# Safety Data Sheet

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## SECTION 1: Identification

### 1.1. Product identifier

3M™ Fluorinert™ Electronic Liquid FC-3243

**Product Identification Numbers**

| ID Number | UPC | ID Number | UPC |
|---|---|---|---|
| 60-0003-4008-7 | | UU-0112-6392-6 | |

7100244158, 7100305513

### 1.2. Recommended use and restrictions on use

**Recommended use**

Not Intended for Use as a Medical Device or Drug. For Industrial Use Only. Heat Transfer Fluid for Electronics.

**Restrictions on use**

Fluorinert™ Electronic Liquids 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 Fluorinert solvent may remain on the parts. It is highly recommended that the supporting test results and protocol be cited during FDA registration.
3M Electronics Materials Solutions Division (EMSD) 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 EMSD 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

| | |
|---|---|
| **MANUFACTURER:** | 3M |
| **DIVISION:** | Electronics Materials Solutions Division |
| **ADDRESS:** | 3M Center, St. Paul, MN 55144-1000, USA |
| **Telephone:** | 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**
Not classified as hazardous according to OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**2.2. Label elements**
**Signal word**
Not applicable.

**Symbols**
Not applicable.

**Pictograms**
Not applicable.

## SECTION 3: Composition/information on ingredients

| Ingredient | C.A.S. No. | % by Wt |
|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | 86508-42-1 | 48 - 55 |
| Perfluoro compounds (Primarily compounds with 12 carbons) | 86508-42-1 | 45 - 52 |

## SECTION 4: First aid measures

**4.1. Description of first aid measures**

**Inhalation:**
No need for first aid is anticipated. If symptoms develop, remove the affected person to fresh air. Get medical attention.

**Skin Contact:**
If exposed, wash with soap and water. If signs/symptoms develop, get medical attention.

**Eye Contact:**
If exposed, flush eyes with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms develop, get medical attention.

**If Swallowed:**
Do not induce vomiting. Rinse mouth. If you feel unwell, get medical attention.

**4.2. Most important symptoms and effects, both acute and delayed**
No critical symptoms or effects. 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**
Exposure to extreme heat can give rise to thermal decomposition.

**Hazardous Decomposition or By-Products**

| Substance | Condition |
|---|---|
| Carbon monoxide | During Combustion |
| Carbon dioxide | During Combustion |

**5.3. Special protective actions for fire-fighters**
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**
Ventilate the area with fresh air. Use personal protective equipment based on the results of an exposure assessment. Refer to Section 8 for PPE recommendations. If anticipated exposure resulting from an accidental release exceeds the protective capabilities of the PPE listed in Section 8, or are unknown, select PPE that offers an appropriate level of protection. Consider the physical and chemical hazards of the material when doing so. Examples of PPE ensembles for emergency response could include wearing bunker gear for a release of flammable material; wearing chemical protective clothing if the spilled material is a corrosive, a sensitizer, a significant dermal irritant, or can be absorbed through the skin; or donning a positive pressure supplied-air respirator for chemicals with inhalation hazards. For information regarding physical and health hazards, refer to sections 2 and 11 of the SDS.

**6.2. Environmental precautions**
Avoid release to the environment.

**6.3. Methods and material for containment and cleaning up**
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 in accordance with applicable local/regional/national/international regulations.

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling**
Do not breathe thermal decomposition products. Store work clothes separately from other clothing, food and tobacco products. Avoid release to the environment. Keep away from reactive metals (eg. Aluminum, zinc etc.) to avoid the formation of hydrogen gas that could create an explosion hazard. 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 away from heat.

## SECTION 8: Exposure controls/personal protection

**8.1. Control parameters**

**Occupational exposure limits**
No occupational exposure limit values exist for any of the components listed in Section 3 of this SDS.

**8.2. Exposure controls**

**8.2.1. Engineering controls**
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with

appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines.

**8.2.2. Personal protective equipment (PPE)**

**Eye/face protection**
None required.

**Skin/hand protection**
Chemical protective gloves are not required under normal use conditions. However, when the product is subjected to extreme heat, HF may be formed. For those cases, neoprene gloves and apron are recommended.

**Respiratory protection**

For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use a positive pressure supplied-air respirator.

## SECTION 9: Physical and chemical properties

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

| | |
|---|---|
| **Appearance** | |
| **Physical state** | Liquid |
| **Color** | Colorless |
| **Odor** | Odorless |
| **Odor threshold** | *No Data Available* |
| **pH** | *No Data Available* |
| **Melting point** | *Not Applicable* |
| **Boiling Point** | 139 - 142 ºC |
| **Flash Point** | No flash point |
| **Evaporation rate** | 1 |
| **Flammability (solid, gas)** | Not Applicable |
| **Flammable Limits(LEL)** | None detected |
| **Flammable Limits(UEL)** | None detected |
| **Vapor Pressure** | .36 kPa |
| **Vapor Density** | *No Data Available* |
| **Density** | 1.836 g/ml |
| **Specific Gravity** | 1.836 [*Ref Std:*WATER=1] |
| **Solubility in Water** | Nil |
| **Solubility- non-water** | *No Data Available* |
| **Partition coefficient: n-octanol/ water** | *No Data Available* |
| **Autoignition temperature** | *Not Applicable* |
| **Decomposition temperature** | *Not Applicable* |
| **Viscosity** | 1.2 centistoke [@ 25 ºC ] |
| **Molecular weight** | *Not Applicable* |
| **Percent volatile** | *Not Applicable* |

## 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**
Finely divided active metals
Alkali and alkaline earth metals

**10.6. Hazardous decomposition products**

| Substance | Condition |
|---|---|
| Hydrogen Fluoride | At Elevated Temperatures - greater than 200 ºC |
| Perfluoroisobutylene (PFIB) | At Elevated Temperatures - greater than 200 ºC |

Refer to section 5.2 for hazardous decomposition products during combustion.

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:**
No known health effects.

**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:**
No known health effects.

**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 | Ingestion | | No data available; calculated ATE >5,000 mg/kg |
| Perfluoro compounds (Primarily compounds with 9 carbons) | Dermal | Professional judgeme | LD50 estimated to be > 5,000 mg/kg |

| | | | |
|---|---|---|---|
| | | nt | |
| Perfluoro compounds (Primarily compounds with 9 carbons) | Inhalation-Vapor (4 hours) | Rat | LC50 > 120 mg/l |
| Perfluoro compounds (Primarily compounds with 9 carbons) | Ingestion | Rat | LD50 > 5,000 mg/kg |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Dermal | Professional judgement | LD50 estimated to be > 5,000 mg/kg |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Inhalation-Vapor (4 hours) | Rat | LC50 > maximum possible concentration |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Ingestion | Rat | LD50 > 10,000 mg/kg |

ATE = acute toxicity estimate

**Skin Corrosion/Irritation**

| Name | Species | Value |
|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | Rabbit | No significant irritation |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Rabbit | No significant irritation |

**Serious Eye Damage/Irritation**

| Name | Species | Value |
|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | Rabbit | No significant irritation |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Rabbit | No significant irritation |

**Skin Sensitization**

| Name | Species | Value |
|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | similar compounds | Not classified |

**Respiratory Sensitization**

For the component/components, either no data are currently available or the data are not sufficient for classification.

**Germ Cell Mutagenicity**

| Name | Route | Value |
|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | In vivo | Not mutagenic |

**Carcinogenicity**

For the component/components, either no data are currently available or the data are not sufficient for classification.

**Reproductive Toxicity**

**Reproductive and/or Developmental Effects**

| Name | Route | Value | Species | Test Result | Exposure Duration |
|---|---|---|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | Ingestion | Not classified for female reproduction | Rat | NOAEL 1,200 mg/kg/day | 1 generation |
| Perfluoro compounds (Primarily compounds with 9 carbons) | Ingestion | Not classified for male reproduction | Rat | NOAEL 1,200 mg/kg/day | 1 generation |
| Perfluoro compounds (Primarily compounds with 9 carbons) | Ingestion | Not classified for development | Multiple animal species | NOAEL 1,000 mg/kg/day | during gestation |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Ingestion | Not classified for female reproduction | Rat | NOAEL 1,288 mg/kg/day | premating & during gestation |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Ingestion | Not classified for male reproduction | Rat | NOAEL 1,288 mg/kg/day | 28 days |

| | | | | | |
|---|---|---|---|---|---|
| Perfluoro compounds (Primarily compounds with 12 carbons) | Ingestion | Not classified for development | Rat | NOAEL 1,288 mg/kg/day | during gestation |

**Target Organ(s)**

**Specific Target Organ Toxicity - single exposure**
For the component/components, either no data are currently available or the data are not sufficient for classification.

**Specific Target Organ Toxicity - repeated exposure**

| Name | Route | Target Organ(s) | Value | Species | Test Result | Exposure Duration |
|---|---|---|---|---|---|---|
| Perfluoro compounds (Primarily compounds with 9 carbons) | Ingestion | endocrine system \| gastrointestinal tract \| hematopoietic system \| liver \| immune system \| nervous system \| kidney and/or bladder \| respiratory system | Not classified | Rat | NOAEL 1,200 mg/kg/day | 13 weeks |
| Perfluoro compounds (Primarily compounds with 12 carbons) | Ingestion | endocrine system \| gastrointestinal tract \| hematopoietic system \| liver \| immune system \| nervous system \| kidney and/or bladder \| respiratory system | Not classified | Rat | NOAEL 1,545 mg/kg/day | 13 weeks |

**Aspiration Hazard**
For the component/components, either no data are currently available or the data are not sufficient for classification.

**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.

Prior to disposal, consult all applicable authorities and regulations to insure proper classification. Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include HF. Facility must be capable of handling halogenated materials. Empty and clean product containers may be disposed as non-hazardous waste. Consult your specific regulations and service providers to determine available options and requirements.

**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.

**EPCRA 311/312 Hazard Classifications:**

| **Physical Hazards** |
|---|
| Not applicable |

| **Health Hazards** |
|---|
| Not applicable |

### 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. All required components of this product are listed on the active portion of the TSCA Inventory.

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.

The NFPA Health code of 3 is due to emergency situations where the material may thermally decompose and release Hydrogen Fluoride and Perfluoroisobutylene (PFIB). During normal use conditions, please reference Section 2 and Section 11 of the SDS for additional health hazard information.

**HMIS Hazard Classification**

**Health:** 0 **Flammability:** 1 **Physical Hazard:** 0 **Personal Protection:** X - See PPE section.

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

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