

Safety FAQs

Q: Is this product safe for human occupancy?

A: Yes. 3M Novec 1230 fluid currently provides the largest margin of safety of any clean agent 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...”

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 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 (no leaks or minimal leaks) to maintain the required concentration for the required hold time, usually 10 minutes as a minimum. According to the 2015 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.” This requirement also exists in other, similar standards.

Sustainability FAQs

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

A: As of October 2016, HFCs like Chemours' FM-200® (HFC-227ea) and FE-25™ (HFC-125), as well as Fike's ECARO-25® (HFC-125), are scheduled for global production phasedown under the Montreal Protocol. FM-200® and other hydrofluorocarbons (HFCs) are following the path of halon. Although these HFCs are clean agents that do not deplete the ozone layer, they are potent greenhouse gases—more than 3000 times more potent than CO₂. The European Union's HFC phasedown started in 2015 under the F-Gas regulations and the HFC phasedown in the United States and other developed countries begins in 2019 under the Montreal Protocol.

Because fire suppression systems are often intended to last for 30 years or more, FM-200® and other HFCs have become unsustainable clean agents. Novec 1230 fluid provides the fire protection industry with an agent that will stand the test of time based on its safety, performance and environmental properties. Novec 1230 fluid has no ozone depletion potential and a climate impact less than CO₂ and it's not targeted for phasedown or phase-out.

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

Q: How can I stay up to date on environmental regulations impacting the fire suppression industry?

A: Visit 3M.com/NovecHotTopics to access our insights on the latest developments from around the world. Written by the makers of 3M Novec products to enhance the knowledge and insight of experts like you, this is the place to learn about the forces shaping your business and get the help you need to make informed choices about your fire protection, cleaning or other industrial applications.

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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 is so confident that Novec 1230 fluid will not be affected by any environmental mandates that it offers the 3M™ Blue Sky™ Warranty.

Read the [Blue Sky Warranty flyer](#) (PDF, 248 kb) for more information.

Q: What is the 3M™ Blue Sky™ Warranty?

A: The 3M™ Blue Sky™ 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) and is not targeted for phasedown by the Montreal Protocol, nor subject to the European F-Gas Regulations targeting the phasedown of production and import of HFCs into Europe; and will not be affected by U.S. EPA SNAP regulations which would render it either unacceptable or acceptable subject to narrow use limits.

Read the [3M Blue Sky Warranty](#) (PDF, 223 kb) complete terms and conditions.

Q: How much will it cost to receive this reassurance?

A: There is no cost for this warranty and it is in effect for 20 years after installation.

To apply, an end user who purchased a newly installed system simply registers it on the [3M Novec website](#) within 30 days of system installation.

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 of the new clean agents. These products were popular because they would extinguish a fire without damaging the contents of the space being protected, such as the 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 replacement products for halons known as HFCs including FM-200®, 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 the resulting regulatory consequences addressed above.

Novec 1230 fluid is a third generation clean agent because it was developed to provide high performance and a large margin of safety without harming the environment.

Q: Water is sustainable too. Why would Novec 1230 fluid be used rather than water mist?

A: Water mist is still water. It is wet and messy, electrically conductive and can require costly clean-up. It can destroy the critical assets that keep businesses running. Because water mist is not a clean agent, it is not covered by NFPA 2001. Instead, it is covered by another standard: NFPA 750 which 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.”

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.”

Q: Where can I learn more about Novec 1230 fluid?

A: The quickest way to find accurate and informative material regarding Novec 1230 fluid is on our [Fire Suppression - Novec 1230 Fluid webpage](#).

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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

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 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.

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Electronics Materials Solutions Division
3M Center, Building 224-3N-11
St. Paul, MN 55144-1000 USA
Phone 1-800-810-8513
Web www.3M.com

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Exhibit E
Technical Information – Oil Coolant

**Envirotemp[™]
FR3[™] fluid
Formulated
for performance.**



Envirotemp™ FR3™ fluid.
Trusted worldwide
a million times over.





With over one million installations across six continents and validated in over 250 tests, Cargill's Envirotmp™ FR3™ natural ester fluid is trusted by our customers to deliver cost-effective solutions that help improve transformer performance reliably and safely.

Our team of dielectric experts is active in the standards community globally and has extensive knowledge of not only dielectric fluid properties but also fluid performance in

application. And they have transformer design experience, too. This means our customers adopting FR3 natural ester technology have comprehensive dielectric fluids support from initial planning stages through best practices implementation and beyond.

Backed by Cargill's global supply chain network, our customers can rely on us to deliver the best solution for their application - when they need it, anywhere in the world.

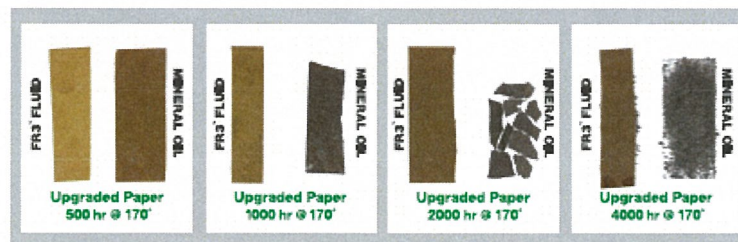
With FR3 fluid, our customers can:

- Gain cost efficiencies either on initial cost or total cost of ownership without sacrificing reliability.
- Extend transformer insulation and asset life.
- Optimize load capacity.
- Significantly improve fire safety.
- Enhance their environmental footprint and sustainable supply chain initiatives.

Improve performance with life extension and loading flexibility.

Protect insulation life to extend asset life.

Insulation paper is one of the primary factors that determines the life of a transformer. FR3™ fluid's unique chemistry absorbs free water and essentially wicks it away from the insulation paper. FR3 fluid has 10 times the water saturation level of mineral oil. This results in extending the insulation life 5-8 times longer than mineral oil.



Insulation aging study comparing thermally upgraded paper using FR3 fluid vs. mineral oil.

- Save significantly on replacement costs by extending the asset life with FR3 fluid.
- Reduce the risk of failure to improve reliability of the transformer.
- Reduce processing maintenance costs, since FR3 fluid does not sludge like mineral oil.