GASTEC No.222 Instructions for Free Residual Chlorine Detector Tube

FOR SAFE OPERATION :

Carefully read this manual before use.

⚠ CAUTION : If you do not observe the following precautions, you may suffer injuries or damage the product.

1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, broken pieces and reagent with bare hand(s).

△NOTES : For maintaining performance and reliability of the test results, observe the following.

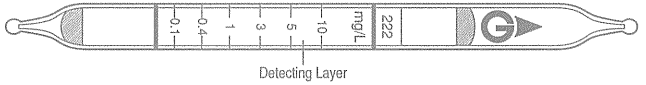
1. Use this tube within the temperature range of 5 - 40℃(41 - 104℉) in water.
2. Use this tube between pH values of 4.0 to 10.0.
3. This tube may be interfered with by the coexisting substances. Please refer to the table "INTERFERENCES" below.
4. The shelf life and storage condition of the tube are marked on the label of the tube box.
5. Place the higher end plug packing of the tubes above the water surface.
6. The reagent of this tube may be deteriorated by sunlight. Do not expose this tube to direct sunlight.

APPLICATION OF THE TUBE :

Use this tube for the detecting Free Residual Chlorine ion in the waste water.

SPECIFICATION :

(Because of Gastec's commitment to continued improvement, specifications are subject to change without notice.)



Measuring Range	0.1 - 10 mg/L
Sampling Time	4 minutes
Detecting Limit	0.05 mg/L
Colour Change	White → Reddish orange
Reaction Principle	Free Residual Chlorine + 3,3',5,5' - tetramethylbenzidine → Reddish orange product

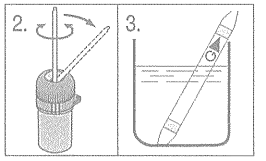
Coefficient of Variation : 15% (for 0.1 to 3 mg/L), 10% (for 3 to 10 mg/L)
**** Shelf Life : Please refer to the validity date printed on the tube box.**
**** Store the tubes in a dark and cool place.**

EFFECT BY ENVIRONMENTAL CONDTION :

Water Temperature : No effect by the water temperature between 5 - 40℃(41-104℉).
pH Value : Use the tube in the pH value of 4.0 - 10.0.

MEASUREMENT PROCEDURE :

1. Take sample water into an approximately 100 mL capacity of dry, clean beaker.
2. Break tips off a fresh detector tube by bending each tube end in the tube tip holder (optional).
3. Immerse the filled end of the tube into the sample water as illustrated. Capillary action occurs and the sample water instantly rises through the reagent. If the sample contains free residual chlorine ion, the white reagent in the tube turns to reddish orange colour.



4. When the sample water rises up to the upper end plug, remove the tube.
5. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
6. If the stain exceeds the highest calibration mark (10 mg/L), dilute the sample with pure water and retest using a fresh tube. Obtain true concentration by multiplying the tube reading by the dilution ratio.

$$\text{True Concentration} = \frac{V1 + V2}{V1} \times \text{Tube Reading}$$

V1 : Volume of Sample water
V2 : Volume of dilution (pure water)

△NOTES :

Do not immerse the tube into sample water past the upper end plug.

INTERFERENCES :

Substance	Formula	Concentration	Interference	Changes colour by itself to
Nitrite ion	NO_2^-	≧0.3 mg/L	—	No discolouration
Ammonium ion	NH_4^+	≧0.1 mg/L	—	No discolouration
		May produce bluish green colour for whole layer if free residual chlorine coexists.		
Chloride ion	Cl^-	≧30 mg/L	—	No discolouration
Nitrate ion	NO_3^-	≧50 mg/L	—	No discolouration
Sulphate ion	SO_4^{2-}	≧30 mg/L	—	No discolouration
Phosphate ion	PO_4^{3-}	≧20 mg/L	—	No discolouration

This table of interference substances primarily expresses the interference of each coexisting substance in the concentration range, that is equivalent to concentration of the target substance. Therefore, the test result may show positive results due to other substances not listed in the table. If more information is needed, please contact us or Gastec representatives.

INSTRUCTIONS ON DISPOSAL :

The reagent of the tube does not use toxic substances. When disposing the tube regardless of whether it has been used or not, follow the rules and regulations of your local government.

WARRANTY :

If you have any questions regarding gas detection and the quality of the tubes, please feel free to contact your Gastec representatives.

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