# Maxima H Minus Reverse Transcriptase

## Engineered to impress

Thermo Scientific™ Maxima™ H Minus Reverse Transcriptase enables consistent success in cDNA synthesis in RT-PCR and RT-qPCR applications. Developed through molecular evolution, with the introduction of multiple favorable mutations into wild-type Moloney murine leukemia virus (M-MuLV) reverse transcriptase, the enzyme delivers impressive thermostability, processivity, and cDNA synthesis rates.

### Why use Maxima H Minus Reverse Transcriptase?

Maxima H Minus Reverse Transcriptase is an enzyme with significantly increased thermostability, enhanced processivity, and diminished RNase H activity. Due to these improved features, the enzyme consistently produces high yields of full-length cDNA even at elevated temperatures. The enzyme is available as a stand-alone enzyme or formulated for convenient kits to support different needs for first-strand cDNA synthesis.

### Features

- High yields of cDNA over a wide temperature range (up to 65°C) (Figure 1)
- Efficient RT-PCR even with extremely long amplification targets (up to 20 kb) (Figure 2)
- Enhanced linearity, sensitivity, and early $C_t$ in two-step RT-qPCR (Figure 3)
- Multiple formats, from stand-alone enzyme to first-strand cDNA synthesis kit, double-stranded cDNA synthesis kit, and one-tube reverse transcription (RT) master mix

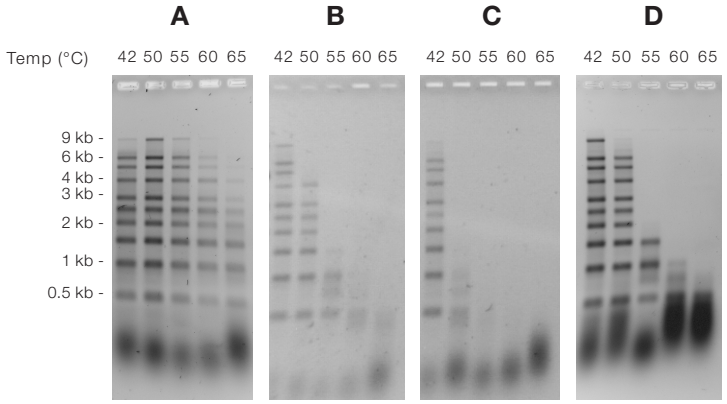


**Figure 1. Maxima H Minus Reverse Transcriptase generates full-length cDNA at a wider range of reaction temperatures than reverse transcriptases from other suppliers.** cDNA synthesis using 1 µg of Invitrogen™ Millennium™ RNA Markers (poly(A)-tailed) with an oligo(dT)$_{18}$ primer was performed with **(A)** Maxima H Minus Reverse Transcriptase; and reverse transcriptases from other suppliers: **(B)** TaKaRa™ PrimeScript™ Reverse Transcriptase, **(C)** Promega™ GoScript™ Reverse Transcriptase, and **(D)** NEB™ ProtoScript™ II Reverse Transcriptase, at different temperatures per suppliers' instructions. The optimal temperatures are 50°C for Maxima H Minus Reverse Transcriptase and 42°C for reverse transcriptases from other suppliers. cDNA products were detected by alkaline gel electrophoresis.

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## Technical details

- Supports a wide range of starting total RNA amounts (1 pg–2.5 µg)
- Can synthesize RNA at elevated temperatures (42–65°C)
- RT reaction can be completed in only 15–30 minutes
- Up to 50x higher processivity compared with wild-type M-MuLV reverse transcriptase enzyme
- Demonstrates template-switching activity
- Capable of incorporating modified nucleotides

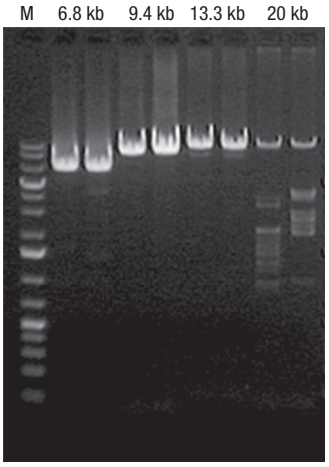


**Figure 2. Two-step long RT-PCR from RNA transcripts up to 20 kb.** Total RNA was extracted from human and mouse cells and used to reverse-transcribe 6.8 kb and 9.4 kb transcripts from the human RNA, and 13.3 kb and 20 kb transcripts from the mouse RNA, using 1 µg of total RNA per reaction and Maxima H Minus Reverse Transcriptase. The synthesized cDNAs were used as templates for PCR, and the PCR products were visualized by gel electrophoresis. M: Thermo Scientific™ GeneRuler™ 1 kb Plus DNA Ladder.

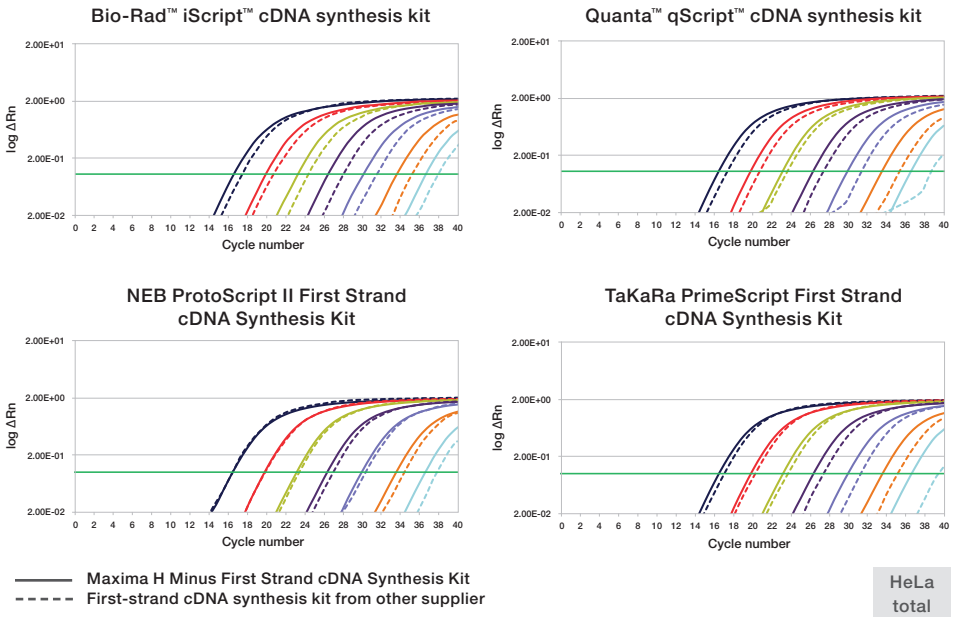


**Figure 3. The Thermo Scientific™ Maxima™ H Minus First Strand cDNA Synthesis Kit demonstrates consistently better RT efficiency than that obtained with other suppliers' kits.** RT-qPCR of the human $\beta_2$ macroglobulin gene was performed on 10-fold serial dilution of 1 µg–1 pg of total RNA from HeLa cells. First-strand cDNA was generated using the Maxima H Minus First Strand cDNA Synthesis Kit and four other commercial first-strand cDNA synthesis kits. cDNA was amplified using Applied Biosystems™ TaqMan® Universal Master Mix II with uracil *N*-glycosylase (UNG), on the Applied Biosystems™ ViiA™ 7 Real-Time PCR System.

## Ordering information

| Product | Quantity | Cat. No. |
|---|---|---|
| Maxima H Minus Reverse Transcriptase | 2,000 U | EP0751 |
| | 10,000 U | EP0752 |
| | 4 x 10,000 U | EP0753 |
| Maxima H Minus First Strand cDNA Synthesis Kit | 20 rxns/100 rxns | K1651/K1652 |
| Maxima H Minus First Strand cDNA Synthesis Kit, with dsDNase | 20 rxns/100 rxns | K1681/K1682 |
| Maxima H Minus Double-Stranded cDNA Synthesis Kit | 10 rxns | K2561 |
| Maxima H Minus cDNA Synthesis Master Mix | 50 rxns/200 rxns | M1661/M1662 |
| Maxima H Minus cDNA Synthesis Master Mix, with dsDNase | 50 rxns/200 rxns | M1681/M1682 |

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

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