Today’s world is full of changes designed to help protect the environment, but managing the risks created by these changes is a major challenge. Fortunately, 3M understands your challenges and has the answer you’re looking for with the 3M™ Blue Sky™ Warranty.

The high global warming potential and atmospheric persistence of fluorinated gases is leading environmentalists and regulatory agencies to look for alternatives to fluorinated gases used in fire suppression systems. 3M’s investments in engineering and manufacturing have led to a new line of environmentally preferable fire suppression fluids.

3M’s Novec™ Engineered Fluids are being used as a non-flammable, non-toxic alternative to halon for air cleaning and process cooling in many industries. 3M Engineered Fluids are being used as a non-flammable, non-toxic alternative to halon in a wide variety of applications. For more information on one of these exclusive products, visit www.3M.com/3MEngineeredFluids.

Novec products are designed to address the need for advanced, effective, sustainable solutions in industry-specific applications. These include electronics cooling, heat transfer, fire protection, lubricant deposition and several specialty chemical applications.

For Museums and Archives

Novec products are being used as a non-flammable, non-toxic alternative to halon for storing and preserving fragile museum wet specimens. For more information on these applications, visit www.3M.com/3MNovec.

For complete details on this program, please contact your 3M representative, or visit www.3M.com/novec1230fluid.
3M™ 1230 Fire Protection Fluid is an advanced "clean agent" for suppression material, used to protect high-value assets such as rare books, documents, archives, artwork, exhibits, display cases, records, computers and other valuable electronics. 3M™ Novec 1230 Fluid is designed to allow owners or users to have confidence in their system, with extinguishing properties that come with a large margin of safety for both the environment and for personnel inside the protected room.

### Environmental properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Novec 1230™</th>
<th>Novec 1230™</th>
<th>Novec 1230™</th>
<th>Novec 1230™</th>
<th>Novec 1230™</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone Depletion Potential</td>
<td>0.0</td>
<td>4.0</td>
<td>12.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Global Warming Potential</td>
<td>1</td>
<td>1890</td>
<td>7140</td>
<td>3500</td>
<td>3220</td>
</tr>
<tr>
<td>Atmospheric Lifetime</td>
<td>5 – 20</td>
<td>5 – 20</td>
<td>5 – 20</td>
<td>5 – 20</td>
<td>5 – 20</td>
</tr>
<tr>
<td>Margin of Safety</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

This makes Novec 1230 Fluid an ideal solution for vault storage fire protection.

Secure vaults, constructed from concrete and other fire-resistant materials, are often used for long-term storage of documents, artwork and other valuable items that must not be damaged by a fire extinguishing agent.

As a clean agent, Novec 1230 Fluid offers a number of important characteristics for protecting high-value assets. By definition, clean agents do not leave a residue when they discharge, and typically can be easily cleaned, so they won’t damage delicate objects or affect the operation of sensitive electronics.

Water sprinklers and water mist systems are effective for extinguishing structural fires, but water can be as destructive to fragile, irreplaceable artifacts as fire itself. Dry chemical extinguishing systems avoid these problems, but leave powdery residues that are difficult to clean up, and can damage or destroy delicate objects. As a clean agent, Novec 1230 Fluid offers the largest margin of safety of any chemical halon replacement available on the market today.

### Fire protection for green buildings

Novec 1230 Fluid’s unique properties make it a particularly suitable choice for green buildings, where fire safety systems must meet stringent performance standards and requirements while minimizing impact on the environment.

Because of its low environmental impact, Novec 1230 Fluid is backed by industry-leading environmental safety data.

For more information about 3M™ Novec 1230 Fire Protection Fluid, including how it can help you achieve LEED certification, visit www.3M.com/novec1230fluid.
Today’s sustainable clean agent solution

3M™ Novec™ 1230 Fire Protection Fluid is an advanced “clean agent” for suppression systems, used to protect high-value assets such as works of art, documents, archives, rare manuscripts, display cases, records, computers and other delicate electronics. Novec 1230 fluid is designed to alleviate concerns for human safety, asset preservation, extinguishing agent performance, and system lifetime. For use in clean agent fire protection – with key properties that have re-defined “sustainability” – in clean agent protectors:

• Zero ozone depletion potential
• Fast for engineered facilities
• Global warming potential of one
• Free from hazardous residues

As a clean agent, Novec 1230 Fluid offers a number of important advantages for protecting high-value assets. By definition, clean agents do not leave a residue that wet systems leave behind, and typically can be electrically non-conductive, so they won’t endanger delicate objects or affect the operation of sensitive electronics.

Water sprinklers and water mist systems are effective for extinguishing structural fires, but water can be disastrous for highly valuable assets such as the library or museum artifacts. Clean extinguishing systems avoid these problems, but because precious contents could be difficult to clean up, and can damage or destroy delicate equipment, hard films and electronic assets.

3M Novec 1230 fluid, on the other hand, poses none of these drawbacks. It provides fast, clean extinguishing concentrations. Should a staff member or visitor become disoriented or trapped in the close confines of a vault during an agent discharge, the result could be lethal.

Extinguishing via its cooling effect, Novec 1230 fluid works as a gas, yet it is a liquid at room temperature. It is a highly efficient fire extinguishant that can be used for flooding applications in engineered and pre-engineered systems. It is ideal for environments such as libraries, cultural heritage, galleries, storage rooms, archives, and museums, where valuable forms may not be damaged by a fire or fire-fighting agent.

Because it is not packaged under pressure, Novec 1230 fluid uses unique operating and handling advantages over high-pressure agents. Systems using Novec 1230 fluid offer a much wider margin of safety compared to gas-based systems.

Novec 1230 fluid is a fluoroketone – a proprietary 3M technology that has some unique properties described as: extremely low global warming potential and short atmospheric lifetime. 3M™ Novec™ 1230 Fire Protection Fluid is the first clean agent replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

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Environmental Properties

With zero ozone depletion potential, extremely low global warming potential and short atmospheric lifetime. 3M™ Novec™ 1230 Fire Protection Fluid is the first clean agent replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

<table>
<thead>
<tr>
<th>Environmental Property</th>
<th>Fluoroketone</th>
<th>1211</th>
<th>1301</th>
<th>HFC-125</th>
<th>HFC-227ea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Warming Potential</td>
<td>1</td>
<td>1890</td>
<td>7140</td>
<td>3500</td>
<td>3220</td>
</tr>
<tr>
<td>Atmospheric Lifetime (Years)</td>
<td>0.014</td>
<td>16</td>
<td>65</td>
<td>34.2</td>
<td>29</td>
</tr>
<tr>
<td>Ozone Depletion Potential</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ozone Sensitivity</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Fire protection for green buildings

With zero ozone depletion potential, extremely low global warming potential and short atmospheric lifetime. 3M™ Novec™ 1230 Fire Protection Fluid is the first clean agent replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

Five-day atmospheric lifetime

3M™ Novec™ 1230 Fire Protection Fluid is an advanced clean agent that offers a new level of sustainability in clean agent fire protection.

An ideal solution for vault storage fire protection

Secure vaults, constructed from concrete and other fire-resistant materials, are often used for long-term storage of documents, archives and electronic data. These structures pose unusual challenges in fire protection engineering.

Prior to 2003, the only solution of the type allowed was NFPA 232 for vault interiors was either water or inert gases such as carbon dioxide (CO2). And CO2 can have serious disadvantages, including a high toxicity potential, a tendency toward overpressurization of the tightly-sealed vaults, and, because many of these vaults are normally occupied, agent toxicity is another concern. For example, CO2 is toxic at concentrations of 10% or more, and the U.S. National Research Council recommends it should be kept below 5%.

Novec 1230 fluid is a fluoroketone – a proprietary 3M technology that has some unique properties described as: extremely low global warming potential and short atmospheric lifetime. 3M™ Novec™ 1230 Fire Protection Fluid is the first clean agent replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

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3M® Novec 1230 Fire Protection Fluid

Today’s sustainable clean agent solution

3M® Novec 1230 Fire Protection Fluid is an advanced “clean agent” for suppression material, used to protect high-value assets such as rare books, documents, artworks, rare artifacts, display cases, records, computers and other delicate electronics. 3M® Novec 1230 Fluid is designed to alleviate concerns for human safety, asset preservation, extinguishing performance and the environment – key properties that have led to “sustainability” in clean agent protection.

- Zero ozone depletion potential
- A global warming potential of one
- Free for sequestration

As a clean agent, Novec 1230 Fluid offers a number of important advantages for protecting high-value assets. By definition, clean agents never leave a residue, because they discharge, and typically can be electrically non-conductive, so they won’t damage delicate objects or affect the operation of sensitive electronics. Water sprinklers and water mist systems are effective for extinguishing structural fires, but water can be an destroy irreplaceable artifacts, documents and digital media.

Novec 1230 fluid offers the largest margin of safety of any chemical halon replacement available on the market today. 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. 

A global warming potential of one

- Zero ozone depletion potential

Novec 1230 fluid is a highly efficient fire extinguishant that can be used for flooding applications as well as for engineered systems. It is ideal for environments such as libraries, cultural heritage, art galleries, storage rooms, archives and museums, where valuable items must not be damaged by a fire extinguishing agent.

An ideal solution for vault storage fire protection

3M® Novec 1230 Fire Protection Fluid is the first chemical halon replacement to offer a zero ozone depletion potential, extremely low global warming potential and short atmospheric lifetime. 3M® Novec 1230 Fluid is the first chemical halon replacement to offer a viable, long-term, sustainable technology for special hazards fire protection.

Environmental properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Novec 1230</th>
<th>Halon 1211</th>
<th>Halon 1301</th>
<th>HFC-125</th>
<th>HFC-227ea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone Depletion Potential 1</td>
<td>0.0</td>
<td>4.0</td>
<td>12.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Atmospheric Lifetime (Years)</td>
<td>0.014</td>
<td>16</td>
<td>65</td>
<td>34.2</td>
<td>29</td>
</tr>
<tr>
<td>Global Warming Potential 2</td>
<td>1</td>
<td>1890</td>
<td>7140</td>
<td>3500</td>
<td>3220</td>
</tr>
<tr>
<td>SNAP: approved for flooding</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Regulatory Status</td>
<td>USA TSCA: product complies with chemical notification requirements</td>
<td>Canada: product complies with chemical notification requirements</td>
<td>China: product complies with chemical notification requirements</td>
<td>Australia: product complies with chemical notification requirements</td>
<td>Indonesia: product complies with chemical notification requirements</td>
</tr>
</tbody>
</table>

Aerosols, a class of chemical clean agents introduced in the 1930s, were found to be fire extinguishers, but were eventually abandoned because of their high ozone depletion potential. First generation halon replacements, such as HFC-125, are not ozone depleting. However, they pose greater concerns about the long-term sustainability of HFCs because of their high global warming potential and long atmospheric residence. 

Clean agents, which are electrically non-conductive and free of sequestration, are now allowable under the standard. However, certain clean agents – such as inert gases – are impractical in this application, because of concerns about ozone depletion of the highly valued agents. And, because many of these halons are not currently occupied, agent toxicity is another concern. For example, CO₂ is toxic at 100 ppm. A new agent, Novec 1230 Fluid, designed to alleviate concerns for human safety, asset preservation, extinguishing performance and the environment – key properties that have led to “sustainability” in clean agent protection.

Novec 1230 fluid is a highly efficient fire extinguishant that can be used for flooding applications as well as for engineered systems. It is ideal for environments such as libraries, cultural heritage, art galleries, storage rooms, archives and museums, where valuable items must not be damaged by a fire extinguishing agent.

An ideal solution for vault storage fire protection

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For more information about 3M Novec 1230 Fire Protection Fluid, including how it can help you meet LEED requirements, please visit www.3M.com/novec1230fluid.

Created for life

3M™ Novec 1230 Fire Protection Fluid is a trademark — a proprietary 3M technology that offers a number of important advantages over conventional halon replacements. Extinguishing via a cooling effect, Novec 1230 fluid acts as a gush, jet or plume at room temperature. It is a highly efficient fire extinguisher that can be used for flooding applications as well as for engineered systems. It is ideal for environments such as libraries, cultural heritage, art galleries, storage rooms, archives and museums, where valuable items must not be damaged by a fire extinguishing agent.

Because it is not packaged under pressure, Novec 1230 Fluid is non-irritating and non-irritating, having no high pressure safety valves. Systems using Novec 1230 Fluid allow for more efficient use of space compared to gas-based systems.
Today's world is full of changes designed to help protect the environment. But managing the risks created by these changes is a challenge. Fortunately, 3M understands your challenges and has the answer you're looking for with the 3M™ Blue Sky™ Warranty.

The high global warming potential and action to protect the environment raises questions about whether their use will continue to be permitted. For example, CFCs have been completely banned in the United States and its territories. This new use will significantly impact the environment and the regulatory requirements are being phased out in a controlled manner. It is estimated that there is a 100,000+ tonne potential reduction in global warming potential by 2010.

The California Blue Sky Board (CBEA) proposed regulations that recognize the concern that, while emissions from this sector may be considered low due to its relatively small contribution to total emissions, they are likely to increase in the future as a result of economic development and trends in energy use. These regulations recognize the importance of reducing the use of CFCs.

These issues are particularly important to the museum and the archivist. If restrictions were introduced in the future, an HFC-based fire suppression system would either have to be replaced in its entirety, or substantially modified resulting in considerable expense.

The Novec™ Novec™ 1230 Fire Protection 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.

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

3M™ Novec™ 1230 Fire Protection Fluid

Resources

The high global warming potential and action to protect the environment raise questions about whether their use will continue to be permitted. Fortunately, 3M understands your challenges and has the answer you're looking for with the 3M™ Blue Sky™ Warranty.

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These issues are particularly important to the archivist. If restrictions were introduced in the future, an HFC-based fire suppression system would either have to be replaced in its entirety, or substantially modified resulting in considerable expense. That is why 3M offers you the peace of mind made possible by our 3M™ Blue Sky™ Warranty.

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

Today’s world is full of change designed to help ensure a better tomorrow. But managing the risks created by these changes is a challenge.
For many, 3M® offers the tools to help you face these challenges and find the answers you’re looking for with the “3M® Blue Sky®” Warranty.

This high global warming potential and potential to introduce chemicals into the atmosphere. In 2015, the European Union (EU) ruled that PFCs are highly "suspected of causing harm to human health or the environment" and are being phased out in the USA.

3M® Novec™ 1230 Fire Protection 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.

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 fire suppression, precision and electronics cleaning, heat transfer, fire protection, lubricant deposition and several specialty chemical applications.

3M™ Novec™ 1230 Fire Protection Fluid

In addition to 3M® Novec™ 1230 Fire Protection Fluid, the 3M® Novec™ brand family of products can provide you with safe, effective, sustainable solutions to industry-specific applications. For example, 3M® Novec™ Engineered Fluids are being used as a non-flammable, non-toxic alternative to halon for charging and preserving fragile museum and archive objects. For more information on other 3M® brand product families, visit www.3M.com.

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The 3M™ Blue Sky® Warranty.

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