



## Safety Data Sheet

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|                        |           |                         |          |
|------------------------|-----------|-------------------------|----------|
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### SECTION 1: Identification

#### 1.1. Product identifier

3M™ Novec™ Electronic Degreaser

#### Product Identification Numbers

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

#### 1.2. Recommended use and restrictions on use

##### Recommended use

For Electronics Cleaning Only. Not Intended for Use as a Medical Device or Drug., Electronic Degreaser

##### Restrictions 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.

#### 1.3. Supplier's details

|                      |   |
|----------------------|---|
| <b>MANUFACTURER:</b> | 3M                                      |
| <b>DIVISION:</b>     | Electronics Markets Materials Division  |
| <b>ADDRESS:</b>      | 3M Center, St. Paul, MN 55144-1000, USA |
| <b>Telephone:</b>    | 1-888-3M HELPS (1-888-364-3577)         |

#### 1.4. Emergency telephone number

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

### SECTION 2: Hazard identification

#### 2.1. Hazard classification

Simple Asphyxiant.

Specific Target Organ Toxicity (central nervous system): Category 3.

## 2.2. Label elements

### Signal word

Warning

### Symbols

Exclamation mark |

### Pictograms



### Hazard Statements

May cause drowsiness or dizziness.

May displace oxygen and cause rapid suffocation.

### Precautionary Statements

#### Prevention:

Avoid breathing dust/fume/gas/mist/vapors/spray.

Use only outdoors or in a well-ventilated area.

#### Response:

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.

#### Storage:

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

#### Disposal:

Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

## 2.3. Hazards not otherwise classified

Intentional misuse by deliberately concentrating and inhaling contents can be harmful or fatal.

## SECTION 3: Composition/information on ingredients

| Ingredient                      | C.A.S. No.  | % by Wt |
|---------------------------------|-------------|---------|
| 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 4: First aid measures

### 4.1. Description of first aid measures

**Inhalation:**

Remove person to fresh air. If you feel unwell, get medical attention.

**Skin Contact:**

Wash with soap and water. If you feel unwell, get medical attention.

**Eye Contact:**

No need for first aid is anticipated.

**If Swallowed:**

Rinse mouth. If you feel unwell, get medical attention.

**4.2. Most important symptoms and effects, both acute and delayed**

See Section 11.1. Information on toxicological effects.

**4.3. Indication of any immediate medical attention and special treatment required**

Not applicable

## SECTION 5: Fire-fighting measures

**5.1. Suitable extinguishing media**

Use a fire fighting agent suitable for the surrounding fire.

**5.2. Special hazards arising from the substance or mixture**

Closed containers exposed to heat from fire may build pressure and explode. Exposure to extreme heat can give rise to thermal decomposition.

**5.3. Special protective actions for fire-fighters**

When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

## SECTION 6: Accidental release measures

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

Evacuate area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Ventilate the area with fresh air. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

**6.2. Environmental precautions**

Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

**6.3. Methods and material for containment and cleaning up**

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. Contain spill. 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. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible.

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling**

Do not breathe thermal decomposition products. Avoid skin contact with hot material. For industrial or professional use only. Store work clothes separately from other clothing, food and tobacco products. Do not pierce or burn, even after use. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of hazardous decomposition products.

**7.2. Conditions for safe storage including any incompatibilities**

Store in a well-ventilated place. Keep container tightly closed. Protect from sunlight. Do not expose to temperatures exceeding 50C/122F. Store away from heat. Store away from strong bases. Store away from oxidizing agents.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Occupational exposure limits**

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

| <b>Ingredient</b>               | <b>C.A.S. No.</b> | <b>Agency</b>           | <b>Limit type</b>             | <b>Additional Comments</b> |
|---------------------------------|-------------------|-------------------------|-------------------------------|----------------------------|
| Carbon dioxide                  | 124-38-9          | OSHA                    | TWA:9000 mg/m3(5000 ppm)      |                            |
| Carbon dioxide                  | 124-38-9          | ACGIH                   | TWA:5000 ppm;STEL:30000 ppm   |                            |
| 1,2-Trans-dichloroethylene      | 156-60-5          | ACGIH                   | TWA:200 ppm                   |                            |
| Ethene, 1,2-dichloro-           | 156-60-5          | OSHA                    | TWA:790 mg/m3(200 ppm)        |                            |
| Ethyl nonafluorobutyl ether     | 163702-05-4       | Manufacturer determined | TWA(as total isomers):200 ppm |                            |
| Ethyl nonafluoroisobutyl ether  | 163702-06-5       | Manufacturer determined | TWA(as total isomers):200 ppm |                            |
| Methyl nonafluorobutyl ether    | 163702-07-6       | AIHA                    | TWA:750 ppm                   |                            |
| Methyl nonafluoroisobutyl ether | 163702-08-7       | AIHA                    | TWA:750 ppm                   |                            |

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

CMRG : Chemical Manufacturer's Recommended Guidelines

OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

**8.2. Exposure controls****8.2.1. Engineering controls**

Provide appropriate local exhaust when product is heated. Do not remain in area where available oxygen may be reduced. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

**8.2.2. Personal protective equipment (PPE)****Eye/face protection**

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:

Indirect Vented Goggles

**Skin/hand protection**

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

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

**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:

During heating:

Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

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.

**Thermal hazards**

Wear heat insulating gloves when handling hot material to prevent thermal burns.

## SECTION 9: Physical and chemical properties

**9.1. Information on basic physical and chemical properties**

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

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

### 10.2. Chemical stability

Stable.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

### 10.4. Conditions to avoid

Heat

### 10.5. Incompatible materials

Strong bases

Strong oxidizing agents

### 10.6. Hazardous decomposition 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

If the product is exposed to extreme condition of heat from misuse or equipment failure, toxic decomposition products that include hydrogen fluoride and perfluoroisobutylene can occur.

## SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

### 11.1. Information on Toxicological effects

#### Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

#### **Inhalation:**

Intentional concentration and inhalation may be harmful or fatal.

Simple Asphyxiation: Signs/symptoms may include increased heart rate, rapid respirations, drowsiness, headache, incoordination, altered judgement, nausea, vomiting, lethargy, seizures, coma, and may be fatal.

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

**Skin Contact:**

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

**Eye Contact:**

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

**Ingestion:**

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

May cause target organ effects after ingestion.

**Target Organ Effects:****Single exposure may cause:**

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

**Toxicological Data**

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

**Acute Toxicity**

| Name                            | Route                      | Species | Value   |
|---------------------------------|----------------------------|---------|---|
| Overall product                 | Inhalation-Vapor(4 hr)     |         | No data available; calculated ATE > 50 mg/l     |
| Overall product                 | Ingestion                  |         | No data available; calculated ATE > 5,000 mg/kg |
| 1,2-Trans-dichloroethylene      | Dermal                     | Rabbit  | LD50 > 5,000 mg/kg                              |
| 1,2-Trans-dichloroethylene      | Inhalation-Vapor (4 hours) | Rat     | LC50 95.6 mg/l                                  |
| 1,2-Trans-dichloroethylene      | Ingestion                  | Rat     | LD50 7,902 mg/kg                                |
| Ethyl nonafluorobutyl ether     | Inhalation-Vapor (4 hours) | Rat     | LC50 > 989 mg/l                                 |
| Ethyl nonafluorobutyl ether     | Ingestion                  | Rat     | LD50 > 2,000 mg/kg                              |
| Ethyl nonafluoroisobutyl ether  | Inhalation-Vapor (4 hours) | Rat     | LC50 > 989 mg/l                                 |
| Ethyl nonafluoroisobutyl ether  | Ingestion                  | Rat     | LD50 > 2,000 mg/kg                              |
| Methyl nonafluorobutyl ether    | Inhalation-Vapor (4 hours) | Rat     | LC50 > 1,000 mg/l                               |
| Methyl nonafluorobutyl ether    | Ingestion                  | Rat     | LD50 > 5,000 mg/kg                              |
| Methyl nonafluoroisobutyl ether | Inhalation-Vapor (4 hours) | Rat     | LC50 > 1,000 mg/l                               |
| Methyl nonafluoroisobutyl ether | Ingestion                  | Rat     | LD50 > 5,000 mg/kg                              |
| Carbon dioxide                  | Inhalation-Gas (4 hours)   | Rat     | LC50 > 53,000 ppm                               |

ATE = acute toxicity estimate

**Skin Corrosion/Irritation**

| Name                            | Species | Value                     |
|---------------------------------|---------|---------------------------|
| 1,2-Trans-dichloroethylene      | Rabbit  | Minimal irritation        |
| Ethyl nonafluorobutyl ether     | Rabbit  | No significant irritation |
| Ethyl nonafluoroisobutyl ether  | Rabbit  | No significant irritation |
| Methyl nonafluorobutyl ether    | Rabbit  | No significant irritation |
| Methyl nonafluoroisobutyl ether | Rabbit  | No significant irritation |

**Serious Eye Damage/Irritation**

| Name                            | Species | Value                     |
|---------------------------------|---------|---------------------------|
| 1,2-Trans-dichloroethylene      | Rabbit  | Moderate irritant         |
| Ethyl nonafluorobutyl ether     | Rabbit  | No significant irritation |
| Ethyl nonafluoroisobutyl ether  | Rabbit  | No significant irritation |
| Methyl nonafluorobutyl ether    | Rabbit  | No significant irritation |
| Methyl nonafluoroisobutyl ether | Rabbit  | No significant irritation |

**Skin Sensitization**

| Name                            | Species    | Value           |
|---------------------------------|------------|-----------------|
| Ethyl nonafluorobutyl ether     | Guinea pig | Not sensitizing |
| Ethyl nonafluoroisobutyl ether  | Guinea pig | Not sensitizing |
| Methyl nonafluorobutyl ether    | Guinea pig | Not sensitizing |
| Methyl nonafluoroisobutyl ether | Guinea pig | Not sensitizing |

**Respiratory Sensitization**

| Name | Species | Value |
|------|---------|-------|
|------|---------|-------|

**Germ Cell Mutagenicity**

| Name                            | Route    | Value         |
|---------------------------------|----------|---------------|
| 1,2-Trans-dichloroethylene      | In Vitro | Not mutagenic |
| 1,2-Trans-dichloroethylene      | In vivo  | Not mutagenic |
| Ethyl nonafluorobutyl ether     | In Vitro | Not mutagenic |
| Ethyl nonafluorobutyl ether     | In vivo  | Not mutagenic |
| Ethyl nonafluoroisobutyl ether  | In Vitro | Not mutagenic |
| Ethyl nonafluoroisobutyl ether  | In vivo  | Not mutagenic |
| Methyl nonafluorobutyl ether    | In Vitro | Not mutagenic |
| Methyl nonafluorobutyl ether    | In vivo  | Not mutagenic |
| Methyl nonafluoroisobutyl ether | In Vitro | Not mutagenic |
| Methyl nonafluoroisobutyl ether | In vivo  | Not mutagenic |

**Carcinogenicity**

| Name | Route | Species | Value |
|------|-------|---------|-------|
|------|-------|---------|-------|

**Reproductive Toxicity****Reproductive and/or Developmental Effects**

| Name                        | Route      | Value  | Species | Test Result           | Exposure Duration    |
|-----------------------------|------------|--|---------|-----------------------|----------------------|
| 1,2-Trans-dichloroethylene  | Ingestion  | Not toxic to female reproduction   | Rat     | NOAEL 3,000 mg/kg/day | 90 days              |
| 1,2-Trans-dichloroethylene  | Inhalation | Not toxic to female reproduction   | Rat     | NOAEL 16 mg/l         | 90 days              |
| 1,2-Trans-dichloroethylene  | Ingestion  | Not toxic to male reproduction   | Rat     | NOAEL 3,000 mg/kg/day | 90 days              |
| 1,2-Trans-dichloroethylene  | Inhalation | Not toxic to male reproduction   | Rat     | NOAEL 16 mg/l         | 90 days              |
| 1,2-Trans-dichloroethylene  | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification | Rat     | NOAEL 24 mg/l         | during organogenesis |
| Ethyl nonafluorobutyl ether | Ingestion  | Not toxic to female reproduction   | Rat     | NOAEL 1,000 mg/kg/day | 28 days              |
| Ethyl nonafluorobutyl ether | Inhalation | Not toxic to female reproduction   | Rat     | NOAEL 260.1 mg/l      | during gestation     |
| Ethyl nonafluorobutyl ether | Ingestion  | Not toxic to male reproduction   | Rat     | NOAEL 1,000 mg/kg/day | 28 days              |



|                                 |            |  |       |                          |                  |
|---------------------------------|------------|--|-------|--------------------------|------------------|
| Ethyl nonafluorobutyl ether     | Inhalation | Not toxic to male reproduction   | Rat   | NOAEL<br>263.4 mg/l      | 4 weeks          |
| Ethyl nonafluorobutyl ether     | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification     | Rat   | NOAEL 260 mg/l           | during gestation |
| Ethyl nonafluoroisobutyl ether  | Ingestion  | Not toxic to female reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Ethyl nonafluoroisobutyl ether  | Inhalation | Not toxic to female reproduction   | Rat   | NOAEL<br>260.1 mg/l      | during gestation |
| Ethyl nonafluoroisobutyl ether  | Ingestion  | Not toxic to male reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Ethyl nonafluoroisobutyl ether  | Inhalation | Not toxic to male reproduction   | Rat   | NOAEL<br>263.4 mg/l      | 4 weeks          |
| Ethyl nonafluoroisobutyl ether  | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification     | Rat   | NOAEL 260 mg/l           | during gestation |
| Methyl nonafluorobutyl ether    | Ingestion  | Not toxic to female reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Methyl nonafluorobutyl ether    | Inhalation | Not toxic to female reproduction   | Rat   | NOAEL 129 mg/l           | 1 generation     |
| Methyl nonafluorobutyl ether    | Ingestion  | Not toxic to male reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Methyl nonafluorobutyl ether    | Inhalation | Not toxic to male reproduction   | Rat   | NOAEL 129 mg/l           | 1 generation     |
| Methyl nonafluorobutyl ether    | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification     | Rat   | NOAEL 307 mg/l           | during gestation |
| Methyl nonafluoroisobutyl ether | Ingestion  | Not toxic to female reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Methyl nonafluoroisobutyl ether | Inhalation | Not toxic to female reproduction   | Rat   | NOAEL 129 mg/l           | 1 generation     |
| Methyl nonafluoroisobutyl ether | Ingestion  | Not toxic to male reproduction   | Rat   | NOAEL<br>1,000 mg/kg/day | 28 days          |
| Methyl nonafluoroisobutyl ether | Inhalation | Not toxic to male reproduction   | Rat   | NOAEL 129 mg/l           | 1 generation     |
| Methyl nonafluoroisobutyl ether | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification     | Rat   | NOAEL 307 mg/l           | during gestation |
| Carbon dioxide                  | Inhalation | Some positive male reproductive data exist, but the data are not sufficient for classification | Mouse | LOAEL<br>350,000 ppm     | not available    |
| Carbon dioxide                  | Inhalation | Some positive developmental data exist, but the data are not sufficient for classification     | Rat   | LOAEL<br>60,000 ppm      | 24 hours         |

## Target Organ(s)

### Specific Target Organ Toxicity - single exposure

| Name                        | Route      | Target Organ(s)                   | Value  | Species | Test Result          | Exposure Duration     |
|-----------------------------|------------|-----------------------------------|--|---------|----------------------|-----------------------|
| 1,2-Trans-dichloroethylene  | Inhalation | central nervous system depression | Some positive data exist, but the data are not sufficient for classification | Human   | NOAEL Not available  | occupational exposure |
| 1,2-Trans-dichloroethylene  | Inhalation | respiratory irritation            | Some positive data exist, but the data are not sufficient for classification |         | NOAEL Not available  |                       |
| 1,2-Trans-dichloroethylene  | Ingestion  | central nervous system depression | May cause drowsiness or dizziness  | Rat     | LOAEL<br>4,500 mg/kg | not applicable        |
| Ethyl nonafluorobutyl ether | Inhalation | cardiac sensitization             | Some positive data exist, but the data are not sufficient for classification | Dog     | NOAEL 204 mg/l       | 17 minutes            |

|                                 |            |                        |  |     |                |            |
|---------------------------------|------------|------------------------|--|-----|----------------|------------|
| Ethyl nonafluoroisobutyl ether  | Inhalation | cardiac sensitization  | Some positive data exist, but the data are not sufficient for classification | Dog | NOAEL 204 mg/l | 17 minutes |
| Ethyl nonafluorobutyl ether     | Inhalation | respiratory irritation | All data are negative  | Rat | NOAEL 989 mg/l | 4 hours    |
| Ethyl nonafluoroisobutyl ether  | Inhalation | respiratory irritation | All data are negative  | Rat | NOAEL 989 mg/l | 4 hours    |
| Methyl nonafluorobutyl ether    | Inhalation | nervous system         | Some positive data exist, but the data are not sufficient for classification | Dog | LOAEL 913 mg/l | 10 minutes |
| Methyl nonafluoroisobutyl ether | Inhalation | nervous system         | Some positive data exist, but the data are not sufficient for classification | Dog | LOAEL 913 mg/l | 10 minutes |
| Methyl nonafluorobutyl ether    | Inhalation | cardiac sensitization  | All data are negative  | Dog | NOAEL 913 mg/l | 10 minutes |
| Methyl nonafluoroisobutyl ether | Inhalation | cardiac sensitization  | All data are negative  | Dog | NOAEL 913 mg/l | 10 minutes |

**Specific Target Organ Toxicity - repeated exposure**

| Name                           | Route      | Target Organ(s)   | Value  | Species | Test Result           | Exposure Duration |
|--------------------------------|------------|---|--|---------|-----------------------|-------------------|
| 1,2-Trans-dichloroethylene     | Inhalation | endocrine system   liver   kidney and/or bladder   respiratory system   | All data are negative  | Rat     | NOAEL 16 mg/l         | 90 days           |
| 1,2-Trans-dichloroethylene     | Ingestion  | kidney and/or bladder   | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 2,000 mg/kg/day | 14 weeks          |
| 1,2-Trans-dichloroethylene     | Ingestion  | blood   liver   | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 125 mg/kg/day   | 14 weeks          |
| 1,2-Trans-dichloroethylene     | Ingestion  | heart   immune system   respiratory system  | All data are negative  | Rat     | NOAEL 2,000 mg/kg/day | 14 weeks          |
| Ethyl nonafluorobutyl ether    | Inhalation | liver   kidney and/or bladder   respiratory system  | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 263.4 mg/l      | 4 weeks           |
| Ethyl nonafluoroisobutyl ether | Inhalation | liver   kidney and/or bladder   respiratory system  | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 263.4 mg/l      | 4 weeks           |
| Ethyl nonafluorobutyl ether    | Inhalation | heart   endocrine system   bone marrow   hematopoietic system   immune system   nervous system                      | All data are negative  | Rat     | NOAEL 263.4 mg/l      | 4 weeks           |
| Ethyl nonafluoroisobutyl ether | Inhalation | heart   endocrine system   bone marrow   hematopoietic system   immune system   nervous system                      | All data are negative  | Rat     | NOAEL 263.4 mg/l      | 4 weeks           |
| Ethyl nonafluorobutyl ether    | Ingestion  | blood   liver   kidney and/or bladder   | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 1,000 mg/kg/day | 28 days           |
| Ethyl nonafluoroisobutyl ether | Ingestion  | blood   liver   kidney and/or bladder   | Some positive data exist, but the data are not sufficient for classification | Rat     | NOAEL 1,000 mg/kg/day | 28 days           |
| Ethyl nonafluorobutyl ether    | Ingestion  | heart   endocrine system   bone marrow   hematopoietic system   immune system   nervous system   respiratory system | All data are negative  | Rat     | NOAEL 1,000 mg/kg/day | 28 days           |

|                                 |            |   |  |     |                       |          |
|---------------------------------|------------|---|--|-----|-----------------------|----------|
| Ethyl nonafluoroisobutyl ether  | Ingestion  | heart   endocrine system   bone marrow   hematopoietic system   immune system   nervous system   respiratory system                                   | All data are negative  | Rat | NOAEL 1,000 mg/kg/day | 28 days  |
| Methyl nonafluorobutyl ether    | Inhalation | liver   | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 155 mg/l        | 13 weeks |
| Methyl nonafluoroisobutyl ether | Inhalation | liver   | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 155 mg/l        | 13 weeks |
| Methyl nonafluorobutyl ether    | Inhalation | bone, teeth, nails, and/or hair   | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 129 mg/l        | 11 weeks |
| Methyl nonafluoroisobutyl ether | Inhalation | bone, teeth, nails, and/or hair   | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 129 mg/l        | 11 weeks |
| Methyl nonafluorobutyl ether    | Inhalation | heart   skin   endocrine system   hematopoietic system   immune system   muscles   nervous system   eyes   kidney and/or bladder   respiratory system | All data are negative  | Rat | NOAEL 155 mg/l        | 13 weeks |
| Methyl nonafluoroisobutyl ether | Inhalation | heart   skin   endocrine system   hematopoietic system   immune system   muscles   nervous system   eyes   kidney and/or bladder   respiratory system | All data are negative  | Rat | NOAEL 155 mg/l        | 13 weeks |
| Methyl nonafluorobutyl ether    | Ingestion  | endocrine system   liver  | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 1,000 mg/kg/day | 28 days  |
| Methyl nonafluoroisobutyl ether | Ingestion  | endocrine system   liver  | Some positive data exist, but the data are not sufficient for classification | Rat | NOAEL 1,000 mg/kg/day | 28 days  |
| Methyl nonafluorobutyl ether    | Ingestion  | heart   hematopoietic system   immune system   nervous system   eyes   kidney and/or bladder   respiratory system                                     | All data are negative  | Rat | NOAEL 1,000 mg/kg/day | 28 days  |
| Methyl nonafluoroisobutyl ether | Ingestion  | heart   hematopoietic system   immune system   nervous system   eyes   kidney and/or bladder   respiratory system                                     | All data are negative  | Rat | NOAEL 1,000 mg/kg/day | 28 days  |
| Carbon dioxide                  | Inhalation | heart   bone, teeth, nails, and/or hair   liver   nervous system   kidney and/or bladder   respiratory system   | Some positive data exist, but the data are not sufficient for classification | Rat | LOAEL 60,000 ppm      | 166 days |

## Aspiration Hazard

Name

Value

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

## SECTION 12: Ecological information

### Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

### Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Facility must be capable of handling aerosol cans. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

## SECTION 14: Transport Information

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

## SECTION 15: Regulatory information

### 15.1. 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        |

### 15.2. State Regulations

Contact 3M for more information.

### 15.3. Chemical Inventories

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

Contact 3M for more information.

### 15.4. International Regulations

Contact 3M for more information.

**This SDS 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 Instability: 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 Physical Hazard: 0 Personal Protection: X** - See PPE section.

Hazardous Material Identification System (HMIS® III) 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® III ratings are to be used with a fully implemented HMIS® III program. HMIS® is a registered mark of the American Coatings Association (ACA).

|                        |           |                         |          |
|------------------------|-----------|-------------------------|----------|
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3M USA SDSs are available at [www.3M.com](http://www.3M.com)



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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