

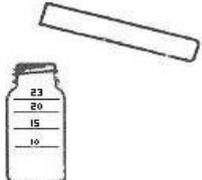
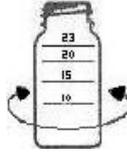
# ALKALINITY TEST

Article Nr. T24443-01

## TEST PROCEDURE

### P-alkalinity

P-alkalinity is expressed in ppm  $\text{CaCO}_3$  or mval/l ( $1\text{mval/l} = 50\text{ ppm CaCO}_3$ ). In this paper ppm  $\text{CaCO}_3$  is used. The P-alkalinity figure is expressed as volume sulphuric acid needed to change (neutralise) the colour in a water sample to which phenolphthalein is added.

	1. Rinse lab ware with test water before test. Fill the measuring cylinder (5.83 ml) with water that is to be tested and pour it into the mixing bottle.
	2. Add the content of one Phenolphthalein Indicator Powder Pillow to the square-mixing bottle.
	3. Swirl to mix.
	4. If the water stays colourless, the P-alkalinity = 0. If the colour changes to pink, add Sulphuric acid standard solution (0.035 N) one drop at a time and swirl to mix after each drop.
	5. Count the number of drops needed to neutralise the pink colour (until the sample turns colorless).
<b>drops x 20 = ...</b>	6. Multiply by 20 number of drops of titrant used.

**Number of drops x 20 = P-alkalinity ppm  $\text{CaCO}_3$ .**

Recommended P-alkalinity in boiler water is:

Boiler pressure <6 bar = 250-500 ppm  $\text{CaCO}_3$  = 13-25 drops.

Boiler pressure 6-15 bar = 150-400 ppm  $\text{CaCO}_3$  = 8-20 drops.

Boiler pressure 15-30 bar = 100-300 ppm  $\text{CaCO}_3$  = 5-15 drops.

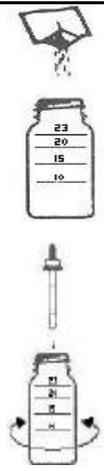
Low P-alkalinity is compensated by increased dosage and high P-alkalinity by decreased dosage, possibly combined with increased blow down. The result should be followed up by frequent tests.

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## M-alkalinity (when needed)

M-alkalinity is expressed in the same way as P-alkalinity, but the indicator Bromcresol Green-Methyl red is used.



7. Add the content of one Bromcresol Green -Methyl Red Indicator pillow to the **remaining** sample from the P-alkalinity test.

8. Add Sulphuric acid standard solution (0.035 N) one drop at a time and swirl to mix after each drop.

9. Count the number of drops needed to change the colour from blue to pink and add them to the number of drops for P-alkalinity.

**Drops**  
(step 5+step 9)  
x 20 =...

6. Multiply by 20 numbers of drops of titrant used.

Rinse all lab ware with deionised water.

Total number of drops x 20 = M-alkalinity ppm CaCO<sub>3</sub>.

M-alkalinity minus P-alkalinity result should be relatively constant. An increase in the difference indicates foreign particles in the water, such as oil. The reason should be investigated.

M-alkalinity should not be higher than twice the P-alkalinity.

