GASTEC No.11S Instructions for Nitrogen Oxides Detector Tube

FOR SAFE OPERATION :
Carefully read this manual and the instruction manual of your Gastec Gas Sampling Pump.

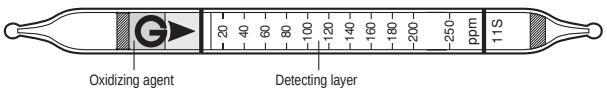
⚠ WARNING :
1. Use only Gastec detector tubes in a Gastec pump.
2. Do not interchange or use non-Gastec parts or components in Gastec's detector tube and pump system.
3. Using non-Gastec parts or components in Gastec's detector tube and pump system or using a non-Gastec detector tube with a Gastec pump or using a Gastec detector tube with a non-Gastec pump may damage your detector tube and pump system, or may cause serious injuries, or death to the end-user. It will also void all warranties, and guarantees regarding performance and data accuracy.

⚠ 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).
3. The sampling time represents the time necessary to draw the air sample through the tube. The tube must be positioned in the desired sampling area for the entire sampling time or until the flow finish indicator indicates the end of the sampling.

△NOTES : For maintaining performance and reliability of the test results, observe the following.
1. Use Gastec Gas Sampling Pump together with Gastec Detector Tubes only for the purposes specified in the instruction manual of the detector tube.
2. Use this tube within the temperature range of 0 - 40°C (32 - 104°F).
3. Use this tube within the relative humidity range of 20 - 90%.
4. This tube may be interfered with by the coexisting gases. Please refer to the table "INTERFERENCES" below.
5. The shelf life and storage condition of the tube are marked on the label of the tube box.

APPLICATION OF THE TUBE : Use this tube for detecting Nitrogen Oxides in the air or in industrial areas and for determining the environmental atmospheric condition.

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



Measuring Range	5 - 10 ppm	10 - 250 ppm	250 - 625 ppm
Number of Pump Strokes	2	1	1/2
Correction Factor	1/2	1	2.5
Sampling Time	45 seconds per pump stroke		30 seconds
Detecting Limit	2 ppm (n=2)		
Colour Change	White → Pale green		
Reaction Principle	$NO + Cr^{6+} + H_2SO_4 \rightarrow NO_2$ $NO_2 + (C_6H_5)_2NH \rightarrow C_6H_5NHC_6H_4NO$		

Coefficient of Variation : 10% (for 10 to 40 ppm), 5% (for 40 to 250 ppm)
**** Shelf Life: Please refer to the validity date printed on the tube box.**
**** Store the tubes in a dark and cool place.**

CORRECTION FOR TEMPERATURE, HUMIDITY AND PRESSURE :
Temperature : No correction is required.
Humidity : No correction is required.
Pressure : To correct for pressure, use the formula below:

$$\frac{\text{Tube Reading (ppm)} \times 1013 \text{ (hPa)}}{\text{Atmospheric Pressure (hPa)}}$$

MEASUREMENT PROCEDURE :
1. For checking the leakage of the pump, insert a freshly sealed detector tube into the pump. Follow the instructions provided with the pump operation manual.
2. Break the tips off the fresh detector tube with the tube tip breaker in the pump.
3. Insert the tube into the pump inlet with the arrow (G►) on the tube pointing toward the pump.
4. Make certain the pump handle is all the way in. Align the guide marks on the pump body with the guide marks on the handle.
5. Pull the handle all the way out until it locks at one pump stroke (100 mL). Wait 45 seconds and confirm the completion of the sampling.
6. For smaller measurements less than 10 ppm, repeat the above sampling procedure one more time. For measurements higher than 250 ppm, prepare a fresh tube and perform a half pump stroke.
7. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
8. If necessary, multiply the readings by the correction factors of the pump strokes and atmospheric pressure.

INTERFERENCES :

Substance	Concentration	Interference	Interference gas only
Hydrogen Chloride	≧50 ppm	Unclear demarcation	Bluish purple at 10 ppm
Ozone	≧80 ppm	Unclear demarcation (2 layers)	Pale brown
Sulphur Dioxide, Hydrogen Sulphide	≧1/1	+	No discolouration
Methanol	≧400 ppm	–	No discolouration

Oxidizing Agent

Nitric oxide is oxidized to form nitrogen dioxide. If organic solvents of high concentration is coexisted, oxidizing agent is deteriorated to produce minus error for Nitric oxide concentration.

This table of interference gases primarily expresses the interference of each coexisting gas in the concentration range, that is equivalent to the gas concentration. 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 our distributors in your territory.

DANGEROUS AND HAZARDOUS PROPERTIES :
Threshold Limit Value-Time Weighted Average by ACGIH (2011): NO_2 - 3 ppm, NO - 25 ppm
Threshold Limit Value-Short Term Exposure Limit (2011) by ACGIH: NO_2 - 5 ppm

INSTRUCTIONS ON DISPOSAL :
The reagent of the tube uses a small amount of hexavalent chromium. 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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