


Application Note

Hydrogen Fluoride

Potential industries and applications for gas detection products

- Petroleum refining
- Glassmaking
- Aluminium manufacturing
- Metal finishing

Hydrogen Fluoride is a chemical compound with the formula HF. Together with Hydrofluoric Acid, it is the principal industrial source of Fluorine and hence the precursor to many important compounds including pharmaceuticals and polymers (e.g. Teflon). HF is widely used in the petrochemical industry and a component of many superacids. HF boils just below room temperature whereas the other Hydrogen halides condense at much lower temperatures. Aqueous solutions of HF, called Hydrofluoric Acid, are strongly corrosive.

Hydrogen Fluoride			
			
General			
Systematic Name	Hydrogen Fluoride		
Other Names	Fluoric Acid Hydrofluoride Hydrofluoric Acid Fluorine Monohydride		
Molecular Formula	HF		
CAS Number	7664-39-3		
Properties			
Vapour Density	0.7		
Melting Point	-84°C (190K, 118°F)		
Boiling Point	19.54°C (293K, 67.2°F)		
Toxic Exposure Levels			
EH 40 Workplace Exposure Limit (WEL)			
Long-term exposure limit (8-hour TWA reference period)		Short-term exposure limit (15-minute TWA reference period)	
ppm	mg.m⁻³	ppm	mg.m⁻³
1.8	1.5	3	2.5
OSHA Permissible Exposure Limit (PEL)			
Long-term exposure limit (8-hour TWA reference period)			
ppm	mg.m⁻³		
3	-		
ACGIH Threshold Limit Value			
8-hour TWA workday and a 40-hour workweek		3ppm (ceiling)	

Industrial Applications

HF is used for fluorinating polymers giving Fluorocarbons, petroleum refining, glassmaking, aluminium manufacturing, titanium pickling, quartz purification, and metal finishing. It is also used to synthesise UF₆, which is key to separating uranium isotopes.

Hydrogen Fluoride is used in:

- The glass etching, electronic, and chemical industries
- The production of aluminium and Chlorofluorocarbons (CFCs)
- Quartz purification
- Separating uranium isotopes, as a catalyst in the petroleum industry
- Titanium and stainless steel pickling

Hydrogen Fluoride is typically marketed in three common forms: Anhydrous HF, Aqueous 70% HF, Aqueous 49% HF. HF is manufactured by the reaction of Calcium Fluoride (fluorspar) and Sulphuric Acid.

HF immediately converts to Hydrofluoric Acid upon contact with moisture, including tissue. Hydrofluoric Acid is highly corrosive and toxic.

Honeywell Analytics' product offering



Our Product Range



Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- » Detection of flammable, oxygen and toxic gases (including exotics)
- » Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- » Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- » Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces.

These include:

- » Detection of flammable, oxygen and toxic gases
- » Single gas personal monitors – worn by the individual
- » Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- » Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- » Full technical support
- » Expert team on hand to answer questions and queries
- » Fully equipped workshops to ensure quick turnaround on repairs
- » Comprehensive service engineer network
- » Training on product use and maintenance
- » Mobile calibration service
- » Customised programmes of preventative/corrective maintenance
- » Extended warranties on products

Find out more

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