

## MgCl<sub>2</sub> (25 mM)

MADE IN DENMARK

Cat. No.: A308103



A308103

-	MgCl <sub>2</sub> (25 mM)
ID No.	5575801
Cap Colour	Clear
Content	3 x 1.5 ml

### General Description

Mg<sup>2+</sup> is required for polymerase activity. It binds to the dNTPs and thereby turns them into the proper substrate for the DNA polymerase. Without Mg<sup>2+</sup> bound, the polymerase will not recognize the dNTPs as a substrate and will not work. Mg<sup>2+</sup> is essential in removing the phosphate groups under DNA elongation. Furthermore, Mg<sup>2+</sup> binds to the primers and stabilizes dsDNA, thereby influencing annealing- and melting temperatures.

The Mg<sup>2+</sup> concentration available in the PCR reaction is dependent on several parameters like dNTP concentration, primer purity and concentration, template DNA purity and concentration, the presence of chelators (e.g. EDTA introduced with the template DNA) and the presence and type of fluorescent dye in qPCR. Therefore, the Mg<sup>2+</sup> concentration should be optimized for new PCR reactions as well as when changing one or more parameters of the PCR reaction. Low Mg<sup>2+</sup> concentrations increase the fidelity but decrease the polymerase activity. High Mg<sup>2+</sup> concentration promotes fast DNA amplification on cost of fidelity. Elevated Mg<sup>2+</sup> concentrations stabilize dsDNA, thereby preventing it from complete denaturation and increasing the melting temperature. Because of this stabilizing effect, increased Mg<sup>2+</sup> concentrations support also primer dimer formation and increase annealing temperatures.

### Adjustment of final MgCl<sub>2</sub> concentration

The MgCl<sub>2</sub> concentrations used in PCR range from 0.5 to 5 mM and can be added in the form of various magnesium salts, e.g. MgCl<sub>2</sub> or Mg<sub>2</sub>SO<sub>4</sub>. A good starting concentration in a standard PCR is 1.5 mM MgCl<sub>2</sub>. Tables 1 and 2 give the amount of 25 mM MgCl<sub>2</sub> to be added to a 50 µl reaction without prior presence of Mg<sup>2+</sup> or with 1.5 mM Mg<sup>2+</sup> present.

**Table 1. Additional volume (µl) of MgCl<sub>2</sub> per 50 µl reaction; without prior presence of Mg<sup>2+</sup>**

Final MgCl <sub>2</sub> conc. in reaction (mM)	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Volume of 25 mM MgCl <sub>2</sub>	1	2	3	4	5	6	7	8	9	10

**Table 2. Additional volume (µl) of MgCl<sub>2</sub> per 50 µl reaction; with prior presence of 1.5 mM Mg<sup>2+</sup>**

Final MgCl <sub>2</sub> conc. in reaction (mM)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Volume of 25 mM MgCl <sub>2</sub>	0	1	2	3	4	5	6	7

### 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.

### Kit Components

#### MgCl<sub>2</sub>

25 mM MgCl<sub>2</sub> in PCR-grade H<sub>2</sub>O

### Related Products

Taq DNA Polymerase (500 units) *	Cat. No.
Taq DNA Polymerase 5 U/µl • with 10x Ammonium Buffer • 5x PCR Buffer RED	A110003 A111103 A111803
Taq DNA Polymerase 5 U/µl, RED • with 10x Ammonium Buffer	A200003 A201103
Taq DNA Polymerase 5 U/µl, glycerol free • with 10x Ammonium Buffer	A100003 A101103

Hot Start DNA Polymerase (500 units) *	Cat. No.
TEMPase Hot Start DNA Polymerase, 5 U/µl • with 10x Ammonium Buffer	A220003 A221103

\*Available in kits including one or two buffers (Ammonium Buffer, Standard Buffer or Combination Buffer). All kits include extra 25 mM MgCl<sub>2</sub>.

Buffers for DNA Polymerases *	Cat. No.
10x Ammonium Buffer, 3 x 1.5 ml	A301103
10x Standard Buffer, 3 x 1.5 ml	A302103
10x Combination Buffer, 3 x 1.5 ml	A303103
5x PCR Buffer RED, 6 x 1,5 ml **	A301810
4x GC Buffer I, 3 x 1.5 ml	A301703
4x GC Buffer II, 3 x 1.5 ml	A302703

\*Ammonium Buffer, Standard Buffer and Combination Buffer are also available as Mg<sup>2+</sup> free buffers, detergent free buffers and Mg<sup>2+</sup> and detergent free buffers.  
\*\*For direct gel loading and visualisation.

Ultrapure dNTPs*	Cat. No.
dNTP Mix 40 mM (2 x 500 µl): 10 mM each dA, dC, dG, dT	A502004
dNTP Set, 100 mM each: 250 µl of each dA, dC, dG and dT	A511104

\*Other concentrations and Single dNTPs are available.

Loading Buffers, PCR Water and Ladders	Cat. No.
5x Loading Buffer Red *, 5 x 1 ml	A608104
lqon PCR Ladder **, 100 – 3000 bp, 1 x 0.5 ml	A610341
PCR Grade Water, 6 x 5 ml	A360056

\* Also available with Blue, Orange or Cyan. \*\* Available in different size ranges.

For Research Use Only. Not for use in diagnostics procedures.

Other product sizes, combinations and customized solutions are available. Please look at [www.ampliqon.com](http://www.ampliqon.com) or ask for our complete product list for PCR Enzymes. For customized solutions please contact us.

Made in Denmark  
Issued 08/2021