BROMINE

Colour Match Method
Using Palintest Comparator

TEST FOR FREE, COMBINED AND TOTAL BROMINE IN WATER

0 – 2.0 mg/l
0 – 8.0 mg/l

Bromine and bromine-release compounds are used for the disinfection of swimming pool water, and in many other water treatment systems. Accurate measurement of the bromine residual is an essential aspect of control of these processes.

The bromine level can be expressed in terms of the free bromine, combined bromine or total bromine residuals. However free and combined bromine are both considered powerful disinfectants and it is not normally necessary to differentiate between these two forms. For the majority of applications therefore the measurement of the total bromine residual is sufficient.

The Palintest DPD bromine method provides a simple means of measuring bromine residuals up to a level of 8 mg/l. A supplementary procedure can be used to differentiate between free and combined bromine if desired.

Method

The Palintest Bromine test uses the DPD method now internationally recognised as the standard method of testing for disinfectant residuals. In the DPD method the reagents are provided in tablet form for maximum convenience and simplicity of use.

Bromine reacts with diethyl-p-phenylene diamine (DPD) in buffered solution to produce a pink coloration. The intensity of the colour is proportional to the total bromine concentration and is measured by comparison against colour standards using a Palintest Comparator and Disc.

For the separate determination of free and combined bromine, a supplementary procedure using sodium nitrite is used. The nitrite destroys the free bromine in the sample and the colour produced in the DPD test then corresponds to the combined bromine only. The free bromine content is thus obtained by difference between the total bromine and combined bromine readings.

CD 060, CM 060, AK 060

Reagents and Equipment

Palintest DPD No 1 Tablets
Palintest DPD Nitrite Tablets
Palintest Comparator (PT 520)
Palintest Comparator Disc CD 060/2 or CD 060/8 Bromine (see below)
Square Test Tubes, 13.5 mm, 10 ml (PT 521)

Disc CD 060/2 covers the range 0 - 2.0 mg/l bromine in steps 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 mg/l Br_2.

Disc CD 060/8 covers the range 0 - 8.0 mg/l bromine in steps 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, 5.0, 6.0 and 8.0 mg/l Br_2.

Test Procedure — Total Bromine

1 Rinse the square test tube with sample leaving 2 to 3 drops of sample in the tube.

2 Add one DPD No 1 tablet and crush.

3 Fill the tube with sample to the 10 ml mark and mix to dissolve the tablet.

4 Place the tube in the Comparator and match against the disc in the usual manner (see Comparator instructions).

5 The disc reading represents the **Total Bromine** residual as milligrams per litre Br_2.

For most purposes the test can be terminated at this stage. If it is desired to measure free and combined bromine proceed as indicated in the following section.

Test Procedure — Free and Combined Bromine

1 Fill a square test tube with sample to the 10 ml mark. Add one DPD Nitrite tablet, crush and mix to dissolve.

2 Take a second clean square test tube and add 2 to 3 drops of solution from the first tube. Add one DPD No 1 tablet, crush and then add the remainder of the solution to make up to the 10 ml mark. Mix to dissolve tablet.

3 Place the test tube in the Comparator and match in the usual manner. The disc reading represents the **Combined Bromine** residual as milligrams per litre Br_2.

4 The free bromine residual as milligrams per litre is obtained by subtracting the second comparator disc reading from the first.

ie Free Bromine = Total Bromine - Combined Bromine.

Notes

In systems containing both chlorine and bromine it is possible to differentiate between the chlorine and bromine residuals using a supplementary procedure involving Palintest DPD Glycine tablets. Details of this procedure are given on a separate test instruction sheet.

ALKALINITY (ALKAVIS)

Colour Match Method
Using Palintest Comparator

TEST FOR TOTAL ALKALINITY IN NATURAL AND TREATED WATERS

0 – 250 mg/l $CaCO_3$

Natural and treated waters may contain a variety of dissolved alkaline substances such as carbonates, bicarbonates, hydroxides and - to a lesser extent - borates, phosphates and silicates. In water at neutral pH the alkalinity derives mainly from the presence of bicarbonates.

Total alkalinity is an important test in determining the aggressiveness or scale forming tendency of the water. If the total alkalinity is low the water may be aggressive and cause corrosion to pipework and structures; if the total alkalinity is high the water may more readily promote scale formation. Alkalinity control is therefore an important part of many water treatment programmes.

The Palintest Alkavis test uses a colorimetric method and covers the total alkalinity range 0 - 250 mg/l $CaCO_3$. The test is particularly suitable for checking natural and drinking waters, swimming pool water, boiler water, etc.

Method

The Palintest Alkavis test is based on a unique colorimetric method and uses a single tablet reagent. The test is simply carried out by adding a tablet to a sample of the water. Under the conditions of the test a distinctive range of colours from yellow, through green, to blue are produced over the alkalinity range 0 - 250 mg/l $CaCO_3$. The colour produced in the test is indicative of the alkalinity of the water and is measured by comparison against colour standards using a Palintest Comparator and Disc.

Reagents and Equipment

Palintest Alkavis Tablets
Palintest Comparator (PT 520)
Palintest Comparator Disc CD 192 Alkalinity
Square Test Tubes, 13.5 mm, 10 ml (PT 521)

Disc CD 192 covers the range 0 - 250 mg/l alkalinity in steps 0, 25, 50, 75, 100, 125, 150, 200 and 250 mg/l as $CaCO_3$.

CD 192, CM 192, AK 192

Test Procedure

1 Fill a square test tube with sample to the 10 ml mark.

2 Add one Alkavis tablet, crush and mix thoroughly to dissolve.

3 Place the test tube in the Comparator and match against the disc in the usual manner (see Comparator instructions).

4 The disc reading represents the total alkalinity of the sample as milligrams per litre $CaCO_3$.

pH VALUE

Colour Match Method
Using Palintest Comparator

TEST FOR pH VALUE OF WATER AND AQUEOUS SOLUTIONS

5.2 – 9.6 (4 Ranges)
4 - 11

pH value is a parameter frequently determined on water and aqueous solutions. The Palintest pH method provides a simple test for the determination of pH for a variety of applications. The test is available in four narrow ranges covering pH values between 5.2 and 9.6; and one wide range covering pH values from 4 to 11.

Method

Palintest pH methods use standard pH indicators in tablet form. Different indicators are used to cover different pH ranges. Each tablet contains the precise amount of indicator needed for the test. All Palintest pH tablets contain a dechlorinating agent so that the tests can be carried out in water containing chlorine or other disinfectant residuals.

The colour produced when the indicator tablet is added to a sample of the water is indicative of the pH value. This colour is measured by comparison against colour standards using a Palintest Comparator and Disc.

Reagents and Equipment

Palintest pH Indicator Tablets (see table)
Palintest Comparator (PT 520)
Palintest Comparator Disc - pH (see table)
Square Test Tubes, 13.5 mm, 10 ml (PT 521)

CD/CM/AK 128/129/131/135/136

Disc Code	Range of Standards	Indicator Tablet Required
CD 128	5.2 - 6.8	Bromocresol Purple
CD 129	6.0 - 7.6	Bromothymol Blue
CD 131	6.8 - 8.4	Phenol Red
CD 135	8.0 - 9.6	Thymol Blue
CD 136	4 - 11	Universal pH

Test Instructions

1 Select the appropriate disc and indicator tablets for the pH range under test.

2 Fill a square test tube with sample to the 10 ml mark.

3 Add one pH indicator tablet, crush and mix to dissolve.

4 Place the test tube in the Comparator and match against the disc in the usual manner (see Comparator instructions).

5 The disc reading represents the pH value of the sample.

Note

If the colour is outside the range of the disc and cannot be matched, the test should be repeated using a higher or lower range disc with the corresponding indicator tablets.