

ROUTINE AMPLIFICATION

Routine PCR Selection Guide

Catalog Number	Product Description	Easy MgCl ₂ Optimization ^a	Direct Load ^b	Includes Separate dNTP mix ^c	Assembled Master Mix ^e	Amplification Length ^f	Page
D1806	Taq DNA Polymerase					0.1 to >3 (5) kb	3
D4545	Taq DNA Polymerase without MgCl ₂	✓				0.1 to >3 (5) kb	3
D5938	Taq DNA Polymerase SuperPak			✓		0.1 to >3 (5) kb	5
D5813	Taq DNA Polymerase SuperPak without MgCl ₂	✓		✓		0.1 to >3 (5) kb	5
D4309	REDTaq DNA Polymerase		✓			0.1 to >3 (5) kb	4
D6063	REDTaq DNA Polymerase SuperPak		✓	✓		0.1 to >3 (5) kb	5
P4600	ReadyMix Taq PCR Reaction Mix				✓	0.1 to >3 (5) kb	5
P4475	ReadyMix Taq PCR Reaction Mix without MgCl ₂	✓			✓	0.1 to >3 (5) kb	5
R2523	REDTaq ReadyMix PCR Reaction Mix with MgCl ₂		✓		✓	0.1 to >3 (5) kb	5

- a) Two values are provided for the higher lengths obtained in routine and long PCR. The first value provided is for complex genomic targets and the number in parentheses is routinely achieved with less complicated targets such as plasmid or lambda phage DNA.
- b) REDTaq products contain an inert red dye. The dye provides visual confirmation that the polymerase has been added to the reaction and mixing is complete. Aliquots from the PCR can be directly loaded onto the gel without adding loading buffers or tracking dyes. The dye has no effect on automated DNA sequencing, ligation, transformation or other downstream applications.
- c) SuperPaks are convenient packages containing our high quality Taq or REDTaq DNA Polymerase, 10 mM ultrapure dNTP mix, and 10× reaction buffer with or without MgCl₂.
- d) CORE1 Kit contains all components necessary for routine amplification including 10× PCR Buffer, 10× PCR Buffer without MgCl₂, MgCl₂, PCR grade water, and dNTP mix. CORET Kit contains the same components with the addition of DNA Taq Polymerase.
- e) Each ReadyMix is conveniently supplied at 2× concentration and prepared using the indicated thermostable DNA Polymerase, ultrapure 99%+ dNTPs and high quality molecular biology reagents. To prepare a 50 μl PCR reaction, add 25 μl of the appropriate ReadyMix to 25 μl of water containing primers and template.
- f) Two values are provided for the indicated amplification length. The range provided refers to the average length achieved from complex genomic targets, while the number in parentheses refers to lengths routinely achieved with less complicated targets such as plasmid or lambda phage DNA.

Taq DNA Polymerase

from *Thermus aquaticus*

Taq DNA Polymerase is a specialized thermostable enzyme isolated from the thermophilic bacterium *Thermus aquaticus* (Taq). The recombinant form of this enzyme is expressed in *E. coli* as a 94 kDa protein and shows no detectable levels of contaminating endonucleases or exonucleases by SDS-PAGE. Taq DNA Polymerase has both 5'→3' polymerase and exonuclease activity.

Taq DNA Polymerase comes with the choice of an optimized 10× reaction buffer including MgCl₂ or a 10× reaction buffer without MgCl₂ plus a separate tube of MgCl₂ for titration. The latter may be necessary to determine optimal conditions for amplification.

Features and Benefits

- No detectable levels of contaminating endonucleases or exonucleases by SDS-PAGE
- Suitable for use in PCR amplification and automated sequencing reactions²

Components: Taq DNA Polymerase
10× PCR Buffer without MgCl₂
Vial of 25 mM MgCl₂

Unit definition: One unit will incorporate 10 nmol of total dNTPs into acid-precipitable DNA in 30 min at 74 °C

Concentration: 5 units per μl

Storage: -20 °C
Shipped in wet ice

References

1. Innis, M.A. et al., *Proc. Natl. Acad. Sci. USA* **85**, 9436 (1988).
2. Innis, M.A. et al., *PCR Protocols: A Guide to Methods and Applications*, (Innis, M.A., et al. eds.), Academic Press (1990).

Cat. No.	Product Description	Quantity
D1806	Taq DNA Polymerase with 10× reaction buffer containing MgCl ₂	50 units 250 units 1,500 units 5,000 units 20 x 250 units 10 x 1500 units
D4545	Taq DNA Polymerase with 10× reaction buffer (without MgCl ₂). Includes a separate tube of 25 mM MgCl ₂	50 units 250 units 1,500 units 5,000 units 20 x 250 units

ROUTINE AMPLIFICATION

REDTaq® DNA Polymerase

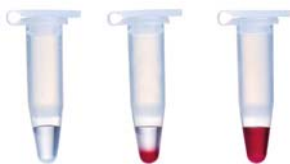
REDTaq DNA Polymerase is a unique blend of Sigma's high quality Taq DNA Polymerase with an inert red dye. This dye enables quick visual confirmation of enzyme addition and reaction mixing. An aliquot of the samples (5-10 μ l) can then be loaded directly onto an agarose gel for electrophoresis following PCR. The red dye migrates slightly faster than bromophenol blue at about the same rate as a 125 base pair fragment in a 1% agarose gel. Since no additional loading buffers are added to the reaction following PCR, reamplification is possible.

The red dye has no effect on automated or manual sequencing, restriction digestions or other downstream applications. Removing the dye can easily be accomplished using any standard purification method.

Features and Benefits

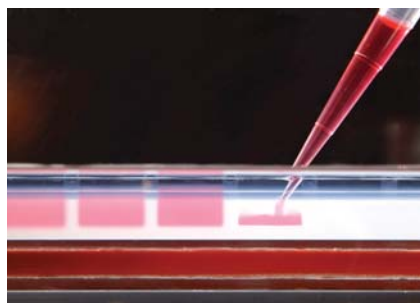
- Same great performance as Taq DNA Polymerase in a more convenient format for high throughput applications
- Visual confirmation that enzyme has been added and proper mixing has occurred
- No additional loading dyes are necessary. An aliquot can be taken directly from the reaction and loaded onto an agarose gel for electrophoresis

Quick Recognition and Confirmation of Appropriate Mixing



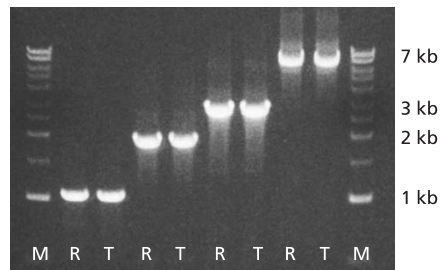
Vial 1 contains no REDTaq, vial 2 has 2.5 units of REDTaq added to a 50 μ l reaction volume, and vial 3 shows a REDTaq PCR reaction solution thoroughly mixed.

No Loading Buffers or Tracking Dyes Required



Samples may be added directly to an agarose gel after PCR without the addition of a loading buffer or tracking dye. The dye in REDTaq acts as a tracking dye migrating at approximately the same rate as a 125 bp fragment.

Same Great Performance as Standard Taq



Comparison of yield for 1, 2, 3, and 7 kb DNA fragments using REDTaq (R) and standard Taq (T) DNA polymerases under identical PCR cycling conditions.

Components: REDTaq DNA Polymerase
10 \times REDTaq PCR Reaction Buffer

Unit definition: One unit incorporates 10 nmol of total dNTPs into acid-precipitable DNA in 30 min at 74 $^{\circ}$ C

Concentration: 1 unit per μ l

Storage: -20 $^{\circ}$ C
Shipped in wet ice

Cat. No.	Product Description	Quantity
D4309	REDTaq DNA Polymerase with 10 \times reaction buffer containing MgCl ₂	50 units 250 units 1,000 units 2,500 (10 x 250) units

ROUTINE AMPLIFICATION

ReadyMix™ Taq PCR Reaction Mix

ReadyMix Taq PCR Reaction Mix is a prepared solution containing all necessary components for a PCR reaction except the specific primers and template. The mix includes Sigma's high quality Taq DNA Polymerase, 99% pure deoxynucleotides and buffer in a 2× optimized reaction concentrate. For reaction set-up, add the ReadyMix (25 µl) to the primers, template and water (total volume 50 µl). Using ReadyMix Taq PCR Reaction Mix reduces pipetting steps and risk of contamination. This saves time and reduces errors while providing the same great performance of Sigma's Taq DNA Polymerase.

Features and Benefits

- Amplifies targets up to 7 kb in length
- ReadyMix Taq PCR Reaction Mix is provided either with or without MgCl₂. A separate vial of 25 mM MgCl₂ is provided for optimization with the ReadyMix without MgCl₂. Both mixes are supplied with a vial of PCR-grade water for dilution
- ReadyMix Taq PCR Reaction Mix offers the same great performance as Taq DNA Polymerase in a more convenient design
- REDTaq ReadyMix PCR Reaction Mix combines all the advantages of a ReadyMix with the added convenience of a direct load system. After PCR, an aliquot can be removed from the reaction and loaded directly onto an agarose gel without the need for loading buffer or tracking dye, making it ideal for high throughput applications

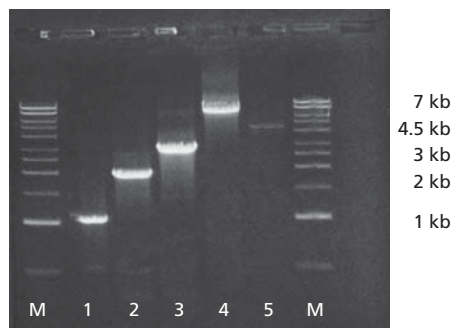
Taq SuperPak™ DNA Polymerase

Taq SuperPaks are conveniently packaged to include all components necessary for PCR except for specific primers, template and water. Also available with REDTaq DNA Polymerase.

Each set includes:

- Taq DNA Polymerase supplied at 5 units/µl
- REDTaq DNA Polymerase supplied at 1 unit/µl
- Optimized 10× Reaction Buffer available with or without MgCl₂. A separate tube of 25 mM MgCl₂ is included with the 10× Buffer not containing MgCl₂
- Ultrapure dNTP mix containing 10 mM each of ultrapure dATP, dCTP, dGTP and TTP in molecular biology grade water. The dNTP mixture is suitable for use in routine and specialized (long and accurate) PCR, manual and automated sequencing, RT-PCR and cDNA synthesis reactions, DNA labeling and mutagenesis reactions

Excellent Amplification with ReadyMix Taq PCR Reaction Mix



Amplification of 1, 2, 3, and 7 kb fragments and a 4.5 kb human genomic DNA using ReadyMix Taq PCR Reaction Mix.

Unit definition: One unit incorporates 10 nmol of total dNTPs into acid-precipitable DNA in 30 min at 74 °C

Concentration: 1.5 units per 50 µl reaction

Storage: –20 °C
Shipped in wet ice

Cat. No.	Product Description	Quantity
P4600	ReadyMix Taq PCR Reaction Mix	20 reactions 100 (5 x 20) reactions
P4475	ReadyMix Taq PCR Reaction Mix without MgCl ₂	20 reactions 100 (5 x 20) reactions
R2523	REDTaq ReadyMix PCR Reaction Mix	20 reactions 100 (5 x 20) reactions

Unit definition: One unit will incorporate 10 nmol of total dNTPs into acid-precipitable DNA in 30 min at 74 °C

Storage: –20 °C
Shipped in wet ice

Cat. No.	Product Description	Quantity
D5938	Taq SuperPak DNA Polymerase	50 units 250 units 1,500 units
D5813	Taq SuperPak DNA Polymerase without MgCl ₂	50 units 250 units 1,500 units
D6063	REDTaq SuperPak DNA Polymerase	50 units 250 units