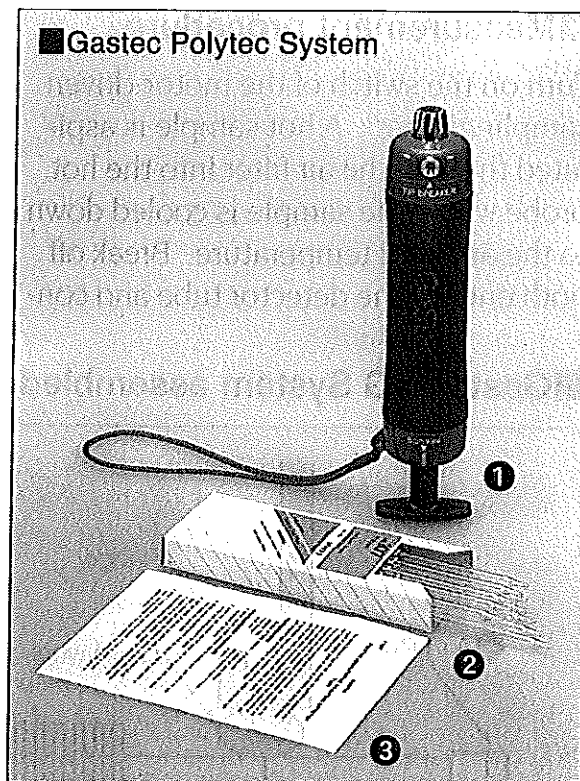


Qualitative Analysis System for Multiple Gases (Gastec Polytec System)

The Gastec Polytec System consists of the Model GV-100 Gas Sampling Pump and the Polytec tubes. The Polytec tubes are unique detector tubes, each having 1 to 7 reaction layers to determine multiple unknown substances in the sample simultaneously. When you pull the handle of the Pump and wait for a predetermined sampling time, the colour(s) of the Polytec tube's layer(s) change uniquely according to the contents of the sample. Four types of Polytec tubes are available: Polytec I (No.107), Polytec II (No.25), Polytec III (No.26), and Polytec IV (No.27). Detailed descriptions are given in the instruction sheets included with individual Polytec tubes. If you already have the Model GV-100 Gas Sampling Pump, you need only to obtain the desired Polytec tubes.



● Features

- Easy determination of constituents in the sample
- No costly equipment or specialists required

■ Gastec Polytec System configuration

Components	Quantity	Remarks
Model GV-100 Gas Sampling Pump (Photo ①)	1	Optional. Provided as the Model GV-100S Gas Sampling Pump Kit.
Polytec tubes (Photo ②)	10 tubes/box	Polytec I (No.107), Polytec II (No.25), Polytec III (No.26), or Polytec IV (No.27)
Instruction sheet (Photo ③)	1	One for each kind of Polytec tubes

■ Polytec I (No.107)



White

Number of pump strokes : n=3

Sampling time : 1 minute per 1 pump stroke / 3 minutes

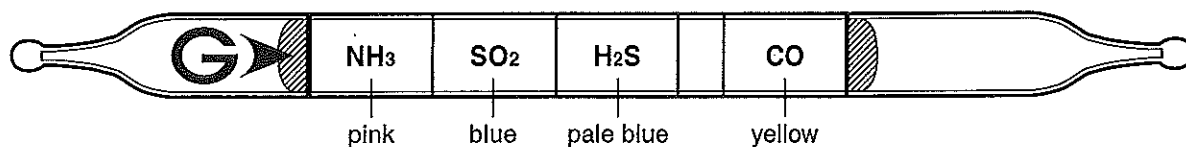
Shelf life : 3 years

Reaction principle : $\text{Substance} + \text{I}_2\text{O}_5 + \text{H}_2\text{S}_2\text{O}_7 \rightarrow \text{I}_2$

Substance	Concentration*	Changes colour from white to
Carbon disulphide	≥ 1 ppm	} Green
Hydrogen sulphide	≥ 1 ppm	
Carbon monoxide	≥ 10 ppm	Green or Brown
Acetone	≥ 1000 ppm	} Brown or Green
Acetylene	≥ 10 ppm	
Ethylene	≥ 70 ppm	
Benzene	≥ 20 ppm	} Brown
Propane, Propylene	≥ 100 ppm	
Styrene	≥ 10 ppm	Yellow or Brown
Trichloroethylene	≥ 15 ppm	Pale brown
Gasoline	≥ 100 ppm	Brown
Toluene, Xylene	≥ 10 ppm	Purple

* Minimum concentration required to produce a response.

■ Polytec II (No.25)



Number of pump strokes : n=1

Sampling time : 1 minute per 1 pump stroke (100ml)

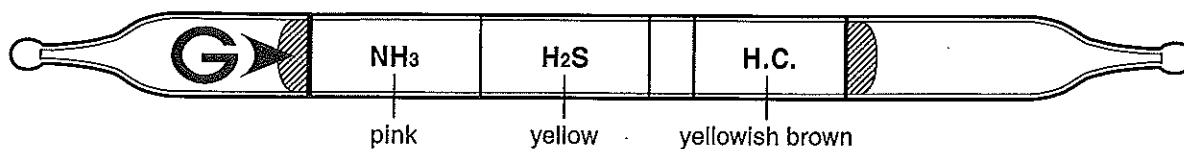
Shelf life : 2 years

Reaction principle : See the table below

Detecting layer		Name (Original colour)	NH ₃ or Amines (Pink)	SO ₂ (Blue)	H ₂ S (Pale blue)	CO (Yellow)
Reaction principle			$2\text{NH}_3 + \text{H}_2\text{SO}_4 \rightarrow (\text{NH}_4)_2\text{SO}_4$ or $2\text{R}\cdot\text{NH}_2 + \text{H}_2\text{SO}_4 \rightarrow (\text{R}\cdot\text{NH}_3)_2\text{SO}_4$	$\text{SO}_2 + \text{BaCl}_2 + \text{H}_2\text{O} \rightarrow \text{BaSO}_3 + 2\text{HCl}$ $\text{HCl} + \text{Base} \rightarrow \text{Chloride}$	$\text{H}_2\text{S} + \text{CuSO}_4 \rightarrow \text{CuS}$	$\text{CO} + \text{Na}_2\text{Pd}(\text{SO}_3)_2 \rightarrow \text{Pd}$
Substances & measurement results	Ammonia (0.5 ppm) (5 ppm)		Yellow (Inlet) Yellow (9 mm)			
	Hydrogen chloride (5 ppm)			Yellow (3 mm)		
	Chlorine (1 ppm)			Yellow (3 mm)		
	Sulphur dioxide (1 ppm) (2 ppm)			Yellow (Inlet) Yellow (6 mm)		
	Nitrogen dioxide (3 ppm)			Purple (Inlet)		
	Hydrogen sulphide (10 ppm)				Brown (Inlet)	
	Carbon monoxide (10 ppm)					Blackish brown (Inlet)
	Hydrogen (10000 ppm)					Blackish brown (Whole layer)
	Olefin HCs (10000 ppm)					Blackish brown (Whole layer)

Parenthesized values after substances show their concentrations, and those after the reaction colours show the lengths of their reaction colour layers.

■ Polytec III (No.26)



Number of pump strokes : $n=1$

Sampling time : 30 seconds per 1 pump stroke (100ml)

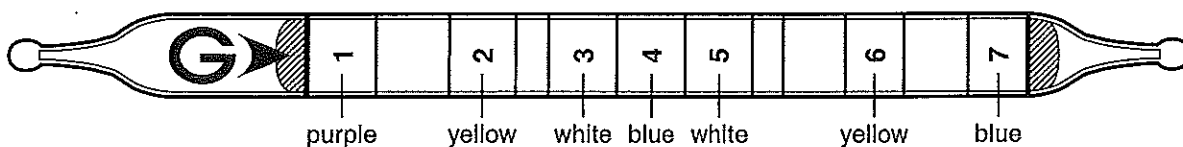
Shelf life : 2 years

Reaction principle : See the table below

Detecting layer		NH ₃ (Pink)	H ₂ S (Yellow)	HC (Yellowish brown)
Reaction principle		$2\text{NH}_3 + \text{H}_2\text{SO}_4 \rightarrow (\text{NH}_4)_2\text{SO}_4$ or $2\text{R} \cdot \text{NH}_2 + \text{H}_2\text{SO}_4 \rightarrow (\text{R} \cdot \text{NH}_3)_2\text{SO}_4$	$\text{H}_2\text{S} + \text{HgCl}_2 \rightarrow \text{HSHgCl} + \text{HCl}$ $\text{HCl} + \text{Base} \rightarrow \text{Chloride}$	$\text{CnHm} + \text{Cr}^{6+} + \text{H}_2\text{SO}_4 \rightarrow \text{Cr}^{3+}$
Substances & measurement results	Ammonia (0.5 ppm) (5 ppm)	Yellow (Inlet) Yellow (9 mm)		
	Hydrogen sulphide (0.5 ppm) (2 ppm)		Red (Inlet) Red (4 mm)	
	Sulphur dioxide (2 ppm)		Red (4 mm)	
	Hydrogen chloride (5 ppm)		Red (8 mm)	
	Chlorine (1 ppm)		Red (10 mm)	
	Nitrogen dioxide (3 ppm)		Red (4 mm)	
	Butane (500 ppm)			Dark brown (Whole layer)
	Gasoline (2 ppm) (20 ppm)			Greenish brown (Inlet) Greenish brown (Whole layer)
LPG (5000 ppm)			Dark brown (Whole layer)	

Parenthesized values after substances show their concentrations, and those after the reaction colours show the lengths of their reaction colour layers.

■ Polytec IV (No.27)



Detecting layer	No. Name (Original colour)	1	2
		NH ₃ (Purple)	HCl (Yellow)
Reaction principle		$3\text{NH}_3 + \text{H}_3\text{PO}_4 \rightarrow (\text{NH}_4)_3\text{PO}_4$	$\text{HCl} + \text{Base} \rightarrow \text{Chloride}$
Substances & measurement results	Ammonia, Diethylamine (25 ppm) (150 ppm)	Yellow (Inlet) Yellow (Whole layer)	
	Hydrogen chloride (5 ppm) (150 ppm) (*)		Red (Inlet) Red (Whole layer)
	Hydrogen sulphide (10 ppm) (120 ppm) (200 ppm) (800 ppm)		
	Chlorine (5 ppm) (20 ppm) (50 ppm)		
	Sulphur dioxide (10 ppm) (50 ppm)		
	Nitrogen dioxide (5 ppm) (30 ppm)		
	Acetylene (200 ppm) (2,000 ppm)		
	Carbon monoxide (25 ppm) (100 ppm)		
	Ethylene (10,000 ppm)		
	Phosphine (50 ppm) (700 ppm)		
	Hydrogen (50,000 ppm) (100,000 ppm)		
	Methyl mercaptan (200 ppm) (1,000 ppm)		
	Propylene (10,000 ppm) (50,000 ppm)		
Carbon dioxide (5,000 ppm) (20,000 ppm)			

Parenthesized values after substances show their concentrations.

Number of pump strokes : n=1

Sampling time : 30 seconds per 1 pump stroke (100ml)

Shelf life : 2 years (in the refrigerator)

Reaction principle : See the table below

	3 H ₂ S (White)	4 SO ₂ (Blue)	5 NO ₂ (White)	6 CO (Yellow)	7 CO ₂ (Blue)
	H ₂ S + CuSO ₄ → CuS	SO ₂ + BaCl ₂ + H ₂ O → 2HCl HCl + Base → Chloride	NO ₂ + C ₁₄ H ₁₆ N ₂ → C ₁₄ H ₁₄ N ₂ O	CO + Na ₂ Pd(SO ₃) ₂ → Pd	CO ₂ + 2KOH → K ₂ CO ₃
	Brown (Inlet) } Brown (Whole layer)			— — Faint dark brown Dark brown	
		Yellow (Inlet) } Yellow (Whole layer)	— Yellow (Inlet) Yellow (Whole layer)		
		Yellow (Inlet) Yellow (Whole layer)			
		} Purple (Whole layer)	Yellowish orange (Inlet) Yellowish orange (Whole layer)		
				Dark brown (Inlet) Dark brown (Whole layer)	
				Dark brown (Inlet) Dark brown (Whole layer)	
				Dark brown (Inlet)	
				Dark brown (Inlet) Dark brown (Whole layer)	
				Gray (Inlet) Dark brown (Whole layer)	
				Yellowish orange (Inlet) Yellowish orange (Whole layer)	
				Gray (Inlet) Gray (Whole layer)	
					Brown (Inlet) Brown (Whole layer)

(*) At relative humidity of 50 %. The detecting limit is lowered at a lower humidity or increased at a higher humidity.