AMPLIQON
PCR ENZYMES & REAGENTS

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$MgCl_2$

Concentration: 25 mM

MADE IN **DENMARK**

Cat. No.	$MgCl_2$, 25 mM ID: 5575801
A308103	3 x 1.5 ml
A308110	10 x 1.5 ml
A308156	6 x 5 ml

General Description

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

The Mg^{2+} 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^{2+} concentration should be optimized for new PCR reactions as well as when changing one or more parameters of the PCR reaction.
Low Mg^{2+} concentrations increase the fidelity but decrease the polymerase activity. High Mg^{2+} concentration promotes fast DNA amplification on cost of fidelity. Elevated Mg^{2+} concentrations stabilize dsDNA, thereby preventing it from complete denaturation and increasing the melting temperature. Because of this stabilizing effect, increased Mg^{2+} concentrations support also primer dimer formation and increase annealing temperatures.

Adjustment of final $MgCl_2$ concentration

The $MgCl_2$ concentrations used in PCR range from 0.5 to 5 mM and can be added in the form of various magnesium salts, e.g. $MgCl_2$ or Mg_2SO_4. A good starting concentration in a standard PCR is 1.5 mM $MgCl_2$. Tables 1 and 2 give the amount of 25 mM $MgCl_2$ to be added to a 50 µl reaction without prior presence of Mg^{2+} or with 1.5 mM Mg^{2+} present.

Table 1. Additional volume (µl) of $MgCl_2$ per 50 µl reaction; without prior presence of Mg^{2+}

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	5.0
Volume of 25 mM MgCl2	1	2	3	4	5	6	7	8	9	10

Table 2. Additional volume (µl) of $MgCl_2$ per 50 µl reaction; with prior presence of 1.5 mM Mg^{2+}

Final $MgCl_2$ conc. in reaction (mM)	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
Volume of 25 mM $MgCl_2$	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

$MgCl_2$

25 mM $MgCl_2$ in PCR-grade H_2O

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 or ask for our complete product list for PCR Enzymes. For customized solutions please contact us.

Made in Denmark

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