

3M™ Novec™ 1230 Fire Protection Fluid
For Oil and Gas Applications



Keeping
Your
Profits
Flowing



Advanced fire protection

for your most valuable assets

3M™ Novec™ 1230 Fire Protection Fluid is an advanced, “next generation” clean agent halon and CO₂ replacement, suitable for use in a wide range of offshore and land-based oil and gas operations to protect occupied spaces and critical equipment.

Based on a patented chemistry from 3M, Novec 1230 fluid offers a number of important advantages over conventional clean agents such as HFCs and CO₂. Its low acute toxicity, combined with high extinguishing efficiency, gives Novec 1230 fluid the widest margin of safety among all other chemical clean agents and CO₂ – even at relatively high extinguishing concentrations. This makes Novec 1230 fluid ideal for occupied spaces, where personnel may be exposed to the agent upon system discharge.

3M™ Novec™ 1230 Fire Protection Fluid

The right choice for offshore, marine and land-based special hazards fire protection

- Zero Ozone Depletion Potential
- Global Warming Potential of 1
- Large margin of safety vs. other chemical extinguishing agents and CO₂
- Fast extinguishment
- Saves space and weight
- No restrictions on shipping by air, sea or truck
- Local refill possible



Created for life

Perhaps most important, 3M™ Novec™ 1230 Fire Protection Fluid helps address the global demand for a halon replacement that has 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, making it exempt from restrictions on greenhouse gases. It is the first halocarbon halon replacement to offer a viable, long-term sustainable technology for special hazards fire protection in the oil and gas industry.

Fast, effective fire protection for electronics, navigation systems and other valuable assets

In addition to its favorable safety and environmental profiles, 3M™ Novec™ 1230 Fire Protection Fluid is a highly-effective fire extinguishant, designed to knock down fires quickly, before they have a chance to disrupt production or spread to Class B hazards, such as gasoline, oil and oil-based paints. This unique combination of properties has caused Novec 1230 fluid to gain increased acceptance in offshore drilling, production, storage and transportation vessels – both for new builds and refurbishments. It is an ideal choice for many “special hazards” applications where personal safety and maintaining continuity of operations are of vital concern, including:

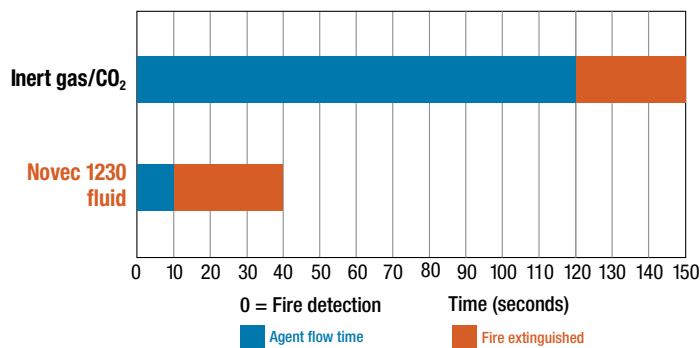
- Engine rooms
- Generator rooms
- SCR – electrical control rooms
- Inventory rooms
- Paint rooms
- Gas compressor rooms
- Propulsion systems & thrusters in pontoons
- Pilot houses
- All diving systems rooms
- Pump rooms
- Workshops and storage areas



Novec 1230 fluid is non-corrosive, electrically non-conductive and evaporates rapidly, so it will not damage high value assets such as delicate electronics, controls and navigational equipment. It vaporizes greater than fifty times faster than water. And unlike competitive foams and powders it does not leave messy residues to clean up, allowing systems to remain operational.



Engineered for fast extinguishment



Novec 1230 fluid knocks down fires in less than half the time of CO₂ agents. Fast extinguishment helps keep fires small, giving them less chance to spread.

Simplified storage and handling

Because it is a liquid at room temperature, and stored at low vapor pressure, agent handling and charging of systems using 3M™ Novec™ 1230 Fire Protection Fluid fluid is greatly simplified, and can be accomplished without moving the cylinders offsite. This can be an especially important consideration for servicing offshore facilities – saving you time, and ensuring uninterrupted protection of your assets. The liquid state of Novec 1230 fluid also allows for efficient use of space, requiring about the same number of cylinders as conventional halocarbon agents. The product can be shipped safely by air in bulk quantities, without restrictions.

Engineered to save space



Halon
1301



**Novec
1230**



CO₂



Inert Gas

Containers needed for typical Class B system



An environmentally-sustainable technology...

3M™ Novec™ 1230 Fire Protection Fluid Environmental Properties

Properties	Novec 1230	HFC-125	HFC-227ea	HFC-23
Ozone Depletion Potential (ODP) ¹	0.0	0.0	0.0	0.0
Global Warming Potential–IPCC ²	1	3500	3220	14800
Atmospheric Lifetime (Years)	0.014 (5 days)	29	34.2	270

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

² Intergovernmental Panel on Climate Change (IPCC) 2007 Method, 100 Year 1TH, CO₂ = 1.

...with a margin of human safety surpassing all chemical agents, CO₂ & inert gas mixtures

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

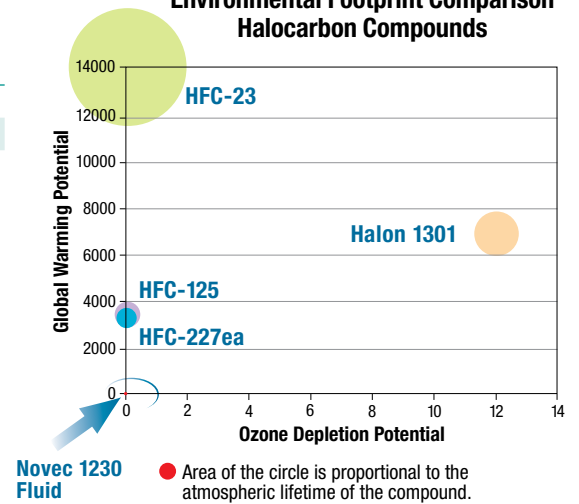
Agent	Novec 1230	HFC-125	HFC-227ea	Inert Gas	CO ₂
Use Concentration ¹	4.2-5.9%	8.7-12.1%	6.25-8.7%	34.2-40.6%	30-75%
NOAEL ²	10%	7.5%	9%	43%	<5%
Safety Margin	69-138%	nil	3-44%	6-26%	Lethal at design concentration

¹ 2008 NFPA 2001 and NFPA 12

² NOAEL for cardiac sensitization (halocarbons) and effects specific to CO₂



Environmental Footprint Comparison Halocarbon Compounds



Novec 1230 fluid is an ideal choice for many “special hazards” applications where personal safety and maintaining continuity of operations are essential.

Globally approved



Fire suppression systems using 3M™ Novec™ 1230 Fire Protection Fluid have been submitted by their manufacturers for certification by marine approval authorities around the world:

- UK MCA
- RINA, Italy
- LRS Type Approval
- DNV Type Approval
- Bureau Veritas Type Approval
- UK Module B
- Polish Registry of Shipping
- Australian Coast Guard
- Marine Marchand Approval
- Dutch Shipping Authority Acceptance, Inland & Sea
- Belgium–Inland and Sea going Acceptance
- Icelandic Registry of Shipping
- American Bureau of Shipping (International)
- Canadian Coast Guard
- Korean Registry of Shipping
- Germanische Lloyds
- U.S. Coast Guard

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
- China
- ✓ **Approved globally for total flooding without restriction**
- ✓ **Not restricted by Kyoto Protocol or any other environmental legislation**

3M™ Blue Sky™ 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™ 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

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 1990s, when they became restricted, and are now banned from being manufactured and are being phased out in end use.

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™ 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.

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

United States	China	Europe	Japan	Korea	Singapore	Taiwan
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Electronics Markets Materials Division

3M Center, Building 224-3N-11
St. Paul, MN 55144-1000
www.3M.com/novec
1-800-810-8513

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