



## Material Safety Data Sheet

Copyright, 2013, 3M Company All rights reserved. Copying and/or downloading of this information for the purpose of properly utilizing 3M products is allowed provided that: (1) the information is copied in full with no changes unless prior written agreement is obtained from 3M, and (2) neither the copy nor the original is resold or otherwise distributed with the intention of earning a profit thereon.

### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 3M™ Novec™ Electronic Degreaser  
**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:** 01/28/13  
**Supersedes Date:** 01/03/13

**Document Group:** 20-0406-7

#### Product Use:

**Intended Use:** For Electronics Cleaning Only. Not Intended for Use as a Medical Device or Drug.  
**Limitations on Use:** Novec™ Aerosols are used in a wide variety of applications, including but not limited to precision cleaning of medical devices and as lubricant deposition solvents for medical devices. When the product is used for applications where the finished device is implanted into the human body, no residual Novec solvent may remain on the parts. It is highly recommended that the supporting test results and protocol be cited during FDA registration.

3M Electronics Markets Materials Division (EMMD) will not knowingly sample, support, or sell its products for incorporation in medical and pharmaceutical products and applications in which the 3M product will be temporarily or permanently implanted into humans or animals. The customer is responsible for evaluating and determining that a 3M EMMD product is suitable and appropriate for its particular use and intended application. The conditions of evaluation, selection, and use of a 3M product can vary widely and affect the use and intended application of a 3M product. Because many of these conditions are uniquely within the user's knowledge and control, it is essential that the user evaluate and determine whether the 3M product is suitable and appropriate for a particular use and intended application, and complies with all local applicable laws, regulations, standards, and guidance.

**Specific Use:** Electronic Degreaser

### SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
1,2-Trans-dichloroethylene	156-60-5	65 - 72

Ethyl nonafluoroisobutyl ether	163702-06-5	6 - 16
Ethyl nonafluorobutyl ether	163702-05-4	4 - 14
Methyl nonafluoroisobutyl ether	163702-08-7	3 - 8
Methyl nonafluorobutyl ether	163702-07-6	2 - 7
Carbon dioxide	124-38-9	1 - 5

## SECTION 3: HAZARDS IDENTIFICATION

### 3.1 EMERGENCY OVERVIEW

**Specific Physical Form:** Aerosol

**Odor, Color, Grade:** Clear, colorless liquid with slight odor. Contents under pressure.

**General Physical Form:** Liquid

**Immediate health, physical, and environmental hazards:** Closed containers exposed to heat from fire may build pressure and explode. Aerosol container contains gas under pressure. May cause target organ effects.

### 3.2 POTENTIAL HEALTH EFFECTS

**Eye Contact:**

Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

**Skin Contact:**

Moderate Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness.

**Inhalation:**

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Intentional concentration and inhalation may be harmful or fatal.

If thermal decomposition occurs:

May be harmful if inhaled.

May be absorbed following inhalation and cause target organ effects.

**Ingestion:**

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

May be absorbed following ingestion and cause target organ effects.

**Target Organ Effects:**

Central Nervous System (CNS) Depression: Signs/symptoms may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness, and unconsciousness.

## 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:** Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

**Skin Contact:** Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. If signs/symptoms develop, get medical attention. Wash contaminated clothing and clean shoes before reuse.

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

**If Swallowed:** Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

#### 4.2 NOTE TO PHYSICIANS

Exposures resulting from intentional misuse and abuse may cause an increase in myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

### SECTION 5: FIRE FIGHTING MEASURES

#### 5.1 FLAMMABLE PROPERTIES

Autoignition temperature	396 °C
Flash Point	No flash point
Flammable Limits(LEL)	6.7 % volume
Flammable Limits(UEL)	13.7 % volume

#### 5.2 EXTINGUISHING MEDIA

Non-combustible. Choose material suitable for surrounding fire.

#### 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** Exposure to extreme heat can give rise to thermal decomposition. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** Closed containers exposed to heat from fire may build pressure and explode. Aerosol container contains gas under pressure.

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

### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### 6.1. Personal precautions, protective equipment and emergency procedures

If possible, seal leaking container. Place leaking containers in a well-ventilated area, preferably an operating exhaust hood, or if necessary outdoors on an impermeable surface until appropriate packaging for the leaking container or its contents is available. Ventilate the area with fresh air.

#### 6.2. Environmental precautions

Place depressurized can and clean up wastes in a closed container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

#### Clean-up methods

Contain spilled material. Clean up residue. Place depressurized can and clean up wastes in a closed container approved for transportation by appropriate authorities. Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Seal the container.

**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

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Do not pierce or burn container, even after use. Do not spray near flames or sources of ignition. Avoid breathing of vapors, mists or spray. Avoid eye contact with vapors, mists, or spray. For industrial or professional use only. No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of the hazardous decomposition products mentioned in the Reactivity Data section of this MSDS. Store work clothes separately from other clothing, food and tobacco products. Avoid contact with oxidizing agents. Avoid skin contact. Do not breathe thermal decomposition products. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

### 7.2 STORAGE

Store away from heat. Store out of direct sunlight. Keep container in well-ventilated area. Store away from oxidizing agents. Store away from strong bases.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 ENGINEERING CONTROLS

Use in a well-ventilated area. Provide appropriate local exhaust when product is heated. Do not use in a confined area or areas with little or no air movement.

### 8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

#### 8.2.1 Eye/Face Protection

Avoid eye contact with vapors, mists, or spray.

The following eye protection(s) are recommended: Safety Glasses with side shields  
Indirect Vented Goggles

.

#### 8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Fluoroelastomer

Polymer laminate

.

#### 8.2.3 Respiratory Protection

Avoid breathing of vapors, mists or spray. Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection.

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Half facepiece or full facepiece air-purifying respirator suitable for organic vapors

For questions about suitability for a specific application, consult with your respirator manufacturer.

#### 8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

### 8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
1,2-Trans-dichloroethylene	ACGIH	TWA	200 ppm	
Methyl nonafluorobutyl ether	AIHA	TWA	750 ppm	
Carbon dioxide	ACGIH	TWA	5000 ppm	
Carbon dioxide	ACGIH	STEL	30000 ppm	
Carbon dioxide	OSHA	TWA	9000 mg/m3	
Ethene, 1,2-dichloro-	ACGIH	TWA	200 ppm	
Ethene, 1,2-dichloro-	OSHA	TWA	790 mg/m3	
Ethyl nonafluorobutyl ether	Manufacturer determined	TWA, as total isomers	200 ppm	
Ethyl nonafluoroisobutyl ether	Manufacturer determined	TWA, as total isomers	200 ppm	
Methyl nonafluoroisobutyl ether	AIHA	TWA	750 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

<b>Specific Physical Form:</b>	Aerosol
<b>Odor, Color, Grade:</b>	Clear, colorless liquid with slight odor. Contents under pressure.
<b>General Physical Form:</b>	Liquid
<b>Autoignition temperature</b>	396 °C
<b>Flash Point</b>	No flash point
<b>Flammable Limits(LEL)</b>	6.7 % volume
<b>Flammable Limits(UEL)</b>	13.7 % volume
<b>Boiling Point</b>	43 °C
<b>Density</b>	1.28 g/ml
<b>Vapor Density</b>	No Data Available
<b>Vapor Pressure</b>	330 mmHg [ <i>@ 25 °C</i> ] [ <i>Details: Internal pressure for aerosol can is approximately 75 psig @25C.</i> ]
<b>Specific Gravity</b>	1.28 [ <i>Ref Std: WATER=1</i> ]
<b>pH</b>	Not Applicable
<b>Melting point</b>	Not Applicable
<b>Solubility in Water</b>	Negligible
<b>Evaporation rate</b>	No Data Available
<b>Volatile Organic Compounds</b>	67 % [ <i>Details: by weight</i> ]
<b>Kow - Oct/Water partition coef</b>	No Data Available
<b>Percent volatile</b>	100 %
<b>VOC Less H2O &amp; Exempt Solvents</b>	67 % [ <i>Details: by weight</i> ]
<b>Viscosity</b>	0.45 centipoise

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** Stable.

**Materials and Conditions to Avoid:**

**10.1 Conditions to avoid**

Heat

**10.2 Materials to avoid**

Strong bases

Strong oxidizing agents

**Hazardous Polymerization:** Hazardous polymerization will not occur.

**Hazardous Decomposition or By-Products**

**Substance**

Hydrogen Chloride

Hydrogen Fluoride

Perfluoroisobutylene (PFIB)

**Condition**

At Elevated Temperatures - extreme conditions of heat

At Elevated Temperatures - extreme conditions of heat

At Elevated Temperatures - extreme conditions of heat

**Hazardous Decomposition:** Perfluorinated Acid Fluorides

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.

Decomposition of this product at temperatures above 300 degrees C can form perfluoroisobutylene (PFIB), but PFIB will only accumulate with continuous exposure to excessive heat in a sealed vessel. The formation rate for PFIB is about 1000 times less than the rate for primary thermal decomposition products such as HF. During normal use conditions, no health hazard is associated with the use of this material due to PFIB exposure.

**SECTION 11: TOXICOLOGICAL INFORMATION**

**Component-Based Toxicology Information:**

For a mixture of ethyl nonafluorobutyl ether and its isomer, a single positive response for cardiac sensitization was observed at an exposure level of 49,000 ppm. No adverse health effects are anticipated from normal handling and use.

**SECTION 12: ECOLOGICAL INFORMATION**

**ECOTOXICOLOGICAL INFORMATION**

Available upon request

**CHEMICAL FATE INFORMATION**

Available upon request

**SECTION 13: DISPOSAL CONSIDERATIONS**

**Waste Disposal Method:** Combustion products will include HF and HCl. Facility must be capable of handling halogenated materials.

Dispose of waste product in a facility permitted to accept chemical waste. Dispose of empty product containers in a sanitary landfill. Facility must be capable of handling aerosol cans.

EPA Hazardous Waste Number (RCRA): Not regulated

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

## SECTION 14: TRANSPORT INFORMATION

### ID Number(s):

98-0212-3292-5, 98-0212-3325-3, 98-0212-3338-6, 98-0212-3462-4

For Transport Information, please visit <http://3M.com/Transportinfo> or call 1-800-364-3577 or 651-737-6501.

## SECTION 15: REGULATORY INFORMATION

### US FEDERAL REGULATIONS

Contact 3M for more information.

### 311/312 Hazard Categories:

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

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

<u>Ingredient</u>	<u>C.A.S. No</u>	<u>% by Wt</u>
1,2-Trans-dichloroethylene (Ethene, 1,2-dichloro-)	156-60-5	65 - 72

### STATE REGULATIONS

Contact 3M for more information.

### CHEMICAL INVENTORIES

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

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS. Contact 3M for more information.

### INTERNATIONAL REGULATIONS

Contact 3M for more information.

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: 1 Reactivity: 0 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: 2 Flammability: 1 Reactivity: 0 Protection: X - See PPE section.**

Hazardous Material Identification System (HMIS®) 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® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint and Coatings Association (NPCA).

**Revision Changes:**

Section 1: Product use information was modified.

**DISCLAIMER:** The information in this Material Safety Data Sheet (MSDS) is believed to be correct as of the date issued. 3M MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the 3M product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a 3M product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

3M provides information in electronic form as a service to its customers. Due to the remote possibility that electronic transfer may have resulted in errors, omissions or alterations in this information, 3M makes no representations as to its completeness or accuracy. In addition, information obtained from a database may not be as current as the information in the MSDS available directly from 3M

**3M USA MSDSs are available at [www.3M.com](http://www.3M.com)**





# Transport Information Document

**Date:** August 05, 2010

**3M ID Number:** 98-0212-3292-5

**Product Description:** 3M(TM) Novec(TM) Electronic Degreaser, 12 oz can, 6 can per case

**Transport Protective Service:** PROTECTIVE SERVICE NOT REQUIRED

**NMFC Item:** 048580

**NMFC Sub:** 03

**NMFC Class:** 055.0

**Flash Point (Closed-cup):** No Flash Point

## UNITED STATES DEPARTMENT OF TRANSPORTATION - GROUND (U.S. DOT, 49 CFR)

CONSUMER COMMODITY, ORM-D

## UNITED STATES DEPARTMENT OF TRANSPORTATION - VESSEL (U.S. DOT, 49 CFR)

CONSUMER COMMODITY, ORM-D

## INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA)

UN1950, AEROSOLS, NON-FLAMMABLE, 2.2

## INTERNATIONAL MARITIME ORGANIZATION (IMO)

UN1950, AEROSOLS, 2.2, LIMITED QUANTITY

The classification is authorized by the Competent Authority of the United States of America and may not meet the requirements of other competent authorities.

These transportation classifications are provided as a customer service. AS THE SHIPPER YOU REMAIN RESPONSIBLE FOR COMPLYING WITH ALL THE APPLICABLE LAWS AND REGULATIONS, INCLUDING PROPER TRANSPORTATION CLASSIFICATION AND PACKAGING. 3M's transportation classifications are based on product formulations, packaging, 3M policies and 3M's understanding of applicable current regulations and is valid for the original 3M package only. 3M does not guarantee the accuracy of this classification information. This information applies only to transportation classification and NOT THE PACKAGING, LABELING, OR MARKING REQUIREMENTS. The original 3M package is certified for U.S. ground shipment only. If you are shipping by air or ocean, the package may not meet applicable regulatory requirements.

For Transport Information, please visit [3M.com/Transportinfo](http://3M.com/Transportinfo)  
or call 1-800-364-3577 or 651-737-6501 for assistance.