

Understanding Gases

Hydrogen Fluoride



HF

Hydrogen Fluoride (HF) is a colourless gas and/or fuming liquid which is used within the production of refrigerants, a range of pharmaceutical drugs, herbicides, plastics, electrical equipment and aluminium, to name a few.



When dissolved in water, the chemical compound becomes hydrofluoric acid.



Its uses include refrigerant manufacture for use in refrigerators and air conditioners as they are generally less ozone depleting than previously used CFCs.



And also as a very harsh cleaning agent to cut through heavy hydrocarbons when scouring the inside of large diameter pipes and assets in some oil extraction facilities.

What are the dangers of Hydrogen Fluoride?

Hydrogen Fluoride is one of the two most dangerous gas types we at Crowcon commonly detect, and it can cause substantial health issues to the human body. It does this by travelling into the skin and tissues, where it damages the cells, basically by tearing out metal atoms from the biological tissues. The extent of the impact depends on the severity of the ingestion, length of time of exposure and any medical issues the individual may have – which just make the symptoms worse or more immediate.

The first interaction of any gas is with the skin and often the eyes which can be considered as wet skin. HF is very harmful to them causing severe burns and skin ulcers, but as for all gases the main interaction with people is within the lungs and airways. HF can cause immediate, serious and often irreversible respiratory issues by severely damaging the lung tissue.

Due to its toxicity and the hazards involved in using it, HF and Hydrofluoric Acid need to be used and handled in line with health and safety best practices and regulations. OSHA set guidelines and exposure limits for those working in relevant environments (usually in industries and facilities) where hydrogen fluoride substances are used. OSHA set the Permissible Exposure Limit at 3 parts per million, across an 8-hour time period.

How do you detect Hydrogen Fluoride?

Hydrogen Fluoride can be detected through its smell, however by the time the smell has been recognised, health issues may have already occurred, and of course it is damaging the parts of the subject sensing the smell.

With this in mind, installing a reliable and effective gas detection system into the working environment is a must in order to accurately measure concentrations of the toxic gas. A fixed or portable detector is a recommended option depending on the needs of the operation. As this is one of the most dangerous gas types we detect we recommend very regular maintenance of any product used to detect it.

What should you do if you are exposed?

If exposed to Hydrogen Fluoride, fresh air should be introduced into the area immediately. Then the area should be evacuated, and those affected should remove soiled clothing and dispose of it. Then harmed areas of skin should be washed with large amounts of water.

Administering CPR should only be undertaken by trained individuals. Giving CPR to anyone who has swallowed HF could expose the rescuer to the chemical as well.



Colourless gas and/or fuming liquid



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