

# GASTEC Instructions for No. 180 Amines 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.

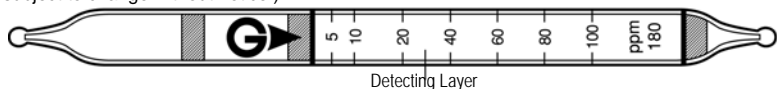
1. When breaking the tube ends, keep away from eyes.
2. Do not touch the broken glass tubes, broken pieces and reagent with bare hand(s).
3. The sampling time represents the time necessary to draw the air sample through the tube. The tube must be positioned in the desired sampling area for the entire 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 0 - 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.
6. If the tubes are exposed to sunlight for one hour or more, the reagent of the tube will deteriorate to white. You, then, cannot use the tube for measuring the gas.

**APPLICATION OF THE TUBE:** Use this tube for detecting amines 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 - 100 ppm
Number of Pump Strokes	1
Stroke Correction Factor	1
Sampling Time	30 seconds per pump stroke
Detecting Limit	0.5 ppm (n = 1)
Colour Change	Pink → Yellow to Brown
Reaction Principle	$2R \cdot NH_2 + H_2SO_4 \rightarrow (R \cdot NH_3)_2SO_4$

**Coefficient of Variation: 10% (for 5 to 20 ppm), 5% (for 20 to 100 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 correction table:** Correct for temperature with the table below.

Temperature °C (°F)	0(32)	5(41)	10(50)	15(59)	20(68)	25(77)	30(86)	35(95)	40(104)
Correction Factor	2.0	1.7	1.4	1.2	1.0	0.9	0.8	0.7	0.6

**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 (➔) 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 30 seconds and confirm the completion of the sampling. For monoethanolamine measurement, repeat the above sampling procedure two more times.
6. Read the concentration level at the interface where the stained reagent meets the unstained reagent.
7. If necessary, multiply the readings by the correction factors of the temperature and atmospheric pressure respectively.

## INTERFERENCES:

Substance	Concentration	Interference	Interference gas only
Aniline, Hydrazine, Pyridine		+	Yellowish brown
Amidos		No	No discolouration
Amines, Ammonia		+	Yellowish brown

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.

## APPLICATION FOR OTHER SUBSTANCES:

The Tube 180 can also be used to detect the following substances with correction factors.

Substance	Correction	Pump Strokes	Colour Change	Detecting Range
Allylamine	1.7	1	Yellow	8.5 - 170
Ammonia	0.3	1	Yellow	1.5 - 30
Isopropylamine	1.1	1	Salmon Pink	5.5 - 110
Ethylamines	1.0	1	Yellow	5 - 100
N - Ethyl Morpholine	1.0	1	Yellow	5 - 100
Ethylene diamine	2.8	1	Yellow	14 - 280
Diisopropylamine	1.0	1	Pale orange	5 - 100
Diethylamine	1.1	1	Pale brown	5.5 - 110
Diethylethanolamine	1.2	1	Pale brown	6 - 120
Cyclohexyl amine	1.4	1	Salmon Pink	7 - 140
Di - n - Butylamine	1.0	1	Pale orange	5 - 100
Dipropylamine	0.8	1	Yellow	4 - 80
Dimethyl aminopropylamine	1.6	1	Grayish Red	8 - 160
Dimethylamine	1.1	1	Salmon Pink	5.5 - 110
Dimethylethanolamine	1.3	1	Pale Orange to yellow	6.5 - 130
N, N - Dimethylethylamine	0.8	1	Yellow	4 - 80
Tetramethylenediamine	1.7	1	Purple to yellow	8.5 - 170
Triethyl Amine	0.9	1	Yellow	4.5 - 90
Trimethylamine	0.7	1	Yellow	3.5 - 70
n - Butylamine	1.6	1	Grayish red to red	8 - 160
1 - Butylamine	1.1	1	Pale brown	5.5 - 110
Propylamine	1.2	1	Salmon Pink	6 - 120
Propyleneimine	1.1	1	Yellow	5.5 - 110
n - Hexylamine	1.8	1	Pale Orange	9 - 180
Methylamine	1.0	1	Pale brown to yellow	5 - 100
N - Methyl Morpholine	1.0	1	Yellow	5 - 100
Monoethanolamine	1.4	3	Yellow	7 - 140
Morpholine	1.8	1	Yellow	9 - 180
n-Methyl pyrrolidone	2.7	1	White	50 - 270

**CORRECTION FACTOR:** Detector tubes are primarily designed to measure specific gases. But it is also possible to measure other substances of similar chemical properties with the aid of a correction factor or chart. The correction factor is a number which is multiplied by the concentration as interpreted from the colour on the detector tube. The correction factor may also be presented as a chart on the tube if the correction relationship is nonlinear. Therefore, make use of the correction factor/chart measurement ranges as a reference. Moreover, this factor may vary slightly between production batches. For a more precise factor please contact your Gastec distributor.

**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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