

Combination Buffer (15 mM MgCl₂)

Conc.: 10x Buffer

Cat. No.: 733-1352



Cat. No.	10x Combination Buffer 15 mM MgCl ₂
ID No. Cap colour	5600400 Green
733-1352	3 x 1.5 ml

Store at -20 °C

General Description

VWR offers 3 different buffers to allow the customer to choose the optimal buffer system for a specific amplification process. VWR Buffers are usually supplied in 10x formulations with 15 mM MgCl₂ included but are also available as Mg²⁺ free buffers, detergent free buffers as well as Mg²⁺ and detergent free buffers.

Key Buffer

Composition: Tris-HCl pH 8.5, (NH₄)₂SO₄, 15 mM MgCl₂*, 1% Tween® 20*. Buffers including ammonium (NH₄⁺) usually give a superior amplification signal (high yield) in many primer-template systems (figure 1). Ammonium in the buffer minimizes the need for optimization of the MgCl₂ concentration or the annealing temperature for most primer-template systems.

Extra Buffer

Composition: Tris-HCl pH 8.5, KCl, 15 mM MgCl₂*, 1% Triton X-100*. Extra Buffer is the traditional potassium (K⁺) buffer. Extra Buffer promotes high specificity (figure 1) and careful optimization of primer annealing temperatures may be required.

Combination Buffer

Composition: Tris-HCl pH 8.7, KCl, (NH₄)₂SO₄, 15 mM MgCl₂*, 1% Tween® 20*. Combination Buffer is a proprietary mixture of K⁺ and NH₄⁺. This buffer combines high specificity with good product yield and high tolerance to optimization of primer annealing temperatures and Mg²⁺ concentrations due to its balanced ammonium-potassium formulation.

Magnesium

Mg²⁺ is required for polymerase activity. Low Mg²⁺ concentrations increase the fidelity but with too low Mg²⁺ concentrations the polymerase will not work. The Mg²⁺ concentration available in the reaction is dependent on several parameters e.g. the presence of chelators or the dNTP concentration. Therefore the Mg²⁺ concentration should be optimized.

Tween, Triton

Non-ionic detergents are used to prevent the polymerase to stick to the walls of the tube, to stabilize the polymerase and increase yield. However, these agents might increase non-specific amplification or interfere with downstream reactions.

* optional without Mg²⁺ and/or Tween® 20/Triton X-100

Version: VWR 10/2019

Made in Denmark

Tween can be used to neutralize SDS contaminations in the DNA template.

Recommended Storage and Stability

Long term storage at -20 °C. Product expiry at -20 °C is stated on the label.

Option: Store at +4 °C for up to 6 months.

Quality Control

Each lot of buffer is functionally tested in PCR.

Kit Components

10x Combination Buffer

Tris-HCl pH 8.7, KCl, (NH₄)₂SO₄, 15 mM MgCl₂,

1% Tween® 20.

Determining the optimal buffer system for your application

By running three reactions using the three VWR buffers, the optimal reaction conditions should be found for the specific application. The final concentration of the buffer in the reaction should be 1x.

1. 1x Key Buffer
2. 1x Extra Buffer
3. 1x Combination Buffer (not shown in the figure)

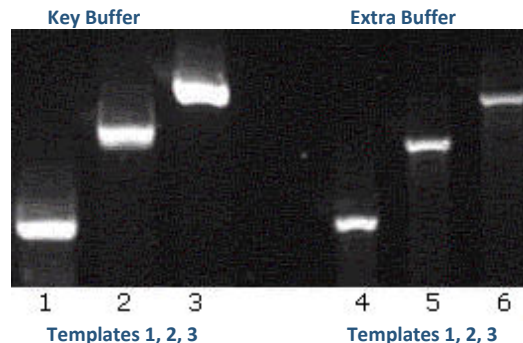


Figure 1: Amplification of three different cDNA templates using Key Buffer versus Extra Buffer.

Optimising the Mg²⁺ concentration

In some applications, optimization of MgCl₂ is required for best results. For this reason, 25 mM MgCl₂ is included in all buffer kits. Table 1 provides the volume of 25 mM MgCl₂ to be added to the master mix using the VWR buffer kit, if a higher MgCl₂ concentration is required.

Table 1. Additional volume (µl) of MgCl₂ per 50 µl reaction using a 10x Buffer including 15 mM MgCl₂

Final MgCl ₂ conc. in reaction (mM)	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Volume of 25 mM MgCl ₂	0	1	2	3	4	5	6

When using Mg²⁺ free buffers, the addition of MgCl₂ is imperative. Table 2 provides the volume of 25 mM MgCl₂ to be added to the master mix using Mg²⁺ free buffers.

Table 2. Additional volume (µl) of MgCl₂ per 50 µl reaction using a Mg²⁺ free 10x Buffer

Final MgCl ₂ conc. in reaction (mM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
Volume of 25 mM MgCl ₂	1	2	3	4	5	6	7	8	9

Related Products

Description	Cat. No.
VWR Taq DNA Polymerase	
VWR Glycerol Free Taq DNA Polymerase (1000 units) with 10x Key Buffer with 10x Extra Buffer	733-1817
VWR Taq DNA Polymerase (500 units) with 10x Key Buffer with 10x Extra Buffer	733-1301
VWR Taq DNA Polymerase (500 units) with 10x Extra Buffer (Mg ²⁺ -free and Triton-free)	733-1304
VWR Taq DNA Polymerase (1000 units) with 10x Key Buffer (Tween-free) with 10x Extra Buffer (Triton-free)	733-1307
VWR Taq DNA Polymerase (500 units) with 10x Key Buffer (Mg ²⁺ -free)	733-1311
VWR Red Taq DNA Polymerase (2500 units) with 10x Key Buffer with 10x Extra Buffer	733-1323
VWR Taq DNA Polymerase Master Mix*	
VWR Taq DNA Pol. 1.1x Master Mix, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-1314
VWR Taq DNA Pol. 2x Master Mix, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-1316
VWR Red Taq DNA Pol. 1.1x Master Mix, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-1318
VWR Red Taq DNA Pol. 2x Master Mix, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-1320
VWR TEMPase Hot Start DNA Polymerase	
VWR TEMPase Hot Start DNA Polymerase (500 units) with 10x Key Buffer with 10x Combination Buffer	733-1331
VWR Glycerol Free TEMPase DNA Polymerase (500 units) with 10x Key Buffer	733-2555
VWR TEMPase Hot Start Master Mix**	
VWR TEMPase Hot Start 2x Master Mix K, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-2582
VWR Blue TEMPase Hot Start 2x Master Mix K, 1.5 mM MgCl ₂ final conc. (2500 reactions)	733-2585
VWR Multiplex Master Mix	
VWR Multiplex 2x Master Mix, (2500 reactions)	733-2569
VWR High Fidelity DNA Polymerase	
VWR AccuPOL DNA Polymerase (250 units) with 10x Key Buffer	733-1324
VWR AccuPOL DNA Polymerase (250 units) with 10x Key Buffer (Mg ²⁺ free and Tween free)	733-1328
VWR PCR accessories	
Betaine Enhancer Solution 5 M, 5 ml (500 reactions)	733-1361
dNTP Mix, 40 mM (10 mM of each dATP, dCTP, dGTP & dTTP) (40 µmol, 2x 500 µl)	733-1363
dNTP Set, 100 mM of each dATP, dCTP, dGTP & dTTP (4x 25 µmol, 4x 250 µl)	733-1364
VWR PCR grade water (6 x 5 ml)	733-2573
VWR Loading Buffer Red (5 x 1 ml) – available in 4 different colors	733-2574

*Also available with 2 mM MgCl₂

**Also available as 2x Master Mix C based on Combination Buffer

Tween® 20 is a registered trademark of ICI Americas, Inc.