

## Method Z470 – Magnesium Mg fresh water

## Specification

Description:	Test for determining the content of magnesium in fresh water
Range:	3 - 150 mg/l
Resolution:	1 mg/l
Wavelength:	610 nm
Extra feature:	<b>exat:ir</b> method guided by the innovative photometric system for easy and convenient titration, see <a href="#">1.5 Titration method</a> .

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## NOTE:

*Firstly, take a measurement according to the method Z471*

*Purchase this set along with the set for Method Z471, Calcium Ca fresh water (product no 8471). Prior measurement according to the method Z471 is necessary so that the concentration of magnesium is automatically displayed in mg/l as a basic unit.*

*Otherwise, the magnesium content is displayed in the arbitrary unit (A) and can be calculated into mg/l with the equation given in point 9.*

## Reagent set

Product Code	Description	List of components
8470	Set of reagents for method Z470, Magnesium Mg fresh water (reagents for approx. 30 tests)	<ul style="list-style-type: none"> <li>✓ Reagent Ca-Mg-1</li> <li>✓ Reagent Ca-Mg-3</li> <li>✓ Powder Reagent Ca-Mg-2</li> <li>✓ Spatula</li> <li>✓ 1 ml syringe with tip</li> <li>✓ vial</li> </ul>

## Performing the measurement

- Select the **Z470 Magnesium Mg fresh water** method (Methods → Select method → Z470 Magnesium Mg Fresh). How to select the method, see [8.1 Choosing method](#).

## NOTE:

*It is recommended to use the GUIDE system by pressing the context button **GUIDE** on the photometer. It will provide you with step-by step basic instruction how to perform measurement and a timer with beeper to count down reaction time. To enable this function press the button **GUIDE**.*

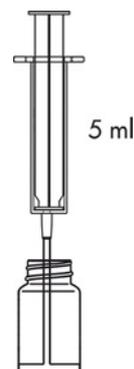
- Rinse the vial and the syringe three times with the tested water.

Take exactly 5 ml of the tested water with the syringe and pour into the vial.

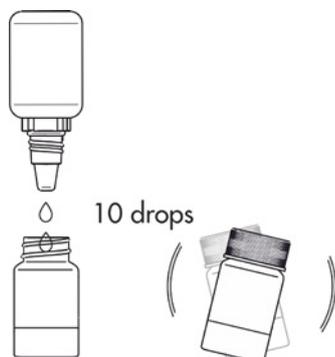
## NOTE:

*Make sure no air bubbles are present in the syringe.*

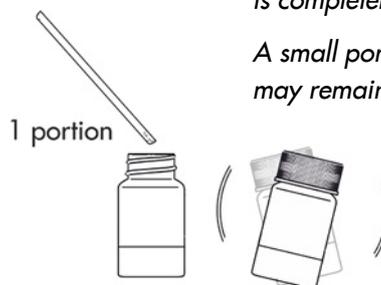
*Trapped air bubbles can affect accuracy of the measurement.*



3. Add 10 drops of **Reagent Ca-Mg-1** and shake to mix.



4. Add 1 portion of **Reagent Ca-Mg-2** with the spatula, shake until the powder has dissolved.

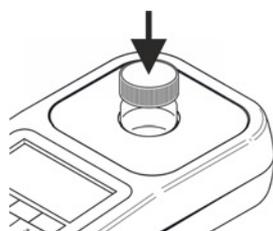


**NOTE!**

Make sure that the spatula is completely filled.

A small portion of sediment may remain undissolved.

5. Insert the vial into the round vial holder and press the **ZERO** key. The display will show **"-0.0-"**, which means the device is ready for measurement.



26 08 20		12:35
Mg	Z470 Magnesium Mg	
	tag 1	
<b>Measuring ...</b>		
ZERO	MEAS	GUIDE

26 08 20		12:35
Mg	Z470 Magnesium Mg	
	tag 1	
<b>-0.0- A</b>		
ZERO	MEAS	GUIDE

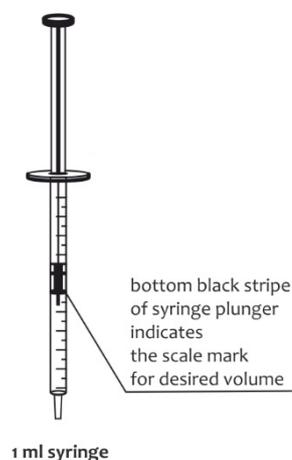
**NOTE:**

Before starting the measurement, it is highly recommended to make sure the test vial is clean and dry. Liquid residues remaining on the vial walls may adversely affect reliability of results.

6. Replace the cap with a hole on the vial. Attach the tip on the end of the 1 ml syringe and take 1 ml of the **Reagent Ca-Mg-3**. The bottom black stripe of the syringe plunger should be on the scale mark for the desired volume, see [18.3.1 Proper use of syringe](#).

**NOTE:**

Make sure no air bubbles are present in the syringe or in the tip. Trapped air bubbles can affect accuracy of the measurement.

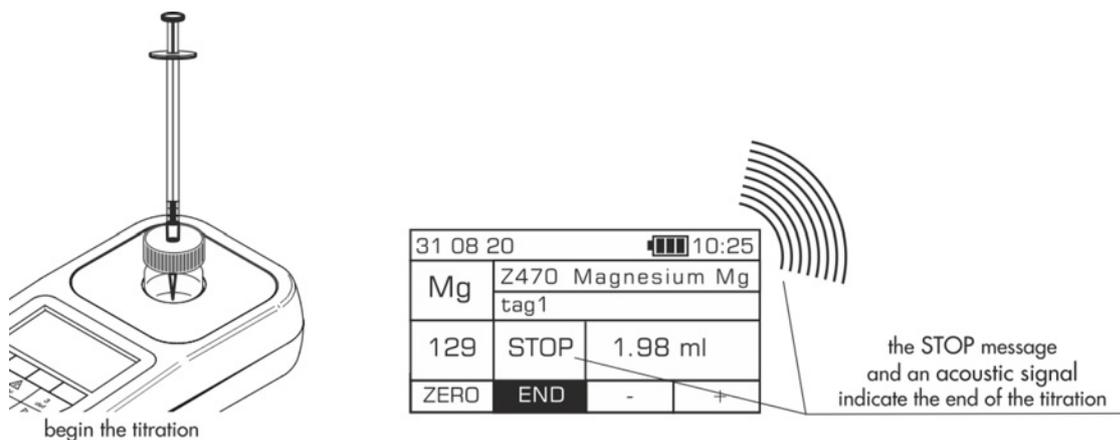


- Place the syringe with the Reagent Ca-Mg-3 in the cap hole. Press the **MEAS** key and begin the titration by carefully adding **Reagent Ca-Mg-3** in small portions. If the entire volume of the syringe is emptied and there is no end of titration, take another portion (1 ml) of Reagent Ca-Mg-3 and continue titration.

**NOTE:**

To obtain accurate results of titration shake carefully the instrument with the vial after each portion of Reagent Ca-Mg-3 is added to mix well.

The end of the titration is indicated by an acoustic signal and the message **STOP** appears on the instrument.



**NOTE:**

Remember not to switch off the beeper message before taking a measurement, see [12.7 Beeper](#). It will disable the acoustic signal which indicates the end of the titration.

- Read the volume of added **Reagent Ca-Mg-3** in ml on the syringe scale and enter the value using the „+“ button or any other key on the keyboard apart from the **Power key** and the **minus key**. Press the **END** key. The result – **the concentration of magnesium ions** – is displayed in **the arbitrary units (A)**.

31 08 20		10:25	
Mg	Z470 Magnesium Mg	tag1	
129	STOP	1.98 ml	
ZERO	END	-	+

31 08 20		10:25	
Mg	Z470 Magnesium Mg	tag 1	
192.1 A			
ZERO	MEAS	GUIDE	REC

- To determine the concentration of magnesium expressed in **mg/l (ppm)** subtract the result obtained in the method **Z471 Calcium Ca fresh water (B)** from the result obtained in **Z470 Magnesium Mg fresh water (A)** method.

**Example:**

$$\begin{array}{rcccl} \text{magnesium content value} & - & \text{calcium content value} & = & \text{magnesium concentration} \\ \text{(A) – arbitrary unit} & & \text{(B) – arbitrary unit} & & \text{mg/l} \end{array}$$

**NOTE:**

If the calcium content was determined first according to **Z471 Calcium Ca Marine method**, **the magnesium content** will be automatically calculated from the arbitrary units (A) by the photometer and displayed as a basic unit – **in mg/l**.

## Potential interferences

the high content of bi- or multivalent metals  
- mainly manganese (Mn) and iron (Fe)

may cause falsely high readings