Fike® Corporation

HFC-227ea CLEAN AGENT

CATALOG NUMBER C.1.24.01

Architect and Engineer Specification

Clean Agent Suppression Systems with Solenoid Actuated Valve

APPLICATION

HFC-227ea fire suppression agent is the first environmentally acceptable replacement for Halon 1301. HFC-227ea 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-227ea can be used to protect a wide range of applications from sensitive electrical equipment to industrial applications using flammable liquids. Consult the current NFPA Standard 2001 for specific applications. HFC-227ea fire suppression agent is used with Fike's total flooding systems.

DESCRIPTION

HFC-227ea 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-227ea extinguishes a fire by a combination of chemical and physical mechanisms. HFC-227ea does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen deprivation.

PERFORMANCE

HFC-227ea is an effective fire extinguishing agent that can be used on many types of fires. It is effective for many surface fires, such as flammable liquids, and most solid combustible materials.

On a weight-of-agent basis, HFC-227ea is a very effective gaseous extinguishing agent. The HFC-227ea extinguishing concentration for normal Class A combustibles is appproximately 5.8 - 7% by volume. The minimum design concentration for total flood applications should be in accordance with NFPA 2001.

SPECIFICATION

HFC-227ea is manufactured to these specifications:

Mole%	99.0	Minimum
Acidity, ppm by weight	3.0	Maximum
Water content, % by weight	0.001	Maximum
Non-volatile residues, gram/100mL	0.05	Maximum

TOXICITY

The toxicology of HFC-227ea compares favorable with that of Halon 1301. The LC_{50} of HFC-227ea is greater than 800,000 ppm which is equivalent to Halon 1301. HFC-227ea 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-227ea is much higher than that of Halon 1301 and will be acceptable for safe use in occupied space protection. HFC-227ea 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-227ea should be minimal.

APPROVALS

HFC-227ea complies with NFPA Standard 2001 - current edition.

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PHYSICAL PROPERTIES OF HFC-227ea

Chemical Name	Heptafluoropropane (CF_3CHFCF_3)
Molecular Weight	170.03
Boiling Point @ 760 mm Hg	-16.4°C
Freezing Point	-131.1°C
Critical Temperature	101.7°C
Critical Pressure (psia)	29.1 bar
Critical Volume (cc/mole)	274
Critical Density (kg/m^3)	621
Specific Heat, Liquid (kj/kg @ 25°C)	1.184
Specific Heat, Vapor (kj/kg/°C) @ constant pressure of 1 ATM 25°C	0.808
Heat at Vaporization (kj/kg/°C) at Boiling Point	132.6
Thermal Conductivity (W/m°C) of Liquid @ 25°C	0.069
Viscosity, Liquid @ 25°C	0.184 centipoise
Vapor Pressure (kPa) @ 25°C	457.7
Ozone Depletion Potential	0
Est. Atmospheric Lifetime	31 - 42 years
LC_{50} (Rats; 4hrs - ppm)	>800,000