

3M™ Novec™ 1230 Fire Protection Fluid

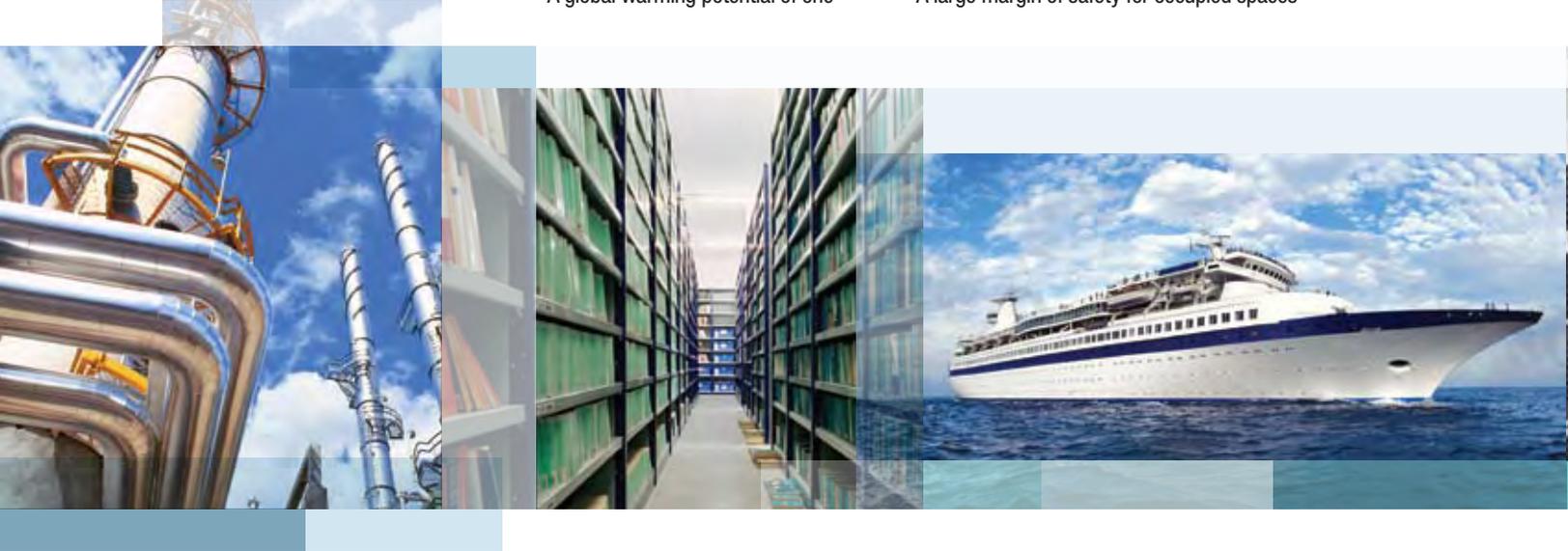


Created
for Life

3M

3M™ Novec™ 1230 Fire Protection Fluid is a next-generation halon replacement, designed to alleviate concerns for human safety, performance and the environment. Unlike first-generation HFCs, Novec 1230 fluid has the key features defining sustainable clean agent protection:

- Zero ozone depletion potential
- A global warming potential of one
- Five-day atmospheric lifetime
- A large margin of safety for occupied spaces



Novec 1230 fluid was created for life: for the life of your people, to help keep them safe from fire and chemical hazards; for the life of your equipment, to effectively protect it from fire; and for the life of your system, so it not only meets today's environmental regulations but those of the foreseeable future.

A
new way
to put out
fires



A long-term, sustainable technology

With zero ozone depletion potential, extremely low global warming potential and short atmospheric lifetime, Novec 1230 fluid is the first chemical halon replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

Environmental Properties

	Novec 1230	Halon 1211	Halon 1301	HFC-125	HFC-227ea
Ozone Depletion Potential ¹	0.0	4.0	12.0	0.0	0.0
Global Warming Potential ²	1	1890	7140	3500	3220
Atmospheric Lifetime (Years)	0.014	16	65	34.2	29
SNAP (Yes/No)	Yes	N/A	N/A	Yes	Yes

¹World Meteorological Organization (WMO) 1998, Model-Derived Method

²Intergovernmental Panel on Climate Change (IPCC) 2007 Method, 100-year 1TH



Today's largest margin of safety

Because its use concentration is much lower than its No Observable Adverse Effects Level (NOAEL), Novec 1230 fluid offers the largest margin of safety of any chemical halon replacement available on the market today. Note: Industry standards require egress from a protected enclosure prior to system discharge.

Safety Margin

Agent	Novec 1230	Halon 1301	HFC-125	HFC-227ea
Use Concentration	4-6%	5%	8.7-12.1%	7.5-8.7%
NOAEL ³	10% ⁴	5%	7.5%	9%
Safety Margin	67-150%	Nil	Nil	3-20%

³NOAEL for cardiac sensitization

⁴NOAEL for acute toxicity, including cardiac sensitization



Major global regulatory requirements have been addressed. Novec 1230 fluid can be easily shipped to meet global demand.

Regulatory Status

3M™ Novec™ 1230 Fire Protection Fluid

USA	TSCA: product complies with chemical notification requirements SNAP: approved for flooding (12/20/02) and streaming (1/23/03)
Europe	ELINCS: product complies with chemical notification requirements
Canada	CDSL: product complies with chemical notification requirements
Korea	KECI: product complies with chemical notification requirements
Australia	AICS: product complies with chemical notification requirements
Japan	METI: product complies with chemical notification requirements
China	CICS: product complies with the chemical notification requirements

Introducing the

3M™ Blue SkySM Warranty

20-Year protection
against regulatory bans
or restrictions on the use
of 3M™ Novec™ 1230
Fire Protection Fluid

**When it comes
to environmental
regulations,
3M gives you a
clear advantage.**

3M™ Novec™ 1230 Fire Protection Fluid doesn't just put out fires. With the new 3M™ Blue SkySM Warranty, it also puts your mind at ease. Today's world is full of changes designed to help ensure a better tomorrow. But managing the risks created by these changes is challenging. Fortunately 3M understands your challenges and has the answer you're looking for with the 3M™ Blue SkySM Warranty.

Here's how it works: if Novec 1230 fluid is banned from or restricted in use as a fire protection agent due to ozone depletion potential or global warming potential, 3M will refund the purchase price of the fluid. That's a promise and performance you can take to the bank.

For complete details on this program, please contact your 3M representative, or visit www.3M.com/novec1230fluid

A
new way
to put your
mind
at ease

One fire protection fluid. So many reasons to use it.

Here is the new standard for halon replacement. Novec 1230 fluid offers a long-term, sustainable technology that has the greatest margin of safety, the lowest GWP for chemical clean agent alternatives, and zero ozone depletion potential.

What is Novec 1230 fluid?

Novec 1230 fluid is a fluoroketone – a proprietary 3M technology that offers a number of important advantages over conventional halon replacements.

How does it work?

Extinguishing via its cooling effect, Novec 1230 fluid works as a gas, yet it is a liquid at room temperature. Because it is not packaged under pressure, Novec 1230 fluid has unique shipping and handling advantages over high pressure alternatives. Novec 1230 fluid systems allow for more efficient use of space compared to inert gas systems.

Where is Novec 1230 fluid used?

Novec 1230 fluid is a highly efficient fire extinguishant that can be used for flooding applications in engineered and pre-engineered systems.

It is ideal for special hazards: spaces where the continuous operation of high-value equipment is paramount. Examples include: telecommunication switch rooms, computer and electronic control rooms, hazards aboard ships and critical military applications such as vehicle engine and crew bay protection. It is also ideal for environments such as libraries, cultural facilities, storage rooms, archives and museums, where valuable items must not be damaged by a fire extinguishing agent.

What sets it apart?

Novec 1230 fluid has zero ozone depletion potential and the lowest atmospheric lifetime for chemical clean agent alternatives: 5 days. The next closest halon alternative is 29 years.

Novec 1230 fluid has a Global Warming Potential of 1 which is 99.9% lower than any halocarbon agent acceptable for use in occupied spaces.

Novec 1230 fluid has the largest margin of safety for use in occupied spaces.

It makes good business sense to use Novec 1230 fluid because it is a sustainable, long-term technology. Not only does Novec 1230 fluid meet today's regulations but it meets those of the foreseeable future.

Novec 1230 fluid is supported by global sales, technical and customer service resources, with fully-staffed technical service laboratories in the U.S., South America, Europe, Middle East, Japan and Southeast Asia.



Typical Physical Properties (Not for specification purposes)

3M™ Novec™ 1230 Fire Protection Fluid

Chemical formula	CF ₃ CF ₂ C(O)CF(CF ₃) ₂
Molecular weight	316.04
Boiling point @ 1 atm	49.2°C (120.6°F)
Freezing point	-108°C (-162.4°F)
Density, sat. liquid, 25°C	1.60 g/ml (99.9 lbm/ft ³)
Density, gas @ 1 atm, 25°C	0.0136 g/ml (0.851 lbm/ft ³)
Specific volume @ 1 atm, 25°C	0.0733 m ³ /kg (1.175 ft ³ /lb)
Liquid viscosity @ 0°C/25°C	0.56/0.39 centistokes
Heat of vaporization @ BP	88.0 kJ/kg (37.9 BTU/lb)
Solubility of H ₂ O in Novec 1230 fluid	<0.001% by wt.
Vapor pressure @ 25°C	0.404 bar (5.87 psig)
Relative dielectric strength @ 1 atm (N ₂ =1.0)	2.3



The 3M™ Novec™ Brand Family

The Novec brand is the hallmark for a variety of patented 3M products. Although each has its own unique formula and performance properties, all Novec products are designed to address the need for safe, effective, sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, lubricant deposition and several specialty chemical applications.

3M™ Novec™ Engineered Fluids • 3M™ Novec™ Aerosol Cleaners • 3M™ Novec™ 1230 Fire Protection Fluid • 3M™ Novec™ Electronic Coatings • 3M™ Novec™ Electronic Surfactants

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