Safety Data Sheet

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This Safety Data Sheet (SDS) is prepared in accordance with GB/T 16483 "Safety Data Sheet for Chemicals" regarding its content and item sequence, as well as with GB/T 17519 "Guidelines for the Preparation of Safety Data Sheets for Chemicals".

1 Product and Corporate Identity

1.1 Product Name

Chinese Name: 3M™ Fluorinert™ Electronic Liquid FC-3283 (Belgium)

English Name: 3M™ Fluorinert™ Electronic Liquid FC-3283 (Belgium)

identification of product

HB-0042-0654-4 ZF-0002-1344-5 ZF-0002-1345-2 ZF-0002-1356-9

1.2 Recommended Uses and Restricted Uses

Recommended Uses

For industrial use only; used as a test fluid or heat transfer fluid for electronic equipment. Not intended for use in medical devices or pharmaceuticals.

Restricted Use

Fluorinert™ electronic fluids have a broad range of applications, including but not limited to precise cleaning of medical devices and lubricant deposition solutions for medical devices.

When this product is used in devices implanted in the human body, there may be no residual fluorinated liquid solvent on the components. It is strongly recommended to reference the supporting test results and protocols during the FDA registration process. The 3M™ Electronic Market Materials Division (EMSD) does not intentionally combine its products with pharmaceutical products or applications (where 3M products are temporarily or permanently implanted in the human or animal body) for sampling, support, or sale of such products. Customers bear the responsibility to evaluate and determine whether 3M Electronic Market Materials Division products are suitable for their specific applications and intended uses. The conditions under which 3M products are evaluated, selected, and utilized vary significantly and impact the application and intended use of these products. Since many of these conditions are unique to the knowledge and control of the user, it is essential to evaluate 3M products to determine whether they are suitable for specific applications and intended uses, as well as whether they comply with local applicable laws, regulations, standards, and guidelines.

1.3 Supplier Information

supplier:	3M Belgium N.V./S.A.
product department:	Electronic Materials and Solutions Product Division
address:	Hermeslaan 7 B-1831 Diegem, Belgium
telephone:	021-22105335
Fax:	021-22105036
E-mail:	Tox.cn@mmm.com
URL:	www.3m.com.cn

1.4 Emergency Telephone

National Chemical Accident Emergency Consultation Hotline: 0532-83889090 (24/7)

2 Risk Overview

Emergency Overview

liquid ,

2.1 Classification of Substances and Mixtures

According to GB13690-2009, this product is not classified as a hazardous material.

2.2 Label Elements

Graph Notation

not applicable 。

figurative graph

not applicable

Warning Terms

not applicable 。

Precaution Instructions

【 preventive measure 】

No special requirements.

[Incident Response]

No special requirements.

【 safe storage 】

No special requirements.

[Waste Disposal]

No special requirements.

Physical and chemical hazards

No known GHS hazard classification is available; please refer to Chapter 9 or Chapter 10 for further information.

health hazard

environment hazards

No known GHS hazard classification is available; please refer to Chapter 12 for further information.

2.3 Other Hazards

unknown 。

3 Ingredients/Composition Information

This product is classified as a substance.

Ingredient	CAS Number:	% proportion by weight
C5-18-PFAlkane	86508-42-1	100

4 Emergency Treatment

4.1 Emergency Treatment

inhalation：
No emergency medical attention is expected. If symptoms worsen, move the patient to an area with fresh air and seek medical attention immediately.

skin exposure：
In the event of skin contact, wash the affected area with soap and water. If symptoms worsen, seek medical attention.

eye contact：
If exposed to the substance, rinse your eyes thoroughly with plenty of water. If possible, remove your contact lenses, then continue rinsing. If any symptoms or signs occur, seek medical attention immediately.

In case of ingestion:
Do not induce vomiting. Rinse your mouth. If you experience any discomfort, seek medical attention.

4.2 Important Symptoms and Effects, Including Acute and Delayed Manifestations.

No obvious symptoms or effects observed; refer to Section 11.1: Toxicological Information.

4.3 It Is Recommended to Protect Rescue Personnel and to Issue a Special Warning to Medical Professionals.

For information on the hazards to physical and health, respiratory protection, ventilation, and personal protective equipment, please refer to other sections of the SDS.

4.4 Timely Medical Care and Specific Treatment Instructions

not applicable

5 Fire Protection

5.1 Applicable Fire Extinguishing Agents

Use an appropriate fire extinguishing agent to extinguish the fire.

5.2 Special Hazards Arising from Substances or Mixtures

Contact with high temperatures may cause thermal decomposition. This product contains no inherent hazards.

Hazardous decomposition products or by-products

Matter	Condition
Carbon monoxide	During the combustion process
Carbon dioxide	During the combustion process

5.3 Special Protective Equipment for Firefighters

Wear the full set of protective gear, including a helmet, self-contained breathing apparatus (SCBA) or pressure-demand breathing apparatus, a protective cover garment and trousers, arm and waist protection, leg protection, a face shield, and a headgear.

Protective cover for exposed areas.

6 Leak Emergency Response

6.1 Protective Measures, Protective Equipment, and Emergency Response Procedures for Workers

Ventilate the workplace with fresh air. Follow the preventive measures outlined in other sections.

6.2 Environmental Protection Measures

Avoid release into the environment.

6.3 Methods for Containing and Decontaminating Leaked Chemicals, as Well as the Disposal Materials Used for This Purpose

Collect the spill into a container. Clean the spill from the edges inward, then cover it with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix the mixture until fully absorbed and dry. Note that adding an adsorbent does not eliminate physical, health, or environmental hazards. Collect as much of the spill as possible. Place the collected material in a sealed container approved by the relevant authorities for transportation. Clean the residue using an appropriate solvent selected by a professional. Ventilate the work area with fresh air. Read and follow the safety precautions outlined on the solvent label and the Material Safety Data Sheet (MSDS) when using this product. Seal the container. Dispose of the collected material in accordance with local, regional, national, or international regulations as soon as possible.

6.4 Preventive Measures for Secondary Disasters

not applicable 。

7 Handling, Disposal, and Storage

7.1 Safety Handling Precautions

Do not inhale thermal decomposition products. For industrial or professional use only; not for sale or use in the consumer market. Store separately from workwear, other clothing, food, and tobacco products. Avoid release into the environment. Smoking is prohibited: if this product is used during smoking, it may contaminate tobacco and/or smoke, leading to the formation of harmful decomposition products.

7.2 Conditions for Safe Storage, Including Restrictions on Incompatible Substances.

Keep away from heat sources and storage conditions.

8 Exposure Control/Personal Protective Equipment

8.1 Controlling Parameter

Occupational Exposure Limits

None of the components listed in Chapter 3 of this Safety Technical Manual have occupational exposure limits.

Biological Contact Limit

No known biological exposure limits are listed for any of the components specified in Chapter 3 of this Safety Data Sheet (SDS).

8.2 Contact Control

8.2.1 Engineering Control

When liquids may come into contact with extremely high temperatures due to improper operation or equipment failure, an appropriate and adequate local exhaust ventilation system should be employed to ensure that the concentration of thermal decomposition products remains below their exposure limits.

8.2.2 Personal Protective Equipment

Eye/Face Protection

non-essential 。

Skin/Hand Protection
Under normal operating conditions, chemical-resistant gloves are not required. However, when the product is exposed to extreme heat, hydrofluoric acid may be formed. In such cases, it is recommended to use chloroprene rubber gloves and a protective apron.

respiratory protection

When materials may come into contact with extremely high temperatures due to improper operation or equipment failure, use a positive-pressure supplied breathing apparatus.

9 Physical and Chemical Properties

9.1 Basic Physicochemical Properties

Physical condition	Liquid
Specific physical form:	Liquid
Pigment	Colorless
Smell	Odorlessness
Odor threshold	*Non-avaible*
pH price	*Not applicable*
Melting point/Freezing point	*Not applicable*
Boiling point / Initial boiling point / Boiling range	123 - 133 ℃
Flash point	No flash point
Evaporation rate	<1: No unit or not applicable. [*Reference standard:*Molar ratio = 1]
Flammability (solid, gas)	Not applicable
Combustion Limit Range (Lower Limit)	Not detected
Combustion Limit Range (Upper Limit)	Not detected
Vapour pressure	1,866.5 Pa [@ 23 ℃]
Steam density, steam relative density	18 *[@*23 °C] [*Reference standard:*Air = 1]
Density	1.8 g/ml
Relative density	1.8 *[Reference standard:*Water = 1]
Solubility – Water Solubility	0
Solubility – Non-water soluble	*Non-avaible*
N-hexanol/water partition coefficient	*Non-avaible*
Autogenous ignition temperature	*Non-avaible*
Decomposition temperature	*Not applicable*
Viscosity / Dynamic Viscosity	0.7 mm2/sec [@ 25 ℃]
Volatile organic compound	*[Detailed Information:*Exemption]
Percentage of volatile substances	100 %
Non-water VOC-free solvent	*[Detailed Information:*Exemption]
Formula weight	*Non-avaible*

10 Stability and Reactivity

10.1 Reactiveness
Under certain conditions, this raw material may react with certain reagents – see other sections in this chapter.

10.2 Chemical Stability

stabilize 。

10.3 Risk of Adverse Reactions

No harmful polymerization reactions will occur.

10.4 Conditions to Avoid

heat

10.5 Incompatible Substances

Fine active metal powders: alkali metals and alkaline earth metals

10.6 Hazardous Decomposition Products

matter	condition
hydrogen fluoride	When the temperature rises – above 200 °C
Perfluoroisobutylene	When the temperature increases – above 200°C

See Section 5.2 "Hazardous Combustion Decomposition Products".

If the product comes into contact with extremely high temperatures due to improper use or equipment failure, toxic decomposition products may be generated, including hydrogen fluoride and perfluoroisobutylene.

11 Toxicology Data

When a competent authority imposes mandatory classification requirements for certain specific components, it may occur that the potential health hazard information listed below differs from the substance classification results presented in Chapter 2. Additionally, toxicological data for certain components may not be reflected in the substance classification results and/or in the signs and symptoms that may manifest following exposure; this may be due to the fact that the concentration of such components is below the threshold requiring labeling, there is no possibility of exposure, or the toxicological data for the component is irrelevant to the final product as a whole.

11.1 Toxicology Information

Signs/Symptoms

Based on the test data and/or information regarding its components, this substance may cause the following health effects:

inhalation：
No known health hazards

skin exposure：
When using this product, skin contact will not cause any noticeable irritation.

eye contact：
Eye contact with the product will not cause any noticeable irritation.

ingestion：
No known health hazards

Toxicology data
If a component is disclosed in Chapter 3 but does not appear in the table below, it is because no available data exists or the available data is insufficient for classification.

acute toxicity

Name	Road	Species	Price
C5-18-PFAlkane	Skin	Professional Judgment	The estimated median lethal dose (LD_{50}) is> 5,000 mg/kg.
C5-18-PFAlkane	Inhalation–vapor (4 hr)	Rat	Half-Effective Concentration (LC_{50})> 120 mg/L
C5-18-PFAlkane	Ingestion	Rat	Half-ED50 (LD_{50})> 5,000 mg/kg

ATE = Acute Toxicity Estimate

Skin corrosion/irritation

Name	Species	Price
C5-18-PFAlkane	Rabbit	No significant stimulus

Severe ocular injury/Ocular irritation

Name	Species	Price
C5-18-PFAlkane	Rabbit	No significant stimulation

sensibility：

sensitization of skin
For this product composition, there are no known reference data, or the available data are insufficient for classification.

respiratory hypersensitivity
For this product composition, there are no known reference data, or the available data are insufficient for classification.

Germline mutagenicity
For this product composition, there are no known reference data, or the available data are insufficient for classification.

carcinogenicity
For this product composition, there are no known reference data, or the available data are insufficient for classification.

Reproductive toxicity

Reproductive and/or developmental effects:

Name	Road	Price	Species	Test result	Exposure time
C5-18-PFAlkane	Ingestion	Female reproductive effects: Unclassified	Rat	No side effects or adverse reactions observed. No Observed Adverse Effect Level (NOAEL): 1,000 mg/kg/day	During mating and pregnancy
C5-18-PFAlkane	Ingestion	Male reproductive effects: Unclassified	Rat	No side effects or adverse reactions observed. No Observed Adverse Effect Level (NOAEL): 1,000 mg/kg/day	28 sky
C5-18-PFAlkane	Ingestion	No developmental effects classification	Rat	No side effects or adverse reactions observed. No Observed Adverse Effect Level (NOAEL): 1,000 mg/kg/day	Period of gestation

critical organ

Specific target organ system toxicity – single exposure
For this product composition, there are no known reference data, or the available data are insufficient for classification.

Specific Target Organ System Toxicity – Repeated Exposure

Name	Road	Critical organ	Price	Species	Test result	Exposure time
C5-18-PFAlkane	Ingestion	Endocrine system | Gastrointestinal tract | Hematopoietic system | Liver | Immune system | Nervous system | Kidney and/or bladder | Respiratory system	NEC	Rat	No side effects or adverse reactions observed. No Observed Adverse Effect Level (NOAEL): 1,200 mg/kg/day	13 Zhou

Risk of chemical-induced pulmonary aspiration pneumonia
For this product composition, there are no known reference data, or the available data are insufficient for classification.

For additional toxicological information regarding this substance and/or its components, please contact the address or telephone number listed on the cover page of the Safety Data Sheet.

12 Ecological Data

If the competent authorities impose a mandatory classification on a specific component, the information provided below may differ from the substance classification outlined in Part 2. If necessary, additional information required for product classification may be provided. Furthermore, if the concentration of a particular component is below the threshold specified on the label, or if that component is unlikely to result in exposure, or if the data is irrelevant to the entire substance, this chapter may not include sections on environmental fate and environmental effects.

12.1 Toxicity

Acute aquatic hazard:
According to GHS classification, there is no acute toxicity to aquatic organisms.

Chronic aquatic hazards:
According to GHS classification, there is no chronic toxicity to aquatic organisms.

No product test data available

Material	CAS Number:	Organism	Type	Expose	Test endpoint	Test result
C5-18-PFAlkane	86508-42-1	Daphnia	Experimental article	48 hr	EC50	>100 mg/l
C5-18-PFAlkane	86508-42-1	Daphnia	Estimated value	21 sky	NOEC	>100 mg/l

12.2 Durability and Degradability

Material	CAS Number	Test Type	Duration	Research Type	Test result	Treaty Draft
C5-18-PFAlkane	86508-42-1	Current data are insufficient.	N/A	N/A	N/A	N/A

12.3 Potential Bioaccumulation

Material	CAS Number	Test Type	Duration	Research Type	Test result	Treaty Draft
C5-18-PFAlkane	86508-42-1	No data available or insufficient data to perform classification.	N/A	N/A	N/A	N/A

		Class 。				

12.4 Migratory Properties of Soil

For more detailed information, please contact the manufacturer.

12.5 Other Adverse Effects

non-avaible

13 Waste Disposal

13.1 Disposal Method

The disposal of this product/container shall comply with applicable local, regional, national, or international regulations.

Prior to disposal, consult all applicable regulatory authorities and review relevant regulations to ensure proper classification. Discharge the waste at a licensed industrial waste disposal facility. As one of the available waste disposal methods, incinerate the waste at a licensed waste incineration plant. The correct destruction method may involve the use of additional fuel during the incineration process. The incineration products include HF. The equipment must be capable of handling halogenated materials. Empty and clean product containers may be disposed of as non-hazardous waste. Please consult specific regulations and service providers to determine the available options and requirements.

14 Transportation Information

local statues
Classified as non-hazardous goods for transportation purposes.

China Hazardous Transport Classification: Not applicable

International Regulations
Classified as non-hazardous goods for transportation purposes.

UN Number: Not applicable
Correct transport terminology for the United Nations: Not applicable
Transport Classification (IMO): Not applicable
Transport Classification (IATA): Not applicable
Packaging category: Not applicable
environment hazards：

Marine pollutants: No

Special Precautions for Users
not applicable 。

15 Regulatory Information

Specific safety, health, and environmental laws and regulations applicable to this substance or mixture

Administrative Measures for the Environmental Management of New Chemical Substances (Ministry of Ecology and Environment Order No.12)
This product complies with China's new substance and environmental management regulations, as all its components are either listed or exempted from the existing list of chemical substances.

Regulations on the Safety Management of Hazardous Chemicals (2015 Edition)
List of Hazardous Chemicals (2015 Edition): No components listed.

GB18218-2018: Identification of Major Hazard Sources for Hazardous Chemicals
No ingredients listed

Regulations on Labor Protection at Workplaces Where Toxic Substances are Used (State Council Order No.352,2002)
List of Highly Toxic Substances: No components listed.

This Safety Data Sheet complies with the following national standards: GB/T 17519-2013 – Guidelines for the Preparation of Chemical Safety Data Sheets; GB 15258-2009 – Regulations on the Preparation of Chemical Safety Labels; GB 30000.2-2013–GB 30000.29-2013 – Specifications for the Classification and Labeling of Chemicals; GBZ/T 210.1-2008 – Guidelines for the Formulation of Occupational Health Standards – Part 1: Occupational Exposure Limits for Chemical Substances at Workplaces; GBZ/T 210.2-2008 – Guidelines for the Formulation of Occupational Health Standards – Part 2: Occupational Exposure Limits for Dust at Workplaces; GBZ/T 210.3-2008 – Guidelines for the Formulation of Occupational Health Standards – Part 3: Occupational Exposure Limits for Physical Factors at Workplaces; GB 6944-2012 – Classification and Nomenclature of Dangerous Goods; GB/T 15098-2008 – Method for Classifying Transport Packaging for Dangerous Goods; and GB 12268-2012 – List of Dangerous Goods.

For further information, please contact the manufacturer listed in Chapter 1 of this Safety Data Sheet.

16 Other Information

consult
"Recommendations of the United Nations on the Transport of Dangerous Goods – Model Regulations"
United Nations*"Global Harmonized System for the Classification and Labeling of Chemicals"*(GHS)

Revision Information:
Updates have been made to certain sections of the SDS. Please review the information in the SDS again.

Disclaimer: The information contained in this Safety Data Sheet (SDS) is based solely on our experience and is derived from our existing data as of the date of publication, as well as from the most appropriate usage method we consider for this product under normal conditions. However, we shall not be liable for any losses, damages, or injuries arising from the use of this product (unless otherwise specified by law). This information does not apply in the following circumstances: where the user fails to follow the instructions in this SDS when using the product, or mixes this product with other materials. Therefore, it is important that customers independently evaluate whether the product is suitable for their intended application. Additionally, the provision of this SDS is intended to convey health and safety information. If you are an importer of this product in China, you must comply with all applicable regulatory requirements, including but not limited to product registration/filing, tracking of substance authorization limits, and potential substance registration/notification obligations.

The 3M China SDS can be found at www.3m.com.cn.