

## HARDNESS YES/NO

Yes/No Method

**CONTROL TEST FOR  
INDUSTRIAL AND DOMESTIC  
WATER SOFTENERS**

**4, 8, 20 mg/l CaCO<sub>3</sub>**

Water hardness is caused by the presence of calcium and magnesium ions. Hardness prevents the formation of lather with soap, and can cause scaling in water systems. Ion-exchange softeners are widely used for the removal of hardness in both domestic water systems and industrial applications.

The Palintest Hardness Yes/No test provides a simple control test for industrial and domestic water softeners. The test will demonstrate whether the water has been properly softened or whether the softener bed requires regeneration or replacement. The test can be used with the control limit set at a hardness of 4, 8 or 20 mg/l CaCO<sub>3</sub>.

### Method

Calcium and magnesium ions are complexed by reaction with ethylene diamine-tetraacetic acid (EDTA). Excess calcium and magnesium ions react with a specific indicator to produce a distinctive coloration. The Palintest Hardness Yes/No test uses a tablet reagent containing a standardised amount of EDTA with screened eriochrome black as indicator. The test produces a distinctive red/green colour indication depending on whether the water is above or below a designated hardness control limit.

### Reagents and Equipment

Palintest Hardness Yes/No Tablets

Palintest Sample Container (PT 506, PT 510 or PT 519)

### Test Procedure

- 1 Take a sample of water from the softener in the sample container, filling to the 50 ml mark.
- 2 Add two Hardness Yes/No tablets and shake the container until the tablets have completely disintegrated.

If the sample turns RED the softener requires regeneration or replacement.

If the sample turns GREEN softened water is being produced.

## Note

Under normal operation most water softeners will produce water of negligible hardness. A control limit for the hardness does however need to be set in order to determine at what point the softener bed requires regeneration or replacement. Different control limits can be set depending on the specification of the water ultimately required.

When the test is carried out according to the procedure described above, the colour change takes place at a water hardness of 8 mg/l. Water with a hardness below this limit would normally be considered suitable for domestic or general industrial applications.

For certain industrial applications water from the softener may be required to be controlled at less than 4 mg/l Hardness. In such cases use one Hardness Yes/No tablet in 50 ml water.

For domestic applications and some industrial processes a higher hardness control limit of 20 mg/l may be acceptable. In such cases use one Hardness Yes/No tablet in 10 ml water.

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