

3M™ Novec™ 1230 Fire Protection Fluid  
For Telecommunications and Data Center Applications



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3M™ Novec™ 1230 Fire Protection Fluid is an advanced “clean agent” fire suppression material, used to protect high-value assets such as computers, switching equipment, cameras, disk arrays and other critical devices. By definition, clean agents do not leave a residue behind when they discharge, so they do not damage sensitive electronics. They are also electrically non-conductive. This means that fires involving energized electrical equipment can be extinguished without powering down – avoiding expensive service interruptions and data loss.

Based on a patented chemistry from 3M, Novec 1230 fluid offers a number of important advantages over conventional clean agents such as inert gas and CO<sub>2</sub>. For example, Novec 1230 fluid allows for more efficient use of floor space – requiring only about one-fourth or fewer of the number of cylinders used in a CO<sub>2</sub> or inert gas system, adding significantly less weight to floor loads. Having fewer cylinders also results in a system that is less complex, and typically less costly to install and maintain.

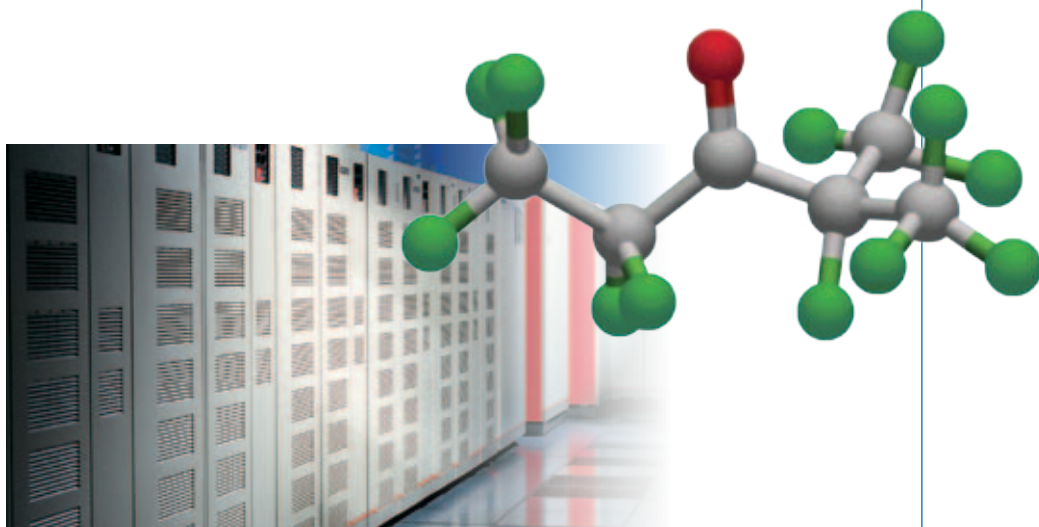
Equally important, Novec 1230 fluid offers zero ozone depletion potential, a 5-day atmospheric lifetime and a global warming potential of 1 – an environmental profile that hydrofluorocarbons (HFCs) and other halocarbon agents can't begin to match. Because of this, Novec 1230 fluid – unlike HFCs – is not targeted for phase-down or regulatory restrictions anywhere in the world, making it today's sustainable choice for clean agent fire protection.

# Engineered to keep your operations safe, secure, connected



Novec 1230 fluid is designed to alleviate concerns for the environment – with key properties that have re-defined “sustainability” in clean agent fire protection:

- Zero ozone depletion potential
- Five-day atmospheric lifetime
- A global warming potential of one



3M™ Novec™ 1230 Fire Protection Fluid is a fluoroketone – a proprietary 3M technology that works as a gas upon discharge, yet it is a liquid at room temperature. It is a highly efficient fire extinguishant that can be used for total flooding applications in engineered and pre-engineered systems. It is ideal for environments such as switching centers, computer rooms, control rooms and data centers where uninterrupted operation is critical.

#### Case in Point

A major media group in the U.K. was investigating fire protection options for its building's basement area, which houses uninterruptible power supplies, and the second floor where the servers and communication equipment are located. After initially considering an inert gas system, which would have required complex venting, pipework and considerable floor space to house the gas cylinders, the company ultimately selected a system using 3M Novec 1230 Fire Protection Fluid. This not only saved floor space and simplified installation, but also provided a wide margin of safety for occupied areas and satisfied the company's desire for an environmentally sustainable system.



#### Case in Point

A Texas firm providing off-site storage of electronic files is employing modular media storage vaults protected by 3M Novec 1230 Fire Protection Fluid-based systems. In addition to requiring a clean agent that will not damage sensitive electronic files and other valuable documents, the firm felt that Novec 1230 fluid offered the most environmentally sustainable option of any available chemical clean agent.

### Fire protection for green buildings

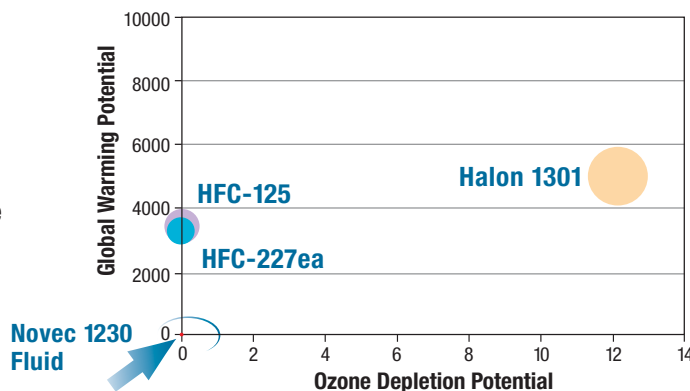
The LEED® Green Building Rating System™, founded and administered by the United States Green Building Council, is a third-party certification system designed to encourage sustainable building and development practices. Because 3M™ Novec™ 1230 Fire Protection Fluid enables facilities managers to effect a 99% reduction in greenhouse gases in critical function fire suppression, its use may make it possible to claim LEED Innovation Credits.

Additional information about 3M Novec 1230 Fire Protection Fluid, including how it can help earn credits toward LEED certification, is available at [www.3M.com/novec1230fluid](http://www.3M.com/novec1230fluid).

## Created for life

3M™ Novec™ 1230 Fire Protection Fluid helps address the global demand for a clean agent fire protection that offers a wide margin of safety, is effective and is not targeted for emission reduction, phase-out or phase-down. Novec 1230 fluid has zero ozone depletion potential, a short atmospheric lifetime of 5 days and a global warming potential of 1 – about the same as naturally-occurring carbon dioxide. It is the first halocarbon clean agent to offer a viable, long-term sustainable technology for special hazards fire protection in the telecommunications and data center industries.

Comparing the environmental footprints of halogenated fire extinguishing compounds



In this graphic, the horizontal “X” axis indicates ozone depletion potential, while the vertical “Y” axis shows global warming potential. The area of the circle is proportional to the atmospheric lifetime of the agent: the larger the circle, the longer it will reside in the atmosphere. The least possible environmental impact would be indicated by a small dot at the point where the X and Y axes intersect. As shown here, Novec 1230 fluid—with zero ozone depletion potential, a global warming potential of 1 and an atmospheric lifetime of 5 days—comes closest to meeting this ideal.



## An environmentally-sustainable technology...

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

Properties	Novec 1230	HFC-125	HFC-227ea
Ozone Depletion Potential (ODP) <sup>1</sup>	0.0	0.0	0.0
Global Warming Potential—IPCC <sup>2</sup>	1	3500	3220
Atmospheric Lifetime (Years)	0.014 (5 days)	29	34.2

<sup>1</sup> World Meteorological Organization (WMO) 1998, Model-Derived Method.

<sup>2</sup> Intergovernmental Panel on Climate Change (IPCC) 2007 Method, 100 Year 1TH, CO<sub>2</sub> = 1.

## ...with a margin of human safety surpassing all chemical agents and CO<sub>2</sub>

### 3M™ Novec™ 1230 Fire Protection Fluid Safety Margin—Class B Hazards

Agent	Novec 1230	HFC-125	HFC-227ea	CO <sub>2</sub>
Use Concentration <sup>1</sup>	4.2-5.9%	8.7-12.1%	6.25-8.7%	30-75%
NOAEL <sup>2</sup>	10%	7.5%	9%	<5%
Safety Margin	69-138%	nil	3-44%	Lethal at design concentration

<sup>1</sup> 2008 NFPA 2001 and NFPA 12

<sup>2</sup> NOAEL for cardiac sensitization (halocarbons) and effects specific to CO<sub>2</sub>

#### Case in Point

In designing a new fire protection system for a large department store chain, a key concern was to ensure continuity of operations for the client's communication and computer systems. The customer required a clean agent that would be effective against fires, residue-free and harmless to sensitive equipment, but without the environmental drawbacks of HFCs or the safety concerns of other kinds of extinguishants.

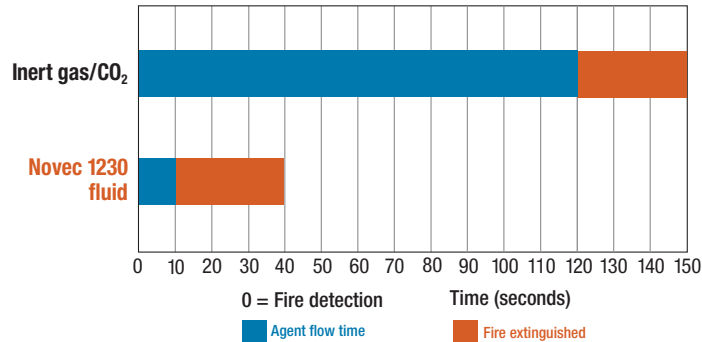
By installing a system designed for use with Novec 1230 fluid, the system provider for the department store chain was able to meet those difficult challenges.



## Fast, effective fire protection for electronics, cable vaults, archives and other valuable assets



### Engineered for fast extinguishment



Novec 1230 fluid knocks down fires in less than half the time of CO<sub>2</sub> agents. Fast extinguishment helps keep fires small, giving them less chance to spread. Generally, a system using Novec 1230 fluid will extinguish a fire even before it reaches the “flame” stage.

In addition to its favorable safety and environmental profiles, Novec 1230 fluid is a highly-effective fire extinguishant, designed to suppress fires quickly – without powering down and without disrupting communications. This is an especially critical consideration for industries where even brief transmission disruptions can result in substantial monetary losses. These disruptions can also be life-threatening, as in the case of police and fire services, traffic control, weather forecasting, aviation and other critical communication services.

Industry	Hourly cost of downtime	Lost revenue per employee
Telecommunications	\$2,066,245	\$187
Finance/Brokerage	\$1,495,134	\$1,080
Information Technology	\$1,344,461	\$184
Insurance	\$1,202,444	\$371
Retail	\$1,107,274	\$244
Banking	\$996,802	\$131

Source: IT Performance Engineering & Measurement Strategies: Quantifying Performance Loss, Meta Group, October 2000.

## Regulatory Status

3M Novec 1230 fluid is approved for use in commercial and industrial total flooding systems by the U.S. EPA and most major regulatory bodies around the world. The product complies with chemical notification requirements in the following regions:

- United States
  - Europe
  - Canada
  - Korea
  - Australia
  - Japan
- ✓ **Approved globally for total flooding without restriction**
- ✓ **Dramatically reduces the climate footprint of the global fire protection industry.**

# 3M™ Blue Sky<sup>SM</sup> 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

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 Sky<sup>SM</sup> 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](http://www.3M.com/novec1230fluid).

A  
new way  
to put your mind  
at ease

The high global warming potential and atmospheric persistence of halon replacements such as HFCs are leading to concerns about whether their use will continue to be permitted. For example, F-Gas Regulations that have been introduced in Europe impose requirements specific to HFCs for technician training, inspections, testing, and reporting. It is likely that HFCs may follow the halon extinguishing agents that were so popular until the 1980s, when they became restricted, and are now banned from being manufactured and are being phased out in end use in many countries.

Measures addressing the use of HFCs are also being drafted in the USA. The U.S. House of Representatives has passed legislation that would phase down the production of HFCs. Similar measures are also being considered at an international level. Proposals have been advanced to phase-down HFC production under the Montreal Protocol. In addition, a proposed early action item identified under the California Global Warming Solutions Act of 2006 includes a consideration that, from 2012, all new fire protection systems in California must use an agent with a global warming potential below a minimum threshold level.

The California Air Resources Board (CARB) proposal and U.S. House bill reflect the regulators' concern that, while emissions from this sector are currently low, the installation base is growing quickly and the emission potential of this installed base represents a significant future liability. Thus, the only meaningful way to limit this future liability is to reduce the use of HFCs.

That's why 3M offers you the peace-of-mind made possible by our exclusive 3M™ Blue Sky<sup>SM</sup> Warranty.

## 3M Resources

3M™ Novec™ 1230 Fire Protection Fluid is supported globally by 3M sales, technical and customer service resources, as well as by authorized fire suppression system manufacturers (OEMs).

For more information, please visit our web site at

[www.3M.com/novec1230fluid](http://www.3M.com/novec1230fluid).

### 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 in common 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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### Electronics Markets Materials Division

3M Center, Building 224-3N-11  
St. Paul, MN 55144-1000  
[www.3M.com/novec](http://www.3M.com/novec)  
1-800-810-8513

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