

## 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 an electrically non-conductive gaseous 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.

### Extinguishing Method

FK-5-1-12 extinguishes a fire by 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 or displacement of oxygen to extinguish a fire and therefore is safe for use in occupied spaces.

### Approvals

- Underwriters Laboratories (UL)
- Underwriters Laboratories of Canada (ULC)
- Factory Mutual (FM)
- United States EPA Significant New Alternative Policy (SNAP report)

*For exact certification listings, please reference the respective agency web site.*

### Use and Limitations

FK-5-1-12 system can 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

FK-5-1-12 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 such as 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 such as Organic Peroxides and Hydrazine

### Exposure Limitations

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 the fire or hot surfaces. Unnecessary exposure of personnel either to the natural agent or to the products of decomposition shall be avoided.

Hazard Type	Design Concentration	Maximum Human Exposure Time
Normally Occupied Space	4.5% to 10%	5 minutes

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%

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## Physical Properties

Chemical Name	Dodecafluoro-2-methylpentan-3-one
ASHRAE Designation	FK-5-1-12
Chemical Formula	CF <sub>3</sub> CF <sub>2</sub> C(O)CF(CF <sub>3</sub> ) <sub>2</sub>
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 <sup>3</sup> (lb/ft <sup>3</sup> )	639.1 (39.91)
Density, Sat. Liquid, g/ml (lb/ft <sup>3</sup> )	1.60 (99.9)
Density, Gas @ 1 atm, g/ml (lb/ft <sup>3</sup> )	0.0136 (0.851)
Specific Heat, Liquid (Cp) @ 25°C (77°F), kJ/kg-°C (Btu/lb-°F)	1.103 (0.2634)
Specific Heat, Vapor (Cp) @ 25°C (77°F), kJ/kg-°C (Btu/lb-°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), W/m-°C (Btu/hr-ft-°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 <sub>2</sub> =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 <sub>2</sub> , GWP = 1)	≤1

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