tool

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