

3M™ Novec™ 1230 Fire Protection Fluid

Features

- UL/ULC Listed
- FM Approved
- Effective extinguishing performance on Class A, B and C fires
- People Safe at Concentration Levels Required to Extinguish Fire
- Zero Ozone Depletion Potential
- Atmospheric Lifetime of Five Days
- Colourless, Odourless, No Particulate or Oily Residue
- No Clean-up and Minimal Business Disruption After a Discharge
- Electrically Non-Conductive
- Small Quantity of Agent Required to Extinguish Fires
- Minimal claim of valuable floor space required in mission critical facilities

Product Overview

3M™ Novec™ 1230 Fire Protection Fluid, referenced as FK-5-1-12 in NFPA, EN and ISO documents, is a fluorinated ketone (or “Fluoroketone”) depicted by the chemical formula $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$.

It is colourless, odourless and electrically nonconductive. It is a liquid at room temperature, pressurized with Nitrogen and stored in high-pressure cylinders as part of the FSL CG4 Engineered Suppression System. Novec 1230 suppresses fire primarily by physical mechanisms due to its relatively high heat capacity with minimal impact on available oxygen. This allows hazard occupants to see and breathe, permitting them to safely exit the hazard area.

Environmental Impact

Novec 1230 Fluid is approved under the US EPA’s Significant New Alternatives Policy (SNAP) and is approved for use as an alternative to Halons for clean agent suppression in occupied spaces. Additional environmental properties are noted in Table 1.1.

Ozone Depletion Potential (ODP) ¹	0
Global Warming Potential (GWP) ²	1
Atmospheric Lifetime (Days)	5
SNAP Approved?	Yes

Table 1.1

Performance

Due to its relatively high heat capacity, Novec 1230 Fluid suppresses fires via its cooling effect. At sufficient concentration it causes the combustion zone to cool, limiting heat build-up and extinguishing the fire. Concentration requirements vary based on applicable international code and compliance requirements. Specific design concentration shall be specified by the system manufacturer.

Applications

As a clean agent, it leaves no residue behind and will not affect sensitive high-value electronics. Typical applications include:

- Telecommunication switch rooms
- Computer and electronic control rooms
- Hazards aboard ships
- Critical military applications

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Safety

The NOAEL (No Observable Adverse Effect Level) is measured at 10% for Novec 1230 fluid. This provides the largest margin of safety in occupied spaces of any of the contemporary halocarbon clean agents. In accordance with NFPA 2001; unnecessary exposure to clean agents should be avoided (See: NFPA 2001, Sect. 1-6, Safety).

Novec 1230 fluid has been evaluated for cardiac sensitization in accordance with test protocols approved by the Novec 1230 fluid has been judged acceptable by the U.S. EPA for use in occupied spaces when used in accordance with the guidance of NFPA 2001.

Although Novec 1230 fluid has negligible toxicity in concentrations required to suppress most fires, sufficient safety considerations must be observed when applying and handling the agent. Consult FSL Manuals and NFPA 2001 for additional guidance on safety.

Physical Properties

Although stored in liquid form, Novec 1230 fluid will transition to a gaseous state upon discharge properly designed mechanical impingement, which is achieved with FSL Discharge Nozzles. These properties make it an effective suppression agent for a variety of hazards.

Table 1.2 features typical chemical properties of Novec™ 1230 Fire Protection Fluid.

Chemical Formula	CF ₃ CF ₂ C(O)CF(CF ₃) ₂
Molecular Weight	316.04
Freezing Point	-162.4°F [-108°C]
Boiling Point at 1 Atm.	20.6°F [9.2°C]
Critical Temperature	335.6°F [168.7°C]
Critical Density	39.91 lb./ft. ³ [639.1 kg/m ³]
Critical Pressure	270.44 PSIA [1865 kPA]
Critical Volume	0.0251 ft. ³ /lbm [494.5 cc/mole]
Density, sat. liquid	99.9 lbm/ft ³ [1.60 g/ml]
Density, gas @ 1 atm	0.851 lbm/ft ³ [0.0136 g/ml]
Specific volume, gas @ 1 atm	1.175 ft ³ /lb [0.0733 m ³ /kg]
Liquid viscosity @ 32 °F [0 °C]/77 °F [25 °C]	0.56/0.39 centistokes
Heat of vaporization @ Boiling Point	37.9 BTU/lb [88.1 kJ/kg]
Solubility of H ₂ O in Novec 1230 liquid	<0.001% by wt.
Vapour pressure	5.85 psig [0.40 bar]
Dielectric strength relative to N ₂	2.3

Table 1.2

Ordering Information

Agent is ordered in half-kilogram (0.5 kg) increments and is currently only offered as part of an FSL 1230™ system assembly. Agent applicability for a hazard should be determined by trained personnel. Mass quantity is determined through calculation. Contact FSL for more information.