



5 PRIME

Manual *Taq* DNA Polymerase

For standard PCR with minimal PCR optimization

Trademarks: *MasterTaq*[™] is a registered Trademark of 5 PRIME GmbH; Tween® and IGEPAL® are registered Trademarks of ICI Americas, Inc. and Shell Petroleum Company Limited, UK, respectively

© 2007 5 PRIME, all rights reserved.

Contents

Contents	3
Introduction	4
Precautions and warnings	4
Materials	4
Storage and stability	5
Quality assurance	5
Enzyme concentration	5
Associated activities	5
Buffer composition	5
Protocol	6
Ordering information	7
5 PRIME Distributors	8

Introduction

5 PRIME *Taq* DNA Polymerase is a recombinant enzyme purified from *Escherichia coli* DH1. It is supplied with a 10x buffer formulated to automatically adjust the Mg^{2+} concentration, eliminating the need to optimize this critical component.

Self-adjusting magnesium buffer

During a PCR reaction, the required free magnesium ion concentration is dependent on multiple factors such as the amount of template DNA, dNTPs, primers, amplicon, enzymes, and the reaction kinetics. Determining the optimal concentration for a PCR target may therefore require considerable effort.

5 PRIME's advanced buffer technology automatically adjusts the concentration of magnesium ions to the specific demands of the individual reaction. The *Taq* DNA Polymerase 10x reaction buffer contains a component that weakly chelates Mg^{2+} ions. When Mg^{2+} is present in the reaction in excess, the ions remain bound to the chelating agent. As Mg^{2+} demands increase throughout PCR, the chelating agent releases magnesium ions, providing optimal reaction conditions. The maximum capacity of this buffer is up to 2.0 mM Mg^{2+} ; however, additional magnesium can be added if required by specific applications.

Precautions and warnings

Appropriate safety apparel such as lab coat, gloves, and eye protection should be worn. For more information, please consult the appropriate material safety data sheets which are available for this kit online at www.5PRIME.com/msds.

Materials

Materials supplied in the kits

Component	100 U	250 U	1000 U	5000 U = 5 x 1000 U
<i>Taq</i> DNA Polymerase (5 U/ μ l)	20 μ l	50 μ l	4 x 50 μ l	20 x 50 μ l
10x <i>Taq</i> Buffer advanced	1 x 1.8 ml	1 x 1.8 ml	3 x 1.8 ml	15 x 1.8 ml
25 mM Magnesium Solution	1 x 1.5 ml	1 x 1.5 ml	2 x 1.5 ml	10 x 1.5 ml

Materials required but not supplied

- Template DNA
- dNTPs*
- PCR tubes and plates
- Primers
- Molecular Biology Grade Water*
- PCR clean tips

*5 PRIME products

Storage and stability

Store at -20°C in a constant temperature freezer. If stored as recommended, the kit is stable at least until the expiration date on the label.

Quality assurance

Each lot of *Taq* DNA Polymerase is tested for functionality, yield and specificity in PCR. A Certificate of Analysis is available for this kit online at www.5PRIME.com/certificates.

Enzyme concentration

The *Taq* DNA Polymerase enzyme concentration is 5 U/μl*

*One unit is defined as the amount that incorporates 10 nmoles of dNTPs into acid insoluble form in 30 minutes at 74°C under the assay conditions, using reaction conditions: 25 mM TAPS (N-tris-(hydroxy- methyl)-methyl-3-amino-propanesulfonic acid, sodium salt) pH 9.3 (at 25°C); 50 mM KCl; 2 mM Mg(OAc)₂; 1 mM β-mercaptoethanol; 200 μmole each dATP, dGTP, dTTP; 100 μM dCTP (a mix of unlabeled and [α-32P]-labeled); 12.5 μg activated salmon sperm DNA in a final volume of 50 μl.

Associated activities

The recombinant 5 PRIME *Taq* DNA Polymerase possesses a 5′–3′ DNA-dependent DNA polymerase activity and the intrinsic 5′–3′ exonuclease activity of the native *Taq* DNA polymerase from *Thermus aquaticus*. The extension rate of the DNA polymerase activity ranges from 30 to 60 bp per second depending on the complexity of template DNA used in the reaction.

Buffer composition

Enzyme storage buffer:

20 mM Tris-HCl pH 8.0 (at 25°C), 100 mM KCl, 0.1 mM EDTA, 1 mM DTT, 50% glycerol, 0.5% Tween® 20, 0.5% Igepal® CA-630

Protocol

Mix the following components in a thin-walled PCR tube:

Component	Volume	Final concentration
Molecular Biology Grade Water	variable	
10x <i>Taq</i> Buffer advanced	5 μ l	1x
10 mM dNTP Mix	1 μ l	0.2 mM
Forward Primer	variable	0.1 – 0.2 μ M
Reverse Primer	variable	0.1 – 0.2 μ M
Template DNA	variable	1 – 150 ng
<i>Taq</i> DNA Polymerase (5 U/ μ l)	0.2 – 2.5 μ l	1.0 – 2.5 U
Total volume	50 μ l	

- 10x *Taq* Buffer advanced is suitable for standard applications. For sensitive applications (e.g. template amounts below 100 pg), it may be necessary to increase the magnesium concentration.
- Individual reaction conditions (temperatures and times, concentrations of template DNA, primers, and enzyme) need to be determined based on the PCR system.
- The recommended synthesis temperature for the primer elongation step in a PCR cycle is 68°C in an allowed range of 60°C to 72°C. Historically, 72°C has been the common temperature used for standard *Taq* DNA Polymerase elongation; however, current research has shown that 68°C is optimal.

Ordering information

Product	Package Size	Catalog No.
<i>Taq</i> DNA Polymerase	100 U	2200000
<i>Taq</i> DNA Polymerase	250 U	2200010
<i>Taq</i> DNA Polymerase	1000 U	2200020
<i>Taq</i> DNA Polymerase	5000 U	2200030
Master <i>Taq</i> TM Kit	100 U	2200200
Master <i>Taq</i> TM Kit	250 U	2200210
Master <i>Taq</i> TM Kit	500 U	2200220
Master <i>Taq</i> TM Kit	1000 U	2200230
5 PRIME MasterMix	100 Rxns	2200100
5 PRIME MasterMix	1000 Rxns	2200110
Deoxynucleotide Mix - 10 mM	200 µl	2201200
Deoxynucleotide Mix - 10 mM	1000 µl	2201210
Deoxynucleotides Set	4 x 100 µl	2201220
Deoxynucleotides Set	4 x 250 µl	2201230
10 x <i>Taq</i> Buffer, with 15 mM Magnesium	1.8 ml	2201240
5x <i>Taq</i> Master PCR Enhancer	1.7 ml	2201250
Water, Mol Bio grade	1 l	2500000
Water, Mol Bio grade	10 x 50 ml	2500010
Water, Mol Bio grade	5 l	2500020

5 PRIME Distributors

Australia

Quantum Scientific
30 Finchley Street
Milton Qld 4064
P.O. Box 166
Paddington Queensland 4064
Phone: +61-7-3369-9544
Fax: +61-7-3368-1802
E-Mail: sales@quantum-scientific.com.au
Web: www.quantum-scientific.com.au

Austria

Schott Lab Technology GmbH
Brünner Straße 73
1210 Wien
Phone: +43-1-29017560
Fax: +43-1-290175620
E-Mail: info.austria@schott.com
Web: http://www.schott-labtech.com

VWR International GmbH
Graumannsgasse 7
1150 Wien
Phone: +43-1-97-002-328
E-Mail: bioMarke@vwr.com
Web: http://at.vwr.com
Contact person: Brigitte Niebler

Belgium

VWR International BVBA / SPRL
Haasrode Researchpark Zone 3
Geldenaaksebaan 464
B-3001 Leuven
Phone: +32-16-385-265
E-Mail: bioMarke@vwr.com
Web: http://be.vwr.com
Contact person: Nico Van Stallen

Bosnia Herzegovina

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Brazil

A distributor will soon be available in your country. Please visit our website www.5Prime.com

Bulgaria

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Canada

Inter Medico
50 Valleywood Drive
Markham, Ontario L3R 6E9, Canada
Toll free: Toll Free (English): +1-800-387-9643
Toll free: Sans Frais (Français): +1-800-268-1150
Phone: +1-905-470-2520
Fax: +1-905-470-2381
E-Mail: mshackleton@inter-medico.com or info@inter-medico.com
Web: http://www.inter-medico.com

Croatia

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Czech Republic

MEDESA s.r.o.
Na Vysehradě 1092
572 01 POLICKA
Phone: +420-461-723-555 (559)
Fax: +420-461-723-560
E-Mail: medesa@medesa.cz
Web: www.medesa.cz

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Denmark

VWR International ApS
Valhøjs Allé 174-176
2610 Rødovre
Phone: +45-21-22-37-60
E-Mail: bioMarke@vwr.com
Web: http://dk.vwr.com
Contact person: Nikolaj Schmolker

Estonia

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Finland

VWR International Oy
Pihatörmä 1 C 1
FI - 02240 Espoo
Phone: +358-9-804-55-209
E-Mail: bioMarke@vwr.com
Web: http://fi.vwr.com
Contact person: Leena Kontola-Kuusisto

France

Dominique Dutscher SA
30, rue de l'Industrie
P.O. Box 52
67172 Brumath Cedex
Phone: +33-3-88-59-33-90
Fax: +33-3-88-59-33-99
E-Mail: info@dutscher.com
Web: www.dutscher.com

VWR International S.A.S.
"Le Périgères" - Bâtiment B
201, rue Carnot
F-94126 Fontenay-sous-Bois Cedex
Phone: +33-1-45-14-83-43
E-Mail: bioMarke@vwr.com
Web: http://fr.vwr.com
Contact person: Soraya Mezaib

Germany

VWR International GmbH
Hilpertstraße 20a
D-64295 Darmstadt
Phone: +49-6151-3972-442
E-Mail: bioMarke@vwr.com
Web: http://de.vwr.com
Contact person: Matthias Dornheim

Greece

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic
Fax: +44-1159-455-379
E-Mail: flowgen@flowgen.co.uk
Web: www.Flowgen.co.uk

Great Britain

FLOWGEN
Wilford Industrial Estate
Ruddington Lane
Nottingham, NG11 7EP
Phone: +44-1159-775-494

VWR International
Hunter Boulevard
Magna Park
Lutterworth, Leicestershire LE17 4XN
Phone: +44-77-694-624-42
E-Mail: bioMarke@vwr.com
Web: uk.vwr.com
Contact person: Becky Upton

Hungary

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

India

Eppendorf India Limited
Doshi Towers, 4th Floor
156, Poonamallee High Road
Kilpauk, Chennai 600010
Phone: +91-44-42-11-13-14 / 42-11-13-41
Fax: +91-44-42-18-74-05
E-Mail: info@eppendorf.co.in
Web: www.eppendorf.co.in

Ireland

Isis
Ballywaltrim Business Centre
Boghail Road
Bray
Co. Wicklow
Phone: +353-1-286-7777
Fax: +353-1-286-7766
E-Mail: enquiries@isis.co.ie
Web: www.isis.co.ie

AGB Scientific Ltd.
(a VWR International Company)
136 Slaney Rd
Dublin Industrial Estate
Dublin 11
Phone: +353-01-88-22-379
E-Mail: bioMarke@vwr.com
Web: http://ie.vwr.com
Contact person: Ulrika Jansson

Israel

Zotal Ltd
Habazrel 4
Tel-Aviv 69710
Israel
Phone: +972-3-6492444
Fax: +972-3-6495664
E-Mail: sales@zotal.co.il
Web: www.zotal.co.il

Italy

Eppendorf s.r.l.
Via Zante 14
20138 Milano
Phone: +39-02-55-40-41
Fax: +39-02-59-013-438
E-Mail: eppendorf@eppendorf.it
Web: www.eppendorf.it

Latvia

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Lithuania

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Luxembourg

VWR International BVBA / SPRL
Haasrode Researchpark Zone 3
Geldenaaksebaan 464
B-3001 Leuven
Phone: +32-16-385-265
E-Mail: bioMarke@vwr.com
Web: http://be.vwr.com
Contact person: Nico Van Stallen

New Zealand

Global Science and Technology
241 Bush Road
Albany 0632
Auckland
Phone: +64-9-443-5867
Fax: +64-9-444-7314
E-Mail: global@globalscience.co.nz
Web: www.globalscience.co.nz

Netherlands

VWR International B.V.
Postbus 8198
NL-1005 AD Amsterdam
Phone: +31-20-4800-3640
E-Mail: bioMarke@vwr.com
Web: http://nl.vwr.com
Contact person: Esther Koormeef

Norway

VWR International AS
Kakkelovnskroken 1
P.B. 45, Kalbakken
NO-0901 Oslo
Phone: +47-908-236-78
E-Mail: bioMarke@vwr.com
Web: http://no.vwr.com
Contact person: Nina Nielsen Bjerke

Poland

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

Portugal

F5G (Grupo Hucosa Erloß)
Edifício EURO
Rua Pedro Álvares Cabral, 24, 3º D
2760-391 Infanzado
Phone: +351-21-425-3350
Fax: +351-21-425-3351
E-Mail: achambel@hucosa-erloss.com
Web: www.f5g.pt

VWR International LDA, Portugal
Rua Alfredo da Silva - 3C
1300-040 Lisboa
Phone: +351-968-753-414
E-Mail: bioMarke@vwr.com
Web: http://pt.vwr.com
Contact person: Rui Henriques

Romania

VWR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacic@vwr.com
Web: www.vwr.com
Contact person: Roman Kovacic

5 PRIME Distributors

Serbia & Montenegro

WVR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacik@vvr.com
Web: www.vvr.com
Contact person: Roman Kovacik

Sweden

WVR International
Fagerstagatan 18 A, Spånga
SE-163 94 Stockholm
Phone: +46-708-2138-37
E-Mail: bioMarke@vvr.com
Web: http://se.vvr.com
Contact person: Lars Söderlund

Switzerland

WVR International AG
Lerzenstrasse 16/18
CH-8953 Dietikon
Phone: +41-44-745-14-77
E-Mail: bioMarke@vvr.com
Web: http://ch.vvr.com
Contact person: Leila Bouhraoua

Slovakia

WVR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacik@vvr.com
Web: www.vvr.com
Contact person: Roman Kovacik

Slovenia

WVR International o.z.
Prievozska 6
821 09 Bratislava
Slovakia
Phone: +421-2-326-601-31
E-Mail: roman_kovacik@vvr.com
Web: www.vvr.com
Contact person: Roman Kovacik

Spain

HUCOA ERLÖSS
C/Luis I No. 9
Edificio Hucoa
28031 Madrid
Phone: +34-91-380-67-10
Fax: +34-91-380-85-02
E-Mail: atc@hucoa-erloss.com
Web: www.hucoa-erloss.com

WVR International Eurolab S.L.
Apartado 48
E-08100 Mollet del Valles
Phone: +34-660-398-304
E-Mail: bioMarke@vvr.com
Web: http://es.vvr.com
Contact person: Monica Galiana

Thailand

Mondotech (Thailand) Co. Ltd.
88 Krungthepkreetha Rd.
Huamark, Bangkok
Bangkok 10240
Phone: +66-2-379-4212-5
Fax: +66-2-379-4216
E-Mail: mondote@asianet.co.th
Contact person:
Mr. Tosphon Pruchyathamkorn or
Ms. Yalada Chullakasev

USA

Fisher Scientific Company, LLC
Phone: +1-800-766-7000
Fax: +1-800-926-1166
Web: www.fishersci.com

For all other countries

Visit our website www.5Prime.com
or contact us

5 PRIME GmbH
Königstr. 4a
22767 Hamburg
Germany
Phone: +49-40-3197-927427

5 PRIME Inc.
111 Bucksfield Road
Gaithersburg, MD 20878
US
Phone: +1-240-683-3905

1044357