1. IDENTIFICATION

Product Name
3M™ Novec™ 1230
(Fire Extinguishing Agent, Pressurized and Non-pressurized)

Recommended use of the chemical and restrictions on use

Identified uses
Fire Extinguishing Agent

Restrictions on use
Consult applicable fire protection codes

Company Identification
Kidde-Fenwal, Inc.
400 Main Street
Ashland, MA 01721
USA

Customer Information Number
(508) 881-2000

Emergency Telephone Number
CHEMTREC Number
(800) 424-9300
(703) 527-3887 (International)

Issue Date
April 10, 2015

Supersedes Date
February 9, 2012

Safety Data Sheet prepared in accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200) and the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

2. HAZARD IDENTIFICATION

This SDS covers the product listed above as sold in pressurized and non-pressurized containers. GHS classifications for both forms are listed below.

GHS Classification – Pressurized

Hazard Classification
Chronic hazard to the aquatic environment - Category 3 (This classification not adopted by OSHA)
Gas under pressure – Compressed gas

Label Elements
Hazard Symbols

Signal Word: Warning
2. HAZARD IDENTIFICATION

Hazard Statements
Harmful to aquatic life with long lasting effects.
Contents under pressure; may explode if heated.

Precautionary Statements
Prevention
Avoid release to the environment.
Response
None
Storage
Protect from sunlight.
Store in well-ventilated place.
Disposal
Dispose of contents/container in accordance with local regulation.

GHS Classification: Non - pressurized

Hazard Classification
Chronic hazard to the aquatic environment - Category 3 (This classification not adopted by OSHA)

Label Elements
Hazard Symbols
None

Signal Word: None

Hazard Statements
Harmful to aquatic life with long lasting effects.

Precautionary Statements
Prevention
Avoid release to the environment.
Response
None
Storage
None
Disposal
Dispose of contents/container in accordance with local regulation.

Other Hazards
None identified.

Specific Concentration Limits
The values listed below represent the percentages of ingredients of unknown toxicity.
Acute oral toxicity 0%
Acute dermal toxicity 0%
Acute inhalation toxicity 0%
Acute aquatic toxicity 0%
3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a substance.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,2,2,4,5,5,5,-Nonafluoro-4-(trifluoromethyl)-3-pentanone</td>
<td>756-13-8</td>
<td>&gt;99.9%</td>
</tr>
</tbody>
</table>

Note: Pressurized product uses nitrogen as the expellant.

4. FIRST-AID MEASURES

Description of necessary first-aid measures

Eyes
Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Skin
Wash skin thoroughly with soap and water. Obtain medical attention if irritation persists.

Ingestion
Rinse mouth. Obtain medical attention if you feel unwell.

Inhalation
Move victim to fresh air. Obtain medical attention immediately for any breathing difficulty.

Most important symptoms/effects, acute and delayed

Aside from the information found under Description of necessary first aid measures (above) and Indication of immediate medical attention and special treatment needed, no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Notes to Physicians
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
This preparation is used as an extinguishing agent and therefore is not a problem when trying to control a blaze. Use extinguishing agent appropriate to other materials involved. Keep pressurized containers and surroundings cool with water spray as they may rupture or burst in the heat of a fire.

Specific hazards arising from the chemical
Predominant decomposition product is hydrogen fluoride in fire situations. By-products are irritating and potentially toxic. Pressurized containers may explode in heat of fire.

Special Protective Actions for Fire-Fighters
Wear full protective clothing and self-contained breathing apparatus as appropriate for specific fire conditions.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Wear appropriate protective clothing. Prevent skin and eye contact. Remove leaking container to a safe place. Ventilate the area.

Environmental Precautions
Prevent large quantities of the material from entering drains or watercourses.

Methods and materials for containment and cleaning up
Contain and absorb using earth, sand or other inert material. Transfer into suitable containers for recovery or disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Wear appropriate protective clothing.

Conditions for safe storage
Pressurized containers should be properly stored and secured to prevent falling or being knocked over. Do not drag, slide or roll pressurized containers. Do not drop pressurized containers or permit them to strike against each other. Never apply flame or localized heat directly to any part of the pressurized or plastic container. Store pressurized and plastic containers away from high heat sources. Storage area should be: - cool - dry - well ventilated - under cover - out of direct sunlight

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

3M™ Novec™ 1230
Manufacturer’s recommended exposure limit: 150 ppm, 8 hr TWA

Appropriate engineering controls
Engineering methods to prevent or control exposure are preferred. Methods include process or personnel enclosure, mechanical ventilation (dilution and local exhaust), and control of process conditions.

Individual protection measures
Respiratory Protection
Wear respiratory protection if there is a risk of exposure to high vapor concentrations, aerosols or if material is exposed to extreme overheating. The specific respirator selected must be based on the airborne concentration found in the workplace and must not exceed the working limits of the respirator.

Skin Protection
Gloves

Eye/face Protection
Chemical goggles or safety glasses with side shields.

Body Protection
Normal work wear.
9. PHYSICAL AND CHEMICAL PROPERTIES

### Non-Pressurized

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.6</td>
</tr>
<tr>
<td>Boiling Range/Point (°C/F)</td>
<td>49.2 °C/120.6 °F</td>
</tr>
<tr>
<td>Melting Point (°C/F)</td>
<td>-108 °C/-162.4 °F</td>
</tr>
<tr>
<td>Flash Point (PMCC) (°C/F)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.404 bar (5.87 psig) @ 25 °C</td>
</tr>
<tr>
<td>Evaporation Rate (BuAc=1)</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Nil</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>11.6</td>
</tr>
<tr>
<td>VOC (g/l)</td>
<td>1600 g/l</td>
</tr>
<tr>
<td>VOC (%)</td>
<td>100%</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>0.6 centipoise @ 25 °C</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosive limit</td>
<td>None detected</td>
</tr>
<tr>
<td>Lower explosive limit</td>
<td>None detected</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

### Expellant - Nitrogen

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Compressed gas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>None</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>No data available</td>
</tr>
<tr>
<td>Gas Density</td>
<td>0.075 lb/ft³ @70°F as vapor</td>
</tr>
<tr>
<td>Boiling Range/Point (°C/F)</td>
<td>-196°C/-321 °F</td>
</tr>
<tr>
<td>Melting Point (°C/F)</td>
<td>-210°C/-346 °F</td>
</tr>
<tr>
<td>Flash Point (PMCC) (°C/F)</td>
<td>Not flammable</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation Rate (BuAc=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>0.2 g/l</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>0.97</td>
</tr>
<tr>
<td>VOC (g/l)</td>
<td>None</td>
</tr>
<tr>
<td>VOC (%)</td>
<td>None</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Auto-ignition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper explosive limit</td>
<td>Not explosive</td>
</tr>
</tbody>
</table>
9. PHYSICAL AND CHEMICAL PROPERTIES

Lower explosive limit  Not explosive
Flammability (solid, gas)  Not flammable

10. STABILITY AND REACTIVITY

Reactivity
Pressurized containers may rupture or explode if exposed to heat.

Chemical Stability
Stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization will not occur.

Conditions to Avoid
Exposure to direct sunlight - ultraviolet light - contact with incompatible materials

Incompatible Materials
Strong bases - amines - alcohols - water

Hazardous Decomposition Products
Oxides of carbon - hydrogen fluoride - perfluoroisobutylene

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
3M™ Novec™ 1230
Oral LD50 (rat) >2000 mg/kg
Dermal LD50 (rat) >2000mg/kg
Inhalation LC50 (rat) >1227 mg/l 4hr
Nitrogen
Simple asphyxiant

Specific Target Organ Toxicity (STOT) – single exposure
3M™ Novec™ 1230: All data were negative in a 2 hour rat inhalation study (nervous system). The NOAEL was determined to be 10,000ppm. All data were negative in a 17 minute dog inhalation study (cardiac sensitization).
Nitrogen: Exposure to nitrogen gas at high concentrations can cause suffocation by reducing oxygen available for breathing. Breathing very high concentrations can cause dizziness, shortness of breath, unconsciousness or asphyxiation.

Specific Target Organ Toxicity (STOT) – repeat exposure
3M™ Novec™ 1230: NOAEL from 90-day inhalation study was determined to be 3000ppm. Results indicate 3M™ Novec™ 1230 is not expected to cause target organ effects after repeat exposure.

Serious Eye damage/Irritation
3M™ Novec™ 1230: No significant irritation to skin in rabbit study.

Skin Corrosion/Irritation
3M™ Novec™ 1230: No significant irritation to skin in rabbit study.
11. TOXICOLOGICAL INFORMATION

Respiratory or Skin Sensitization
3M™ Novec™ 1230: Did not cause skin sensitization in guinea pig study.

Carcinogenicity
Not considered carcinogenic by NTP, IARC, and OSHA.

Germ Cell Mutagenicity
3M™ Novec™ 1230: Not mutagenic in both in vivo and in vitro testing.

Reproductive Toxicity
3M™ Novec™ 1230: Not toxic to male reproduction, female reproduction or development in rat inhalation study. The NOAEL was determined to be 3000ppm.

Aspiration Hazard
Not an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicity
3M™ Novec™ 1230
LC50 Zebra fish >1200mg/l 96h
EC50 Daphnia magna >1200mg/l 48h
EC50 Green algae 7.7mg/l 72h
Classified by ECHA as Aquatic Chronic 3: Harmful to aquatic life with long lasting effects.

Mobility in soil
3M™ Novec™ 1230: Product is highly insoluble in water and volatile.

Persistence/Degradability
3M™ Novec™ 1230: Photolytic half-life: 3 - 5 days. Persistent Photolytic degradation product: trifluoroacetic acid.

Bioaccumulative Potential
No relevant studies identified.

Other adverse effects
No relevant studies identified.

13. DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose of container in accordance with all applicable local and national regulations.
SAFETY DATA SHEET
3M™ Novec™ 1230
(Fire Extinguishing Agent, Pressurized and Non-pressurized)

14. TRANSPORT INFORMATION

Safety Data Sheet information is intended to address a specific material and not various forms or states of containment.

**Pressurized Containers**

<table>
<thead>
<tr>
<th>DOT CFR 172.101 Data</th>
<th>Fire extinguishers, 2.2, UN1044</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Proper Shipping Name</td>
<td>Fire extinguishers</td>
</tr>
<tr>
<td>UN Class</td>
<td>(2.2)</td>
</tr>
<tr>
<td>UN Number</td>
<td>UN1044</td>
</tr>
<tr>
<td>UN Packaging Group</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Classification for AIR</td>
<td>Consult current IATA Regulations prior to shipping by air.</td>
</tr>
<tr>
<td>Transportation (IATA)</td>
<td>Classification for Water</td>
</tr>
<tr>
<td>Classification for Water</td>
<td>Consult current IMDG Regulations prior to shipping by water.</td>
</tr>
<tr>
<td>Transport IMDG</td>
<td></td>
</tr>
</tbody>
</table>

**Non-pressurized Containers**

<table>
<thead>
<tr>
<th>DOT CFR 172.101 Data</th>
<th>Not Regulated</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN Proper Shipping Name</td>
<td>Not Regulated</td>
</tr>
<tr>
<td>UN Class</td>
<td>None.</td>
</tr>
<tr>
<td>UN Number</td>
<td>None.</td>
</tr>
<tr>
<td>UN Packaging Group</td>
<td>None.</td>
</tr>
<tr>
<td>Classification for AIR</td>
<td>Consult current IATA Regulations prior to shipping by air.</td>
</tr>
<tr>
<td>Transportation (IATA)</td>
<td>Classification for Water</td>
</tr>
<tr>
<td>Classification for Water</td>
<td>Consult current IMDG Regulations prior to shipping by water.</td>
</tr>
<tr>
<td>Transport IMDG</td>
<td></td>
</tr>
</tbody>
</table>

This section is believed to be accurate at the time of preparation. It is not intended to be a complete statement or summary of the applicable laws, rules, or hazardous material regulations, and is subject to change. Users have the responsibility to confirm compliance with all laws, rules, and hazardous material regulations in effect at the time of shipping.

15. REGULATORY INFORMATION

**United States TSCA Inventory**
This product contains ingredients that are listed on or exempt from listing on the EPA Toxic Substance Control Act Chemical Substance Inventory.

**Canada DSL Inventory**
All ingredients in this product are listed on the Domestic Substance List (DSL) or the Non-Domestic Substance List (NDSL) or are exempt from listing.

**SARA Title III Sect. 311/312 Categorization: Pressurized**
Pressure hazard

**SARA Title III Sect. 311/312 Categorization: Non-pressurized**
None

**SARA Title III Sect. 313**
This product does not contain any chemicals that are listed in Section 313 at or above de minimis concentrations.
16. OTHER INFORMATION

   NFPA Ratings
   NFPA Code for Health - 3
   NFPA Code for Flammability - 0
   NFPA Code for Reactivity - 1
   NFPA Code for Special Hazards - None

   HMIS Ratings
   HMIS Code for Health - 1
   HMIS Code for Flammability - 0
   HMIS Code for Physical Hazard - 1
   HMIS Code for Personal Protection - See Section 8
   *Chronic

   Legend
   ACGIH: American Conference of Governmental Industrial Hygienists
   CAS#: Chemical Abstracts Service Number
   ECHA: European Chemicals Agency
   EC50: Effect Concentration 50%
   IARC: International Agency for Research on Cancer
   LC50: Lethal Concentration 50%
   LD50: Lethal Dose 50%
   N/A: Denotes no applicable information found or available
   OSHA: Occupational Safety and Health Administration
   PEL: Permissible Exposure Limit
   STEL: Short Term Exposure Limit
   TLV: Threshold Limit Value
   TSCA: Toxic Substance Control Act

   Revision Date: October 1, 2015
   Replaces: April 10, 2015
   Changes made: Update to Section 14.

   Information Source and References
   This SDS is prepared by Hazard Communication Specialists based on information provided by internal company references.

   Prepared By: EnviroNet LLC.

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