



**Novec**<sup>™</sup>

Brand

# 3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid Frequently Asked Questions (FAQs)

## Smart Performance FAQs

---

**Q: What is 3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid?**

**A:** 3M<sup>™</sup> Novec<sup>™</sup> 1230 fluid is a sustainable (zero ozone depletion potential, less than 1 global warming potential) fire extinguishing clean agent that helps protect continuity of operations and high value assets. It is a waterless fire suppressant designed to replace high global warming potential (GWP) hydrofluorocarbons (HFCs) like FM-200®.

3M<sup>™</sup> Novec<sup>™</sup> 1230 fluid is a clean agent included in the NFPA 2001 and ISO 14520 standards. It is non-conductive and leaves no residue, putting out fires while helping preserve both assets and operations. Novec 1230 fluid has been used for clean agent fire suppression for over 20 years in more than 90 countries. Its proven quality and reliability have provided specifiers and end-users with a smart solution for their clean agent needs.

Download the [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid brochure](#) (PDF, 1.4 mb), [the technical data sheet](#) (PDF, 510 kb), or visit the [webpage](#) to learn more.

**Q: What operations and valued assets is 3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid used to protect?**

**A:** 3M<sup>™</sup> Novec<sup>™</sup> 1230 fluid helps protect continuity of operations because, unlike water, it does not damage electronic equipment and the critical data stored on it—to help keep your business up and running. It also helps protect valuable assets including everything from paper archives and historical documents to priceless works of art and artifacts. To learn more about specific industry applications, download one of our brochures.

- [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid for Telecomm & Data Centers](#) (PDF, 1464 kb)
- [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid Oil & Gas](#) (PDF, 923 kb)
- [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid Flightline Applications](#) (PDF, 699 kb)
- [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid Marine Application](#) (PDF, 1086 kb)
- [3M<sup>™</sup> Novec<sup>™</sup> 1230 Fire Protection Fluid Museums & Archives](#) (PDF, 765 kb)

**Q: Where are systems using 3M Novec 1230 fluid typically installed?**

**A:** Systems using Novec 1230 fluid are often installed to protect critical operations and high value assets such as data centers, computer rooms, control rooms, museums, archives or any other location where the use of water to control a fire would damage the asset being protected and interrupt critical operations. Because Novec 1230 fluid has the highest known margin of safety for people of any NFPA 2001 or ISO 14520 clean agent, it is also often used in rooms with occupants where safety is important. For system installation examples across a range of critical industries, view a [selection of case studies](#).

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

**Q: Are there any examples of fire suppression systems using 3M™ Novec™ 1230 Fire Protection Fluid in my industry?**

**A:** Yes, there are many case studies showing successful installation of system using Novec 1230 fluid in industries including:

- Industrial/Manufacturing
- Marine
- Hospitals
- Data Centers
- Flightline/Aviation
- Military
- Transit
- Power Generation and Transmission
- Oil and Gas

For case studies appropriate to your country:

- **In the United States:** Visit our [fire suppression case study web page](#).
- **Outside the United States:** Visit your country's 3M fire suppression web page or contact your local 3M sales representative for information tailored to your country.

**Q: How is 3M™ Novec™ 1230 fluid applied to a fire?**

**A:** Upon manual or automatic detection system activation, 3M™ Novec™ 1230 fluid is released through a specially designed extinguishing nozzle. It vaporizes immediately and reaches design concentration within 10 seconds, and can quickly extinguish Class A, B and C fires.

**Q: How does 3M™ Novec™ 1230 fluid extinguish a fire?**

**A:** 3M™ Novec™ 1230 fluid stops the combustion process by absorbing heat. As part of an advanced fire suppression system, it can quickly extinguish Class A, B and C fires. Unlike CO<sub>2</sub> and inert gases, Novec 1230 fluid does not extinguish a fire by displacing the oxygen in an enclosure.

**Q: Is 3M™ Novec™ 1230 fluid a liquid or a gas?**

**A:** Actually, it is both. 3M™ Novec™ 1230 fluid is produced and stored as a liquid. However, upon discharge from a properly designed spray nozzle, it floods the protected space as a gas. This fire suppressant evaporates 50 times faster than water, so the energy of the discharge is more than sufficient to vaporize it. The gas extinguishes the fire and helps prevent re-ignition of the potential fire incident. (The term “fluid” can be used to describe either a liquid or a gas.)

Learn more about the science behind [3M Novec 1230 fluid's transformation from liquid to gas](#) (PDF, 51 kb).

**Q: Does the noise from a system discharging 3M™ Novec™ 1230 fluid cause damage to hard disc drives?**

**A:** Damage to hard disc drives has not been known to happen as a result of a discharge of a system using Novec 1230 fluid. For inert gas systems, noise at specific decibel levels and frequencies has been tied to HDD damage. Instances have been reported in [Sweden](#), [Romania](#) and [Australia](#), among other locations. Volume, tone and duration of the noise are all important factors. The duration of discharge for inert gas systems is up to 12 times longer than halocarbon systems, such as those that use Novec 1230 fluid. Efforts are now underway to design inert gas systems to minimize noise at the nozzle.

Learn more in the [Clean Extinguishing Agent System Noise and Hard Disk Drive \(HDD\) Failure FAQs](#) (PDF, 111 kb).

**Q: What are the advantages of using 3M™ Novec™ 1230 fluid compared to inert gas?**

**A:** Owners of inert gas systems have become keenly aware of the hidden costs of installing, housing, maintaining and recharging inert gas systems.

On a volume basis, inert gas systems must deliver more agent into a room to displace as much as 40% of the air in a protected space—compared to approximately 5% with a system using 3M™ Novec™ 1230 fluid. This translates into

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

many more cylinders of inert gas required to protect a given space. In addition, the cylinders store gas at much higher pressures.

Both the greater number of cylinders and the high pressures at which these systems operate represent additional expenses, or “extra” installation costs that may not be readily apparent in the initial bid. For example, the added construction costs associated with pressure relief methods to offset over-pressurization of the protected space may not be included in the cost of system installation, but are necessary expenses associated with installation. In addition, the larger amount of space required for the higher quantity of inert gas cylinders translates to higher real estate or space costs.

The high pressure at which inert gas systems operate also requires more frequent and rigorous maintenance to ensure that it can withstand the high discharge pressures. At regular intervals, maintenance teams validate system pressure and the integrity of the hoses, pressure vents, and cylinders.

Learn more about:

- [The hidden costs of installing inert gas fire suppression systems](#) (PDF, 115 kb)
- [The hidden real estate costs of inert gas fire suppression systems](#) (PDF, 128 kb)
- [The hidden maintenance costs of inert gas fire suppression systems](#) (PDF, 117 kb)
- [The hidden costs of recharging inert gas fire suppression systems](#) (PDF, 110 kb)

## Safety FAQs

### Q: Is this product safe for human occupancy?

A: Yes. 3M™ Novec™ 1230 fluid has a No Adverse Effect Limit defined by the NFPA and ISO standards and is approved for use in occupied spaces by the U.S. Environmental Protection Agency (EPA). In its approval of 3M™ Novec™ 1230 Fire Protection Fluid, the EPA noted that the fluid “provides an improvement over use of halon 1301, hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs) in fire protection. .... because it reduces overall risk to public health and the environment...”

The following comparisons outline the relative margin of safety between 3M™ Novec™ 1230 fluid and other clean agents under two common global standards and common fire conditions.

The NFPA 2001 standard recommends the following NOAELs and design concentrations:

| NFPA 2001 Standard<br>Margin of Safety for Occupied Spaces |                      |                                         |                  |
|------------------------------------------------------------|----------------------|-----------------------------------------|------------------|
| Agent                                                      | NOAEL <sup>1</sup>   | Design Concentration (Class A, B and C) | Margin of Safety |
| 3M™ Novec™ 1230 Fire Protection Fluid                      | 10%                  | 4.5-5.9%                                | 69.9% to 122%%   |
| HFC-227ea                                                  | 9%                   | 6.7-8.7%                                | 3% to 24%        |
| Inert Gases                                                | 43% NEL <sup>2</sup> | 34.2-40.6%                              | 6% to 26%        |
| CO <sub>2</sub>                                            | <5% <sup>3,4</sup>   | 34-70%                                  | -85% to -93%     |

1. NFPA No Observable Adverse Effect Level for cardiac sensitization
2. Based on physiological effects in humans in hypoxic atmospheres. These values are the functional equivalents of NOAEL and LOAEL values and correspond to 12 percent minimum oxygen for the no effect level and 10 percent minimum oxygen for the low effect level.
3. CO<sub>2</sub> safety margin data: Carbon Dioxide as a Fire Suppressant: Examining the Risks. <https://www.epa.gov/snap/carbon-dioxide-fire-suppressant-examining-risks>
4. The Minimum Design Concentration (MDC) will vary by fuel type. Per NFPA 12, for Class B, 34% is the MDC.

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

The ISO 14520/EN 15004 standard recommends the following NOELs and design concentrations:

| ISO Standard<br>Margin of Safety for Occupied Spaces<br>Based on ISO 14520/EN 15004 Higher Hazard Class A, and NFPA 12 for CO <sub>2</sub> |       |                                              |       |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------|-------|------------------|
| Agent                                                                                                                                      | NOAEL | Design Concentration (Higher Hazard Class A) |       | Margin of Safety |
| 3M™ Novec™ 1230 Fire Protection Fluid                                                                                                      | 10%   |                                              | 5.6%  | 78.6%            |
| HFC-227ea                                                                                                                                  | 9%    |                                              | 8.5%  | 5.9%             |
| Inert-01                                                                                                                                   | 43%   |                                              | 49.2% | -12.6%           |
| Inert-100                                                                                                                                  | 43%   |                                              | 45.2% | -4.9%            |
| Inert-541                                                                                                                                  | 43%   |                                              | 45.7% | -5.9%            |
| Inert-55                                                                                                                                   | 43%   |                                              | 45.2% | -4.9%            |
| CO <sub>2</sub>                                                                                                                            | <5%   |                                              | 50%   | -90%             |

Learn more about our margin of safety compared to other clean agents in the [Novec 1230 Fluid brochure](#) (PDF, 1.4 mb).

### Q: When designing a fire suppression system using 3M Novec 1230 fluid, how are agent concentrations maintained after discharge?

A: Systems using 3M™ Novec™ 1230 fluid are designed to flood a space with the gas to a design concentration. This design concentration is maintained by ensuring that the space has integrity to maintain the required concentration for the required hold time, usually 10 minutes as a minimum. According to the 2022 edition of NFPA 2001, paragraph 5.6, “A minimum concentration of 85 percent of the adjusted minimum design concentration shall be held at the highest height of protected content within the hazard for a period of 10 minutes or for a time period sufficient to allow for response by trained personnel.” A comparable requirement also exists in ISO 14520:2015 section 7.8.2b.

## Sustainability FAQs

### Q: Why should I choose 3M Novec 1230 fluid rather than an HFC fire suppression system?

A: HFCs like FM-200® (HFC-227ea) and FE-25™ (HFC-125), as well as ECARO-25® (HFC-125), are undergoing global phasedowns in production and consumption.

- In the United States, the American Innovation and Manufacturing (AIM) Act, enacted in 2020, directed the U.S. Environmental Protection Agency to phase down the production and consumption of HFCs by 85% below baseline levels by 2036. This phasedown began with a 15% reduction in Learn more on the EPA’s AIM Act [webpage](#) and [fact sheet](#) (PDF, 179 kb).
- In the European Union, the HFC phasedown started in 2015 under the F-Gas regulation.
- Globally, in 2016 nearly 200 nations approved a timetable for phasing down HFCs under the Kigali Amendment to the Montreal Protocol. This agreement defines the international phasedown paths for HFC production and use. Many countries’ phasedowns began in 2019 or 2020.

Although these HFCs are clean agents that are not known to deplete the ozone layer, they are potent greenhouse gases, with global warming potentials more than 3000 times greater than CO<sub>2</sub>. In contrast, 3M™ Novec™ 1230 fluid has no ozone depletion potential (ODP) and a global warming potential (GWP) of less than one – a more than 99% reduction in global warming potential.

Because fire suppression systems are often intended to last for 30 years or more, FM-200® and other HFCs have an uncertain future under these phasedowns. 3M™ Novec™ 1230 fluid provides the fire protection industry with an agent that will stand the test of time based on its performance and other favorable properties.

[Learn more](#) about how 3M™ Novec 1230™ Fire Protection Fluid stacks up against the competition.

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

5

### **Q: Can 3M guarantee that Novec 1230 fluid will not be subject to environmental restrictions in the future?**

**A:** While no one can accurately predict what the future will bring, 3M offers the 3M™ Blue Sky<sup>SM</sup> Warranty, which helps protect system owners from restrictions on fire protection agents based on their ozone depletion potential or global warming potential. Read the [3M™ Blue Sky<sup>SM</sup> Warranty flyer](#) (PDF, 248 kb) for more information.

In addition, because it is not an HFC, and because it has no ODP and a GWP of less than 1, 3M™ Novec™ 1230 fluid is not targeted by any HFC phasedown nor by any regulation or restriction based on ODP or GWP.

### **Q: What is the 3M™ Blue Sky<sup>SM</sup> Warranty?**

**A:** The 3M™ Blue Sky<sup>SM</sup> Warranty states, for a period of 20 years after original installation and subject to noted requirements, that 3M™ Novec™ 1230 Fire Protection Fluid, installed in an approved fire suppression system, will not be restricted for use in fire protection due to its Ozone Depletion Potential (ODP) or Global Warming Potential (GWP).

Read the [3M™ Blue Sky<sup>SM</sup> Warranty](#) (PDF, 223 kb) complete terms and conditions for more information.

### **Q: How much does this warranty cost?**

**A:** There is no cost for this warranty and it is in effect for 20 years after proper installation by a system provider.

To apply, an end user who purchased a newly installed system must register it on the [3M Novec website](#) within 30 days of system installation. Registration must be renewed every 5 years.

### **Q: Why is 3M™ Novec™ 1230 fluid considered a “third” generation fire suppression clean agent?**

**A:** The halon family of fire protection products was widely utilized as the first generation of clean agents. These products were popular because they could extinguish a fire without damaging the contents of the space being protected, such as early computer server rooms. However, in 1987, halons were regulated by the Montreal Protocol because they contributed to the depletion of the ozone layer. In response to the mandates of the Montreal Protocol, manufacturers developed new products called HFCs, the second generation of clean agents. While none of these products contributed to ozone depletion, they do have other environmental concerns such as high global warming potential (GWP) and are therefore being phased down globally.

3M™ Novec™ 1230 fluid is a third generation clean agent because it was developed to provide high performance and a large margin of safety under the NFPA 2001 and NSO 14520 standards, combined with zero ozone depletion and very low global warming potential.

### **Q: Water is sustainable too. Why would 3M™ Novec™ 1230 fluid be used rather than water?**

**A:** Water sprinkler systems, including water mist systems, use water. Water is wet and messy, electrically conductive and can require costly clean-up. It can destroy the critical assets that keep businesses running. Because water is not a clean agent, it is not covered by NFPA 2001. Instead, it is covered by other standards: NFPA 13 for sprinklers and NFPA 750 for water mist. NFPA 750 notes “The standard does not provide definitive fire performance criteria, nor does it offer specific guidance on how to design a system to control, suppress, or extinguish a fire.” Similarly, water is not covered by the ISO clean agent standard, ISO 14520, and is instead covered by ISO 6182.

FM Global’s Data Sheet 5-32 states: “When it is essential to reduce equipment damage from an incipient fire to minimum possible levels, or to facilitate the return to service, provide an FM Approved clean agent fire extinguishing system with detection to protect the data equipment within the data processing equipment room. This is to supplement the automatic sprinkler or water mist system protecting the facility or raised floor.”

Learn more about [Novec 1230 fluid and water mist](#) (PDF, 234 kb).

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

### Q: Where can I learn more about 3M™ Novec™ 1230 fluid?

**A:** The quickest way to find accurate and informative material regarding 3M™ Novec™ 1230 fluid is on 3M.com.

- **In the United States:** Visit our [fire suppression web page](#).
- **Outside the United States:** Visit your country's 3M fire suppression web page for information tailored to your country.

## Specification and Purchase FAQs

### Q: Can I purchase a fire suppression system using 3M™ Novec™ 1230 fluid from 3M?

**A:** No. 3M manufactures 3M™ Novec™ 1230 fluid but all systems using the fluid are sold and installed through 3M Authorized Original Equipment Manufacturers and their global distribution networks.

### Q: How do I purchase a fire suppression system using 3M™ Novec™ 1230 fluid?

**A:** 3M produces 3M™ Novec™ 1230 fluid and sells it to 3M Authorized Original Equipment Manufacturers (OEMs). 3M Authorized OEMs have third party approvals (such as UL, VdS, LPCB and/or FM Global) for the fire suppression system, including both hardware and software. Systems can be customized to match the needs of the space and the critical item being protected.

OEMs vary by country and system type.

- **In the United States:** [Click here](#) for a full list of 3M Authorized OEMs.
- **Outside the United States:** Visit your country's 3M website for a list of OEMs in your area, or contact 3M in your country for more information.

### Q: How do I specify 3M™ Novec™ 1230 fluid for my fire suppression system?

**A:** When designing a new system, it's important that you specify an agent that's clean, sustainable and reliable. In fire suppression, there are no "equals." To ensure that the system leaves no water or chemical residue behind, specifications should exclude dry chemicals and water mist. To ensure low global warming potential, specifications should exclude HFCs, including FM-200® and ECARO-25®. To ensure quality, reliability and safety, specify 3M™ Novec™ 1230 Fire Protection Fluid by name. Example specifications are [available on 3M.com](#). Or, [learn more](#) about why 3M™ Novec™ 1230 Fire Protection Fluid has no equivalent.

### Q: Is there a requirement to have a dedicated ventilation system to remove 3M™ Novec™ 1230 fluid after a discharge?

**A:** An active mechanical process that is designed to remove 3M™ Novec™ 1230 fluid/gas from the protected space is not required by the U.S. industry standard, NFPA 2001, or the global industry standard, ISO 14520. That said, the designer of a system using 3M™ Novec™ 1230 fluid may consider use of such a ventilation system on a case-by-case basis if conditions warrant, similar to what has been done in the past with halon.

### Q: What is the shelf life of 3M™ Novec™ 1230 fluid?

**A:** Based on accelerated aging using the Van't Hoff method, 3M believes 3M™ Novec™ 1230 fluid will perform its intended function for up to thirty (30) years when used as a component in appropriate, well designed fire protection systems. 3M does not provide a warranty for extended life periods in fire suppression system cylinders since the actual life of the fluid can be significantly influenced by factors outside of 3M's control, including the design of the system, integrity of the cylinders, handling and storage conditions. This confirmation of shelf life does not modify our standard product warranty, which is documented on the Technical Data Sheet for 3M™ Novec™ 1230 fluid available at [3M.com/Novec1230](#). As always, the user must evaluate the product to determine if it is appropriate for a particular application.

### Q: Can I air ship 3M™ Novec™ 1230 fluid in bulk?

**A:** Yes. Unlike other clean agents, 3M™ Novec™ 1230 fluid is stored as a liquid in unpressurized containers and can be shipped in bulk quantities by air.



---

**The 3M™ Novec™ Brand Family** The Novec brand is the hallmark for a variety of proprietary 3M products. Although each has its own unique formula and performance properties, all Novec products are designed in common to address the need for smart, safe and sustainable solutions in industry-specific applications. These include precision and electronics cleaning, heat transfer, fire protection, protective coatings, immersion cooling, advanced insulation media replacement solutions and several specialty chemical applications.

---

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

---

**Safety Data Sheet:** Consult Safety Data Sheet before use.

**Regulatory:** For regulatory information about this product, contact your 3M representative.

**Technical Information:** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

**Product Use:** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

**Warranty, Limited Remedy, and Disclaimer:** Unless a different warranty is specifically stated on the applicable 3M product packaging or product literature, 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY OR CONDITION ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement or repair of the 3M product or refund of the purchase price.

**Electronic Materials Solutions Division**  
3M Center, Building 224-3N-11  
St. Paul, MN 55144-1000 USA

Please recycle. Printed in USA.  
©3M 2022. All rights reserved.  
Issued: 4/22

3M and Novec are trademarks of 3M. Blue Sky is a service mark of 3M. Used under license by 3M subsidiaries and affiliates. FM-200 is a

## 3M™ Novec™ 1230 Fire Protection Fluid (FAQs)

**Phone** 1-800-810-8513

60-5002-0472-6

**Web** [3M.com/Novec1230](http://3M.com/Novec1230)

trademark of The Chemours Company.  
ECARO is a registered mark of Fike  
Corporation. All other trademarks are  
properties of their respective owners.

8

**Limitation of Liability:** Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental, or consequential, regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.

**Disclaimer:** For industrial use only. Not intended, labeled or packaged for consumer sale or use.

