

### 3M™ Novec™ 1230 Fire Protection Fluid

Effective: September 2019  
K-45-0500 Rev AD

#### FEATURES

- **People Safe at Concentration Levels Required to Extinguish Fire**
- **Atmospheric Lifetime of Five Days**
- **Colorless, with Low Odor and No Particulate or Oily Residue Allowing for Minimal Business Disruption After a Discharge**
- **Electrically Non-Conductive**
- **Space Saving; Quantity of Agent Needed to Extinguish Fires Typically Required Minimal Cylinders, thus Minimal Space Required**
- **Zero Ozone Depletion Potential**
- **For Agency Approvals, see the "Compatibility" Table.**

#### EXTINGUISHING AGENT

3M™ Novec™ 1230 Fire Protection Fluid (herein referred to as "agent") is a fluorinated ketone (Dodecafluoro-2-methylpentan-3-one) compound of carbon, fluorine and oxygen ( $\text{CF}_3\text{CF}_2\text{C}(\text{O})\text{CF}(\text{CF}_3)_2$ ). It is colorless, electrically non-conductive and has a low odor. It suppresses fire primarily by physical mechanisms due to its relatively high heat capacity with minimal effect on the available oxygen. This allows people to see and breathe, permitting them to leave the fire area safely. The agent fluid is acceptable for use in occupied spaces when used in accordance with the United States Environmental Protection Agency (EPA) Significant New Alternatives Policy (SNAP) program rules.

Although the agent fluid is considered non-toxic to humans in concentrations necessary to extinguish most fires, certain safety considerations should be observed when applying and handling the agent. The discharge of the agent fluid may create a hazard to people from the decomposition products which result when the agent is exposed to fire or other hot surfaces. Exposure to the agent is generally of less concern than is exposure to the decomposition products. Unnecessary exposure to the agent or the decomposition products should be avoided.

#### TOXICITY

Unnecessary exposure to clean agents is to be avoided in accordance with the requirements of NFPA-2001. As such, upon operation of a system pre-discharge alarm, all personnel should immediately exit the protected space. In no case shall personnel remain in a room in which there is a fire. In the very unlikely instance where a clean agent system should discharge unexpectedly into an occupied room, all personnel should proceed in a calm and orderly manner to an exit and leave the room.

The agent fluid has been evaluated for cardiac sensitization in accordance with test protocols approved by the United States Environmental Protection Agency (U.S. EPA). The EPA's SNAP Program classifies the agent fluid as acceptable for use as a total flooding agent in occupied spaces with specific limitations. Refer to the SNAP program rules or NFPA 2001 for more information. The agent 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. In accordance with NFPA 2001, the agent fluid designed for use with agent vapor concentrations up to ten volume percent in air are permitted. See NFPA 2001, Sect. 1-5, *Safety*.

Although the agent fluid has negligible toxicity in concentrations needed to suppress most fires, certain safety considerations must be observed when applying and handling the agent. For example, the agent fluid is a liquid at room temperature and has been superpressurized with dry nitrogen. Upon release to atmospheric pressure (e.g., from nozzles) the liquid flash evaporates at a low temperature. Thus, nozzles must be located to avoid direct impingement on personnel.

#### DECOMPOSITION

When the agent fluid is exposed to high temperatures, such as what may be expected in a flame front, hazardous products of thermal decomposition (halogen acids) are produced. If the agent fluid is discharged in 10 seconds or less, flames will be extinguished rapidly and the amount of by-products produced will be minimal.

#### CLEANLINESS

The agent fluid is clean and leaves no residue, thereby eliminating costly after-fire clean-up and keeping expensive downtime to a minimum. Most materials such as steel, stainless steel, aluminum, brass and other metals as well as plastics, rubber and electronic components are unaffected by exposure to the agent fluid.

#### APPROVALS

The agent fluid complies with the NFPA Standard 2001, Standard for Clean Agent Fire Extinguishing Systems, EPA SNAP Program, (Significant New Alternate Policy), Underwriters Laboratories, Inc. (UL) FM Approvals (FM).

#### USE

Kidde Fire Systems Fire Suppression Systems designed for use with the agent are designed to extinguish fires in specific hazards or equipment located where an electrically non-conductive agent is required, where agent cleanup creates a problem, where extinguishing capability with low weight is a factor and where the hazard is normally occupied by personnel. The agent fluid is an acceptable alternative to Halon and is approved by the EPA and NFPA for use in fire suppression systems.

**Note:** Replaces Datasheet K-45-1900.

**Table 1: Agent Fluid  
Physical Properties**

Chemical Formula	CF <sub>3</sub> CF <sub>2</sub> C(O)CF(CF <sub>3</sub> ) <sub>2</sub>
NFPA Reference	Dodecafluoro-2-methylpentan-3-one
Molecular Weight	316.04
Freezing Point	-162.4°F (-108°C)
Boiling Point at 1 Atm.	120.6°F (49.2°C)
Critical Temperature	335.6°F (168.7°C)
Critical Density	39.91 lb./ft. <sup>3</sup> (639.1 kg/m <sup>3</sup> )
Critical Pressure	270.44 PSIA (1865 kPa)
Critical Volume	0.0251 ft. <sup>3</sup> /lbm (494.5 cc/mole)
Ozone Depletion Potential	0
Global Warming Potential	1

**Table 2: Agent Fluid  
Toxicity Properties**

NOAEL (No Observable Adverse Effect Level)	10.0%
LOAEL (Lowest Observable Adverse Effect Level)	>10.0%

**COMPATIBILITY**

System	Industrial Approval	Marine Approval
ECS-500™ System	UL, ULC, FM	UL, USCG
ECS™ 360 with 3M™ Novec™ 1230 Fire Protection Fluid	UL, ULC, FM	UL, USCG
ADS™ with 3M™ Novec™ 1230 Fire Protection Fluid	UL, ULC, FM	UL, USCG

**DESIGN CONCENTRATION NOTES**

- NFPA Listed Minimum Design Concentration MDC) for Class A and Class C Fires (less than 480 volts) = 4.5%
- Design concentrations for Class B Fire are shown in the right column table. The MDC is equal to the Cup Burner (vol %) x 1.3 but not less than 5.85% in accordance with the UL-2166 and FM 5600 requirements that the Class B design concentration cannot be less than that based on heptane.

**EXPORT INFORMATION (USA)**

Jurisdiction: EAR  
Classification: EAR99  
This document contains technical data subject to the EAR.

All trademarks are property of their respective owners.  
3M and Novec are trademarks of 3M Company.

Fuel	MDC, % v/v
1-Butane	6.37
1-Propanol	7.02
2,2,4-trimethylpentane	6.11
2-butoxyethanol	6.76
Acetone	5.85
Acetonitrile	5.85
Commercial Heptane	5.85
Commercial Hexanes	5.85
Cyclohexane	5.85
Cyclopentanone	5.98
Denatured Alcohol (92.2% EtOH, 4.6% IPA, and 3.1% MeOH)	6.89
Diesel Fuel	5.85
Diethyl Ether	6.37
Ethanol	7.15
Ethyl Acetate	6.11
Gasoline-87 oct. unleaded	5.85
Hexene	5.98
Isooctane	6.11
Isopropanol Alcohol	6.37
Methane	7.28
Methanol	8.45
Methyl Ethyl Ketone	5.85
Methyl Isobutyl Ketone	5.85
Methyl Tert Butyl Ether	5.95
n-Heptane	5.85
n-Pentane	6.11
Octane	5.85
Propane	7.54
Pyrrrolidine	6.11
Technical Heptane	5.85
Tetrahydrofuran	6.50
Toluene	5.85
Transformer Oil	5.85

This literature is provided for informational purposes only. KIDDE-FENWAL, INC. believes this data to be accurate, but it is published and presented without any guarantee or warranty whatsoever. KIDDE-FENWAL, INC. assumes no responsibility for the product's suitability for a particular application. Product features specified are only applicable when the fire suppression system is correctly designed, installed, maintained and serviced by trained, authorized Kidde Fire Systems distributors as per the applicable design, installation, operation, and maintenance manuals. If you need more information on this product, or if you have a particular problem or question, contact: KIDDE-FENWAL, INC., Ashland, MA 01721 USA, Telephone: (508) 881-2000.