

# Test kits for water analysis

## Description of individual parameters and tests

### Hardness (total and residual) °e

The total hardness of water is based on its content of alkaline earth ions (calcium and magnesium ions). This content depends on the geological conditions and may vary considerably. Knowledge of the total hardness is important for the use of water in industrial as well as municipal applications, e.g. in the household as wash water or as boiler feed water in industry.

#### Reaction bases:

(a) Complexometric titration  
in accordance with DIN 38406 E3 and DIN 38409 H6.

(b) Colorimetry with a mixed indicator  
Copper(II) ions can delay or (in higher concentrations) even block the color change of the indicator. For this reason allow enough water to run through copper pipes prior to sampling.

#### VISOCOLOR® alpha total Hardness REF 935 042

Type: titration test kit  
Range (visual): 1 drop  $\triangleq$  1.25 °e  $\triangleq$  17.8 mg/L CaCO<sub>3</sub>  
Reaction basis: (a) titration  
Sufficient for: 100 tests with an average hardness of 12.5 °e  
Shelf life: at least 1.5 years after production  
Sea water suitability: yes, after dilution (1+29)

#### VISOCOLOR® ECO total Hardness REF 931 029

Type: titration test kit  
Range (visual): 1 drop  $\triangleq$  1.25 °e  $\triangleq$  17.8 mg/L CaCO<sub>3</sub>  
Reaction basis: (a) titration  
Sufficient for: 110 tests with an average hardness of 12.5 °e  
Shelf life: at least 1.5 years after production  
Sea water suitability: yes, after dilution (1+29)



#### VISOCOLOR® HE total Hardness H 20 F REF 915 005 Refill pack REF 915 205

Type: titration test kit  
Range (visual): 0.6–25.0 °e or  
0.1–3.6 mmol/L Ca<sup>2+</sup>  
1 gradation mark = 0.625 °e =  
0.1 mmol/L Ca<sup>2+</sup>  
Reaction basis: (a) titration  
Sufficient for: about 200 tests with an average hardness of 12.5 °e or 1.8 mmol/L Ca<sup>2+</sup>  
Shelf life: at least 1.5 years after production  
Sea water suitability: yes, after dilution (1+29)

#### VISOCOLOR® alpha residual Hardness REF 935 080

Type: colorimetric test kit  
Range (visual): 0.00 · 0.05 · 0.10 · 0.19 · 0.38 °e  
Reaction basis: (b) colorimetry  
Sufficient for: 200 tests  
Shelf life: at least 1 year after production  
Sea water suitability: no

#### VISOCOLOR® HE total Hardness H 2 REF 915 002 Refill pack REF 915 202

Type: titration test kit  
Range (visual): 0.06–2.50 °e or  
0.01–0.36 mmol/L Ca<sup>2+</sup>  
1 gradation mark = 0.06 °e or  
0.01 mmol/L Ca<sup>2+</sup>  
Reaction basis: (a) titration  
Sufficient for: 200 tests with an average hardness of 1.25 °e or 0.18 mmol/L Ca<sup>2+</sup>  
Shelf life: at least 1.5 years after production  
Sea water suitability: no

#### VISOCOLOR® ECO additive reagent Z-1 REF 931 929

to eliminate copper ions during determination of total hardness

### Hydrazine N<sub>2</sub>H<sub>4</sub>

Hydrazine is used to destroy residual oxygen in boiler feed water and condensate water, for example in power plants, to avoid corrosion of the boiler casing. Reaction products are merely nitrogen gas and water, thus the salt load of the water is kept low.

Because of its highly reactive properties, hydrazine is also used as fuel in aviation and astronautics.

Hydrazine is toxic and has a highly toxic effect on water organisms. Hydrazine can be absorbed through the skin. Therefore, water and waste water with potential content of hydrazine must be monitored and tested.

#### Reaction basis:

DIN method: In acidic solution hydrazine reacts with 4-dimethylaminobenzaldehyde to form a yellow/orange colored compound (Reaction basis according to DIN 38413-P1).

#### VISOCOLOR® ECO Hydrazine REF 931 030 Refill pack REF 931 230

Type: colorimetric test kit  
Ranges  
visual: 0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 ·  
0.30 · 0.40 mg/L N<sub>2</sub>H<sub>4</sub>  
PF-12 / PF-12<sup>Plus</sup>: 0.05–0.40 mg/L N<sub>2</sub>H<sub>4</sub>  
Sufficient for: 130 tests  
Shelf life: at least 1 year after production  
Sea water suitability: yes

### Hydrosulfite S<sub>2</sub>O<sub>4</sub><sup>2-</sup>

see Dithionite, page 64

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