



Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12]
MANUFACTURER: 3M
DIVISION: Electronics Markets Materials Division

ADDRESS: 3M Center
 St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 04/09/2007
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Product Use:

Intended Use: STREAMING AND FLOODING FIRE PROTECTION

SECTION 2: INGREDIENTS

| <u>Ingredient</u> | <u>C.A.S. No.</u> | <u>% by Wt</u> |
|--|-------------------|----------------|
| 1,1,1,2,2,4,5,5,5-NONAFLUORO-4-(TRIFLUOROMETHYL)-3-PENTANONE | 756-13-8 | > 99.9 |

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Liquid

Odor, Color, Grade: clear colorless, low odor.

General Physical Form: Liquid

Immediate health, physical, and environmental hazards:

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

Contact with the eyes during product use is not expected to result in significant irritation.

Skin Contact:

Contact with the skin during product use is not expected to result in significant irritation.

Inhalation:

If thermal decomposition occurs:
May be harmful if inhaled.

Ingestion:

No health effects are expected.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

This substance has a high Henry's Law constant and therefore will be primarily found in the atmosphere where photolysis will be the dominant reaction pathway. The ultimate degradation products of the photolysis reaction are HF, CO₂ and trifluoroacetic acid (TFA).

This substance does not contribute to ozone depletion; it has an atmospheric lifetime of approximately 5 days and a Global Warming Potential (GWP) of 1 (IPCC 2001 Method).

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: No need for first aid is anticipated.

Skin Contact: No need for first aid is anticipated.

Inhalation: If signs/symptoms develop, remove person to fresh air. If signs/symptoms persist, get medical attention.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

| | |
|--------------------------|-------------------------|
| Autoignition temperature | <i>Not Applicable</i> |
| Flash Point | <i>Not Applicable</i> |
| Flammable Limits - LEL | [Details: Nonflammable] |
| Flammable Limits - UEL | [Details: Nonflammable] |

5.2 EXTINGUISHING MEDIA

Product is a fire-extinguishing agent.

5.3 PROTECTION OF FIRE FIGHTERS

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Ventilate the area with fresh air. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Clean up residue. Place in a metal container approved for transportation by appropriate authorities. Seal the container. Dispose of collected material as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

For industrial or professional use only. Contents may be under pressure, open carefully. Avoid breathing of vapors, mists or spray. Do not breathe thermal decomposition products.

7.2 STORAGE

Keep container in well-ventilated area. Store out of direct sunlight. Store away from heat. Store away from strong bases, amines, and alcohols.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Provide appropriate local exhaust ventilation on open containers. Provide appropriate local exhaust when product is heated.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

As a good industrial hygiene practice:

Avoid eye contact with vapors, mists, or spray.

8.2.2 Skin Protection

Gloves are not required.

8.2.3 Respiratory Protection

Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection.

As a good industrial hygiene practice:

Avoid breathing of vapors, mists or spray.

If thermal decomposition occurs, wear supplied air respiratory protection.

8.2.4 Prevention of Swallowing

Not applicable.

8.3 EXPOSURE GUIDELINES

| <u>Ingredient</u> | <u>Authority</u> | <u>Type</u> | <u>Limit</u> | <u>Additional Information</u> |
|--|------------------|-------------|--------------|-------------------------------|
| 1,1,1,2,2,4,5,5,5-NOXAFLUORO-4-(TRIFLUOROMETHYL)-3-PENTANONE | 3M | TWA | 150 ppm | |

SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Specific Physical Form: | Liquid |
| Odor, Color, Grade: | clear colorless, low odor. |
| General Physical Form: | Liquid |
| Autoignition temperature | <i>Not Applicable</i> |
| Flash Point | <i>Not Applicable</i> |
| Flammable Limits - LEL | [<i>Details: Nonflammable</i>] |
| Flammable Limits - UEL | [<i>Details: Nonflammable</i>] |
| Boiling point | 49 °C |
| Vapor Density | 11.6 [<i>Ref Std: AIR=1</i>] |
| Vapor Pressure | 244 mmHg [<i>@ 20 °C</i>] |
| Specific Gravity | 1.6 [<i>Ref Std: WATER=1</i>] |
| pH | <i>Not Applicable</i> |
| Melting point | -108 °C |
| Solubility in Water | Nil |
| Evaporation rate | > 1 [<i>Ref Std: BUOAC=1</i>] |
| Volatile Organic Compounds | 1600 g/l [<i>Test Method: calculated SCAQMD rule 443.1</i>] |
| Percent volatile | 100 % |
| VOC Less H2O & Exempt Solvents | 1600 g/l [<i>Test Method: calculated SCAQMD rule 443.1</i>] |
| Viscosity | 0.6 centipoise [<i>@ 25 °C</i>] |

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Strong bases; Amines; Alcohols Additional Information: Listed materials to avoid should not be mixed with liquid Novec 1230 fluid. Avoid direct sunlight and ultraviolet light.

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

| <u>Substance</u> | <u>Condition</u> |
|-------------------|-------------------|
| Carbon monoxide | During Combustion |
| Carbon dioxide | During Combustion |
| Hydrogen Fluoride | During Combustion |

Hazardous Decomposition: Hydrogen fluoride has an ACGIH Threshold Limit Value of 3 parts per million (as fluoride) as a Ceiling Limit and an OSHA PEL of 3 ppm of fluoride as an eight hour Time-Weighted Average and 6 ppm of fluoride as a Short Term Exposure Limit. The odor threshold for HF is 0.04 ppm, providing good warning properties for exposure.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Please refer to existing literature on TFA

CHEMICAL FATE INFORMATION

Photolytic half-life: 3-5 days.

Photolytic degradation products may include Trifluoroacetic acid (TFA)

NOTE: Hydrolysis is not expected to be a significant degradation pathway. Product is highly insoluble in water and volatile, and use as a clean extinguishing agent would not typically result in releases to aquatic environments.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in an industrial or commercial facility in the presence of a combustible material. Combustion products will include HF. Facility must be capable of handling halogenated materials.

As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste. Reclaim if feasible. For information on product return, contact your distributor.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

ID Number(s):

98-0212-3031-7, 98-0212-3201-6, 98-0212-3203-2, 98-0212-3217-2, 98-0212-3371-7, 98-0212-3414-5

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - No Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

One or more of the components of this product have been notified to ELINCS (European List of Notified or New Chemical Substances). Certain restrictions apply. Contact the selling division for additional information.

All the components of this product are listed on China's Inventory of Chemical Substances.

The components of this material are in compliance with the new chemical notification requirements for the Korean Existing Chemicals Inventory.

Contact 3M for more information.

Additional Information: The components of this product are in compliance with the chemical notification requirements of the National Industrial Chemical Notification and Assessment Scheme (NICNAS) of Australia, the Canadian Environmental Protection Act (CEPA) and the Ministry of Economy, Trade and Industry of Japan.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

ADDITIONAL INFORMATION

U.S. EPA. Significant New Alternatives Policy Program (SNAP) approved for uses is streaming and flooding fire protection

application.

This MSDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

NFPA Hazard Classification

Health: 3 Flammability: 0 Reactivity: 1 Special Hazards: None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: 0 Flammability: 0 Reactivity: 1 Protection: X - See PPE section.

Hazardous Material Identification System (HMIS(r)) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS(r) ratings are to be used with a fully implemented HMIS(r) program. HMIS(r) is a registered mark of the National Paint and Coatings Association (NPCA).

Revision Changes:

Section 1: Product use information was modified.

Copyright was modified.

Section 14: ID Number(s) was modified.

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