

# GASTEC Instructions for No.291 Nickel Detector Tube

## FOR SAFE OPERATION :

Read this instruction manual carefully prior to use.

**⚠ CAUTION : If not observed, injuries to the operator or damage to the product may result.**

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

**△ NOTES : For maintaining performance and reliability to the test results.**

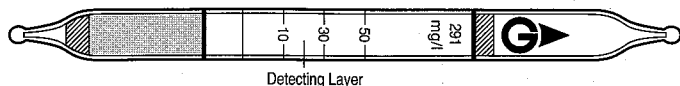
1. Use this tube under the temperature range of 5 - 30°C (41 - 86°F) in water.
2. Use this tube between pH values of 3.5 to 8.0.
3. This tube may be interfered with by the coexisting substances. Refer to the "INTERFERENCES".
4. Shelf life and storage condition of the tube is marked on the label of the box of tube.
5. Place the lower end plug packing of the tubes below the water surface.
6. If tubes are kept more than 30 minutes in the water, the printed scale of the tube will peel off. Read the concentration immediately after the sampling is completed.

## APPLICATION OF THE TUBE :

Use this tube for the detection of Nickel in the Waste Water.

## SPECIFICATION :

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



Measuring Range	5 - 50 mg/l
Sampling Time	3 minutes
Detecting Limit	5 mg/l
Color Change	White → Red
Reaction Formula	Nickel react with indicator to produce complex compound to discolor the reagent to red.

**\*\* Shelf Life : Please refer to the Validity Date printed on the box of tube.**

**\*\* Store the tubes under dark and cool place.**

## EFFECT BY ATMOSPHERIC CONDITION :

**Water Temperature :** No effect by the water temperature between 5 - 30°C (41 - 86°F).

**pH Value :** Use the tube in the pH value of 3.5-8.0.

## MEASUREMENT PROCEDURE :

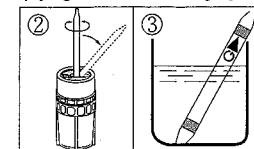
1. Take sample water into an approximately 100 ml capacity of dry, clean beaker.
2. Break tips off a fresh detector tube by bending each tube end in the tube tip breaker (tube tip holder No.721 optional extra).

3. Immerse the filled end of the tube into the sample water as illustrated below. Capillary action occurs and the sample water instantly rises through the reagent. If the sample contains nickel, the white reagent of the tube turns to red color.
4. When the sample water rises up to the upper end plug, remove the tube.
5. Read concentration at the interface of the stained-to unstained reagent.
6. If the stain exceeds the highest calibration mark (50 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 :

More than 30 minutes lapse after immersion of the tube will cause peeling off of the calibration marks. If tube did not start capillary action immediately after immersed into the water, we recommend the use of a rubber bulb to help start the action. Connect the squeezed rubber bulb at the upper end of glass tube. When the tube begins capillary action, remove the rubber bulb from the tube. Tube must be read immediately after the test. Do not immerse the tube into sample water past the upper end plug.

## INTERFERENCES :

Substance	Formula	Concentration	Interference	Changes color by itself to
Zinc	Zn <sup>2+</sup>	≥ 20 mg/l	Minus error	No discoloration by 1000 mg/l
Aluminum	Al	≥ 30 mg/l	Minus error	No discoloration by 1000 mg/l
Cobalt	Co	≥ 3 mg/l	Plus error	Greenish brown by 20 mg/l or higher
Cyanide ion	CN <sup>-</sup>	≥ 10 mg/l	Minus error	No discoloration by 100 mg/l
Iron (II)	Fe <sup>2+</sup>	≥ 5 mg/l	Plus error	Brown at 60 mg/l or higher
Iron (III)	Fe <sup>3+</sup>	≥ 100 mg/l	Minus error	No discoloration at 100 mg/l
Cooper	Cu	≥ 5 mg/l	Plus error	Reddish brown/yellowish green

The table of this interference substances primarily expresses the interference of each coexisting substance in the concentration range, equivalent to the substance concentration. Therefore, the test result may be given positive result by the other substance not listed in the table. For more information is needed, please contact us or our distributors in your territory.

## DISPOSAL INSTRUCTION :

Reagent of the tube does not use the toxic substances. When disposing the tube regardless of used or unused, follow the rules and regulations of the local government.

## WARRANTY :

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