



HFC-125 CLEAN AGENT

APPLICATION/DESCRIPTION

HFC-125 fire suppression agent is an environmentally acceptable replacement for Halon 1301. HFC-125 has a zero ozone depleting potential, a low global warming potential, and a short atmospheric lifetime. It is particularly useful where an environmentally acceptable agent is essential, where clean-up of other media presents a problem, where weight versus suppression potential is a factor, where an electrically non-conductive medium is needed, and where people compatibility is an overriding factor. HFC-125 can be used to protect a wide range of applications from sensitive electrical equipment to industrial applications. Consult the current NFPA Standard 2001 and/or ISO 14520 for specific applications. HFC-125 fire suppression agent is used with Fike's total flooding systems.

HFC-125 is an odorless, colorless, liquefied compressed gas. (See Physical Properties Table for additional information). It is stored as a liquid and dispensed into the hazard as a colorless, electrically non-conductive vapor that is clear and does not obscure vision. It leaves no residue and has acceptable toxicity for use in occupied spaces at design concentration. HFC-125 extinguishes a fire by a combination of chemical and physical mechanisms. HFC-125 does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen deprivation.

Performance

HFC-125 is an effective fire extinguishing agent that can be used on many types of fires. It is effective for many surface fires and most solid combustible materials.

On a weight-of-agent basis, HFC-125 is a very effective gaseous extinguishing agent. The minimum design concentration for normal Class A combustibles protecting a total flood application is 8%, in accordance with NFPA 2001 and 8.7%, in accordance with ISO.

Specification

HFC-125 is of high organic purity and essentially residue-free, meeting the following quality specifications:

- Purity, % by weight: 99.0 Min.
- Moisture, ppm by weight: 10 Max.
- Acidity, ppm by weight, expressed as HCl: 0.1 Max.
- Residue, % by volume: 0.01 Max.

Toxicity

The toxicology of HFC-125 compares favorably with that of Halon 1301. The LC_{50} of HFC-125 is greater than 700,000 ppm which is equivalent to Halon 1301. HFC-125 has been evaluated for cardiac sensitization via test protocols approved by the United States Environmental Protection Agency. Test results show that cardiac tolerance to HFC-125 is much higher than that of Halon 1301 and will be acceptable for safe use in occupied space protection.

HFC-125 will decompose to form halogen acids when exposed to open flames. The formation of these acids is minimized by using Fike early warning detection systems and proper system installation. When properly applied and installed, the generation of these by-products by HFC-125 is minimal.

APPROVALS

HFC-125 complies with NFPA Standard 2001 - current edition. Fike ECARO-25 systems are Factory Mutual approved and UL listed for Clean Agent Fire Suppression Systems.

- UL Listed - Ex 4623
- FM Approved - 3014476

PHYSICAL PROPERTIES

- Chemical Name/Formula: Pentafluoroethane / CHF₂CF₃
- CAS Number: 354-33-6
- European Classification Number: EC-No.: 206-5578
- Molecular Weight: 120.02
- Vapor Density at 25° C (77°F) and 1 atm, kg/m³ (lb/ft³): 4.983 (0.3111)
- Vapor Pressure, Saturated at 25° C (77° F), bar (psia): 13 bar (200.4)
- Boiling Point, 1 atm, °C (°F): -48.14 (-54.7)
- Freezing Point, °C (°F): -103 (-153)
- Solubility in Water in FE-25 at 25°C (77°F), ppm: 700
- Critical Temperature, °C (°F): 66.25 (151.25)
- Critical Pressure, bar (psia): 36 (526.6 psi)
- Critical Volume cc/mole: 210
- Critical Density, kg/m³ (lb/ft³): 571.9 (35.70)
- Specific Heat, Liquid (C_p) at 25°C (77° F), KJ/Kg-°C (Btu/lb°F): 1.37 (0.327)
- Specific Heat, Vapor at (C_p) at 25°C (77° F), KJ/Kg-°C (Btu/lb°F) and 1 atm: 0.809 (0.193)
- Heat of Vaporization @ Boiling Point, KJ/Kg (Btu/lb): 164.4 (70.7)
- Thermal Conductivity, Liquid at 25°C (77° F), W/m-°C ((Btu/hr-ft°F): 0.0652 (0.0377)
- Thermal Conductivity, Vapor at 25°C (77° F), W/m-°C ((Btu/hr-ft°F): 0.0166 (0.0096)
- Viscosity, Liquid at 25°C (77° F), cP (lb/ft-hr): 0.137
- Viscosity, Vapor at 25°C (77° F), cP (lb/ft-hr): 0.013
- Ozone Depletion Potential: 0
- Global Warming Potential (based on a 100-year horizon relative to CO₂): 2800
- Estimated Atmospheric Lifetime*: 32.6 years
- Inhalation Exposure Limit (AEL-8 and 12hr. TWA), ppm**: 1000

* *Second Assessment Report (1995)-Intergovernmental Panel on Climate Change (IPCC).*

** *The acceptable exposure limit (AEL) is the 8-hr time weighted average (TWA) workplace exposure limit established by DuPont.*

