

FK-5-1-12 CLEAN AGENT

DESCRIPTION

FK-5-1-12 is a colorless, clear liquid (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. FK-5-1-12 extinguishes a fire by heat absorption. FK-5-1-12 does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen deprivation.

Chemical Name	Dodecafluoro-2-methylpentan-3-one
ASHRAE Designation	FK-5-1-12
Listings and Approvals	UL / ULC Listed and FM Approved
Features and Benefits	Clear, colorless liquid
	Stored as a liquid
	Electrically-nonconductive
	Discharges as a gaseous vapor (due to its relatively low boiling point)
	Zero ozone depleting potential
	Low global warming potential
	Included on the U.S. EPA Significant New Alternative Policy (SNAP) rules

EXTINGUISHING METHOD

FK-5-1-12 extinguishes a fire primarily through heat absorption. The gaseous mixture created when FK-5-1-12 discharges into air has a much higher heat capacity than air alone. The gaseous mixture absorbs large amounts of heat due to the high heat capacity and extinguishes fires by sufficiently cooling the combustion zone. It is important to note, FK-5-1-12 does not use the depletion of oxygen to extinguish a fire.



USE AND LIMITATIONS

System shall be used on the following Class of Hazards:	Class A & C: Electrical and Electronic Hazards Telecommunications Facilities High value assets, where the associated down-time would be costly
	Class B: Flammable liquids and gases
Systems shall NOT be used on fires involving the following materials:	Chemicals or mixtures of chemicals that are capable of rapid oxidation in the absence of air. (Examples include: Cellulose Nitrate and Gunpowder)
	Reactive metals such as Lithium, Sodium, Potassium, Magnesium, Titanium, Zirconium, Uranium, and Plutonium
	Metal hydrides such as Sodium Hydride and Lithium Aluminum Hydride
	Chemicals capable of undergoing auto-thermal decomposition. (Examples: Organic Peroxides and Hydrazine)

EXPOSURE LIMITATIONS

Hazard Type	Design Concentration	Maximum Human Expose Time
Normally Occupied Space	4.5% to 10.0%	5 minutes

Note: Fike does not recommend FK-5-1-12 systems to be used in any normally occupied spaces where the design concentration required is above 10%.

WARNING: The discharge of clean agent systems to extinguish a fire can result in potential hazard to personnel from the natural form of the clean agent or from the products of combustion that result from exposure of the agent to fire of hot surfaces. Unnecessary exposure of personnel either to the natural agent or to the products of decomposition shall be avoided.



PHYSICAL PROPERTIES OF FK-5-1-12

Chemical Name	Dodecafluoro-2-methylpentan-3-one
Chemical Formula	$\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$
CAS No.	756-13-8
Molecular Wt.	316.04
Boiling Point @ 1 atm (760 mmHg), °C (°F)	49 (120.2)
Melting Point, °C (°F)	-108 (-162.4)
Critical Temperature, °C (°F)	168.66 (335.6)
Critical Pressure, kPa (psia)	1865 (270.44)
Critical Density, kg/m^3 (lb/ft^3)	639.1 (39.91)
Density, Sat. Liquid, g/ml (lb/ft^3)	1.60 (99.9)
Density, Gas @ 1 atm, g/ml (lb/ft^3)	0.0136 (0.851)
Specific Heat, Liquid (C_p) @ 25°C (77°F), $\text{kJ/kg-}^\circ\text{C}$ ($\text{Btu/lb-}^\circ\text{F}$)	1.103 (0.2634)
Specific Heat, Vapor (C_p) @ 25°C (77°F), $\text{kJ/kg-}^\circ\text{C}$ ($\text{Btu/lb-}^\circ\text{F}$) and 1 ATM	0.891 (0.2127)
Vapor Pressure @ 25°C (77°F), kPa (psia)	40.4 (5.85)
Heat of Vaporization @ Boiling Point, kJ/kg (Btu/lb)	88 (37.8)
Thermal Conductivity, Liquid @ 25°C (77°F), $\text{W/m-}^\circ\text{C}$ ($\text{Btu/hr-ft-}^\circ\text{F}$)	0.059 (0.034)
Viscosity, Liquid (lb/ft-hr) @ 25°C (77°F), cP (lb/ft-hr)	0.524 (1.27)
Relative dielectric strength @ 1atm, 25°C ($N_2=1$)	2.3
Solubility of Water in FK-5-1-12 @ 70°F, ppm	< 0.001
Ozone Depletion Potential	0
Global Warming Potential, GWP (100 yr. ITH. For CO_2 , GWP = 1)	≤1