SECTION 1: Identification

Product Identifier

Tradename **TC-7100**
CAS Number 163702-08-7

Recommended use of the chemical and restrictions on use

Industrial use only. Solvent for cleaning and coating, heat transfer fluid.

Restrictions on Use

TC-7100 are used in a wide range of applications, including but not limited to cleaning of medical devices and as a lubricant deposition solvent for medical devices. When the product is used for applications where the finished product is implanted into the human body, no residual product may remain on the parts.

Tyrell Chemical will not knowingly sample, supply or sell its products for incorporation into medical and pharmaceutical products and applications where the product will be temporarily or permanently implanted into humans or animals. The customer is responsible for evaluating that a product is suitable and appropriate for its particular use or intended application. It Is essential that the user evaluate and determine whether the product is suitable and appropriate for a particular use and intended application, and complies with all local applicable laws, regulations, standards, and guidance.

Details of the suppler of the safety data sheet

Supplier Tyrell Chemical LLC
1 Alhambra Plaza PH Floor
Coral Gables FL 33134
Phone Number: +1-786-633-0019

Emergency Telephone Number

Emergency Telephone Number +1-786-633-0019
Reference Number TM HTN-100

SECTION 2: Hazard(s) Identification

Classification of the substance or mixture

Classifications according to OSHA Hazard Communication Standard (29 CFR 1910.1200)

GHS07

Skin Irrit. 2A	H315	*Causes Skin Irritation*
Eye Irrit. 2A	H319	*Causes Serious Eye Irritation*
STOT SE 3	H335	*May Cause Respiratory Irritation*
Aquatic Chronic 4	H413	*May cause long lasting harmful effects to aquatic life*

Information concerning particular hazards for human and environment

The product has to be labelled due to the calculation procedure of OSHA Hazard Communication Standard (20 CFR 1910.1200).

Classification system

The classification is according to the latest edition of OSHA Hazard Communication Standard (29 CFR 1910.1200), and extended by company and literature data.

- Label Elements
- Labelling according to OSHA Hazard Communication Standard (29 CFR 1910.1200)
- Hazard Pictograms

Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US)

GHS07

Signal word *Warning*

Hazard-determining components of labelling

Methyl perfluoroisobutyl ether

Hazard Statements (GHS-US)

H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H413	May cause long lasting harmful effects to aquatic life

Precautionary statements (GHS-US)

P202	Do not operate until you have read and understood all safety precautions.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves / eye protection / face protection.
P302+P352	If on skin: Wash with plenty of water.
P304+P340	**IF INHALED:** Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	**If in eyes:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312	Call a poison center or doctor if you feel unwell.
P321	Specific treatment (see supplemental first aid instructions on this label).
P362+P364	Take off contaminated clothing and wash it before reuse.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P337+P313	If eye irritation persists: Get medical advice/attention.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container in an approved waste disposal plant

Hazards not otherwise classified (HNOC) *No further relevant information available.*

Unknown acute toxicity (GHS US) *Not applicable*

SECTION 3: Composition/information on ingredients

Substance

Methyl perfluoroisobutyl ether

CAS No.	Description	%
163702-08-7	Methyl perfluoroisobutyl ether	100%

SECTION 4: First-aid measures

Description of first aid measures

General description

Immediately remove any clothing soiled by the product. In case of accident or if you feel unwell, seek medical advice immediately. Show this Safety Data Sheet to the medical personnel. Move the affected person from the contaminated area.

After Inhalation

No specific recommendations. If throat irritation or coughing persists, proceed as follows. Move affected person to fresh air and keep at rest in a position comfortable for breathing. Loosen tight clothing such as collar, tie or belt. Get medical advice/ attention if discomfort continues. If not breathing give artificial respiration. In case of unconsciousness place patient on side for transportation. There may be irritation of the throat with a feeling of tightness in the chest. Exposure may cause coughing or wheezing.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Get medical advice/attention. There may be irritation and redness at the site of contact.

After eye contact

Immediately flush eyes thoroughly with water. Remove contact lenses, if present and easy to do so. Continue rinsing. Get medical advice/attention if discomfort continues. There may be irritation and redness. The eyes may water profously

After ingestion

No specific recommendation. If throat irritation of coughing persists proceed as follows. Rinse mouth out with water. Get medical advice / attention if any discomfort continues. There may be soreness and redness of the mouth and throat.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2)

Indication of any immediate medical attention and special treatment needed

Treat symptomatically

SECTION 5: Fire-fighting measures

Extinguishing Media

Suitable extinguishing agents The product is nonflammable. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog. Use firefighting measures that suit the environment.

Special hazards arising from the substance or mixture

Fire hazard	Thermal decomposition generates: Carbon oxides, hydrogen fluoride
Explosion hazard	Risk of explosion if heated under confinement due to excessive pressure buildup. Use water spray or fog for cooling exposed containers

Special protective equipment and precautions for firefighters

Firefighting instructions Avoid breathing fire gases or vapors. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. If a leak or spill has not ignored use water spray to disperse vapors and protect personnel stopping the leak.

Protective equipment Wear gas tight chemically protective clothing in combination with self-contained breathing apparatus (SCBA) and appropriate clothing including helmets, protective boots, and gloves will provide a basic level of protection of chemical incidents. For further information refer to section 8: exposure controls/personal protection.

SECTION 6: Accidental Release Measures

Personal Precautions, protective equipment and emergency procedures

General Measures Keep away from sparks, flames, and extreme heat. Evacuate unnecessary personnel. Ensure adequate air ventilation. Do not breathe gas, fumes, vapor, or spray. If outside do not approach from downwind. Mark the contaminated area with signs and prevent access to unauthorized personnel. Turn leaking containers leak-side up to prevent the escape of liquid

For non-emergency personnel

Emergency procedures Prevent further leakage or spilling if safe to do so.

For Emergency Responders

Protective Equipment Do not attempt to take action without suitable equipment. For further information refer to section 8 "Exposure controls/personal protection"

Emergency Procedures

Environmental Precautions

Do not allow to enter sewers / surface or ground water. Notify authorities if product enters sewers or public waters. Avoid release into the environment

Methods and material for containment and cleaning up

For containment Stop leak if safe to do so. Dike up recovery or absorb with appropriate material.

Methods for cleaning up Collect the spillage in the container. Clean up from the edge of the spill inward. Cover with bentonite, vermiculite, or commercially available non-polar absorbent material. After fully absorbed mix until dry. Collect as much spillage as possible.

Other information Dispose contaminated material as waste according to section 13.
Ensure adequate ventilation

SECTION 7: Handling and Storage

Precautions for safe handling

Do not breathe thermal decomposition products. For industrial use only. Not for consumer sale or use. Store work clothes separately from other clothing, food and tobacco products. Do not eat, drink, or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (e.g. 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. Keep away from sparks, flames, and extreme heat.

Handle all packages and containers carefully to minimize spills. Keep container tightly sealed when not in use.
Avoid the formation of mists.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
For the general occupational hygienic measures refer to Section 8.

Conditions for safe storage, including any incompatibilities

Store away from acids. Store away from strong bases. Store away from oxidizing agents. Avoid exposure to the sun.

Conditions for safe storage, including any incompatibilities

Requirements to be met by storerooms and receptacles No special requirements.
Information about storage in one common storage facility Not required.
Further information about storage conditions Keep receptacle tightly sealed. Store in a cool dry place

SECTION 8: Exposure controls/personal protection

Exposure Controls

Based on the composition shown in section 3, the following measures are suggested for occupational safety measure.

Occupational exposure limits

Ingredient	CAS Number	Limit type
Methyl perfluoroisobutyl ether	163702-08-7	750 ppm

Appropriate engineering controls

Where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust sufficient to maintain levels of thermal decomposition products below their exposure guidelines.

Ensure good ventilation of the workstation to ensure
Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use general dilution 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. Provide ventilation adequate to maintain vapor concentration below lower explosive concentration.

Keep away from foodstuffs, beverages, tobacco, and feed stuffs.
Immediately remove all soiled and contaminated clothing.
Avoid contact with eyes and skin.
See Section 7 for information about the design of technical facilities.

Personal protective equipment

Hand Protection

Protective gloves 29 CFR 1910.138 Hand Protection.
Gloves made from the following material(s) are recommended: Neoprene

Skin Protection

If this product is used in a manner that presents a higher potential for exposure (e.g. spraying, high splash potential, etc) then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following clothing material(s) are recommended: Apron – Neoprene.

Eye protection

Chemical goggles or safety glasses. Face shield. 29 CFR 1910.133: Eye and face protection

Hygiene Measures

Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking, or using the toilet. Do not eat, drink, or smoke when using this product.

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.

Provide adequate ventilation. Large spills: If ventilation is inadequate, suitable respiratory protection must be worn. In case of inadequate ventilation wear respiratory protection. In case of intensive or longer exposure use respiratory device that is independent of circulating air.

Skin and body protection

Wear suitable protective clothing

Other information

Safety Shoes 29 CFR 1910.136: Foot Protection

SECTION 9: Physical and Chemical Properties

General information

Appearance	
Form	Liquid
Color	Colorless
Odor	Slight ether
Odor Threshold	No data available
pH	No data available

Change in condition

Melting Point / Freezing Point	-135 °C (211 °F)
Initial boiling point and boiling range	59 °C (138.2 °F)
Minimum operating temperature	-105 °C (-157 °F)
Maximum operating temperature	50 °C (122 °F)
Flash point:	No Flash Point
Flammability Limits (LEL)	no data
Flammability Limits (UEL)	no data
Auto-ignition temperature	405 °C
Decomposition temperature	No data available
Explosion limits	
Lower	No data available
Upper	No data available
Vapor pressure	109 mmHg (@ 25 °C)
Density	1.51 g/cm3
Thermal Conductivity	0.0644 W/m/k
Dielectric Strength	> 28.1 kV (2.5mm)
Dielectric Constant	8.98 (1 Mhz)
Surface Tension	13.72 mN/m
Relative Density	No data available
Vapor Pressure	No data available
Solubility in / miscibility with water	No data available
Partition coefficient (n-octanol/water)	Not available
Viscosity	0.5005 mm2·s-1
Percent volatile	100%
Other information	No further relevant information available.

Section 10: Stability and reactivity

Reactivity	This material is considered to be non-reactive under normal use.
Stability	Stable at normal ambient temperature and when used as recommended. Stable under the prescribed storage conditions.
Possibility of hazardous reactions	Hazardous polymerization will not occur.
Conditions to avoid	Extremely high temperatures, keep away from heat, sparks, flame
Materials to avoid	Strong acids Strong bases Strong oxidizing agents
Hazardous decomposition	Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Carbon monoxide, carbon dioxide, hydrogen fluoride, toxic vapor, gas, particulate

SECTION 11: Toxicological Information

Acute toxicity

LD/LC50 values that are relevant for classification
Acute dermal toxicity, LD50 estimated to be > 5000 mg/kg
Acute inhalation toxicity, no lethal doce, LC50 > 20477.8 mg/m^3
Acute imported toxicity, LD50 > 5000 mg/kg

Skin corrosion/irritation	No significant irritation to rabbit skin
Serious eye damage/irritation	No significant irritation to rabbit eyes
Respiratory or skin sensitization	No reference data
Germ Cell Mutageniticity	Not mutagenic
Target Organs	No specific target organs known
Aspiration Hazard	No classified

Additional toxicological information
Carcinogenic categories
IARC (International Agency for Research on Cancer)
Substance is not listed
NTP (National Toxicology Program)
Substance is not listed
OSHA-CA (occupational safety and Health administration)
Substance is not listed

General Information No specific health hazards known. The severity of the symptoms described will vary dependent on the concentration and the length of exposure

SECTION 12: Ecological Information

Toxicity

Aquatic toxicity	No further relevant information available.
Persistence and degradability	No further relevant information available.
Bio accumulative potential	No further relevant information available.
Mobility in soil	No further relevant information available.
Other adverse effects	No further relevant information available.
Ecotoxicity	Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.

SECION 13: Disposal Considerations

Waste treatment methods

General Information
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way. Must not be disposed of together with household garbage. Do not allow product to reach sewage system. Remove to an authorized incinerator equipped with an afterburner and glue gas scrubber. Combustion products will include HF. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

Uncleaned packages

Recommendation
Disposal must be made according to official regulations. Dispose of surplus product and those that cannot be recycled via a licensed waste disposal contractor. Waste packaging should be collected for reuse or recycling. Incineration should only be considered when recycling is not feasible and must be equipped with a system for the neutralization or recovery of HF. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of the local water authority.

SECION 14: Transport Information

General The product is not covered by international regulations on the transport of dangerous goods (IDMG, IATA, DOT). DO NOT MIX AND TRANSPORT WITH STRONG ACIDS, STRONG BASES, AND FOOD. During transportation ensure that the container does not leak, collapse, fall, be damaged, be inverted or shaken violently. Avoid exposure to the sunlight, rain, and high temperatures during transportation. Stay away from fire and high temperature areas during stopovers. Transport vehicles should be equipped with corresponding types and quantities of fire-fighting equipment and leakage emergency treatment equipment.

UN-Number
DOT, IDMG, IATA Not applicable

UN proper shipping name Not applicable
DOT, IDMG, IATA

Transport Hazard class(es) Not applicable
Class

Label -

Packaging Group
DOT, IDMG, IATA Not applicable

Environmental hazards
Marine Pollutant No

Special precautions for user Not applicable

Transportation in bulk according to Annex II of MARPOL73/78 and the IBC code: Not applicable

UN "Model Regulation" Not applicable

SECION 15: Regulatory information

US Federal Regulations

TSCA (Toxic Substances Control Act)
Listed on the United States TSCA inventory

All components of this product are listed, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TCSA) inventory

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR 372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372

International Regulations

CANADA

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National Regulations

Listed on AICS (Australian Inventory of Chemical Substances)
Listed on the IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on the NZIoC (New Zealand Inventory of Chemicals)
Listed on the PICCS (Philippines Inventory of Chemicals and Chemical Substances)

US State Regulations

California Proposition 65 Carcinogens and Reproductive Toxins	
Chemicals known to cause cancer	Substance is not listed
Chemicals known to cause reproductive toxicity for females	Substance is not listed
Chemicals known to cause reproductive toxicity for males	Substance is not listed
Chemicals known to cause developmental toxicity	Substance is not listed
Massachusetts Right-To-Know List	Substance is not listed
Minnesota Right-To-Know List	Substance is not listed
New Jersey Right-To-Know List:	Substance is not listed
New Jersey Special Hazardous Substance List	Substance is not listed
Pennsylvania Right-To-Know List	Substance is not listed
Pennsylvania Special Hazardous Substance List	Substance is not listed
Rhode Island Right to Know list	Substance is not listed
Cancerogenity Categories	
EPA (Environmental Protection Agency)	Substance is not listed
TLV (Threshold Limit Value established by ACGIH)	Substance is not listed
NIOSH-ca (National Institute for Occupational Safety and Health)	Substance is not listed

SECTION 16: Other Information:

The contents and format of this SDS are in accordance with 29 CFR 1910.1200

Training Advice	Only trained personnel should use this material
Issued by	Tyrell Chemical LLC
Date of Preparation / last revision	2023-03-28
Supersedes Date	2022-09-13
Revision	3
SDS status	Approved

NFPA Health Hazard	3 – Short exposure could cause temporary or residual injury even though prompt medical attention was given
NFPA Fire Hazard	1 – Materials that are normally stable but become explosive at elevated temperature and pressure.
NFPA Reactivity	0 – Normally stable even under fire exposure conditions and are not reactive with water

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

HMIS III Rating	
Health	1 slight hazard – This material causes irritation nor minor, reversable injury on contact with eyes, skin, mucous membranes or upper respiratory tract.
Flammability	1 slight hazard – material must be preheated before ignition will occur.
Physical	0 Minimal Hazard – Materials that are normally stable, even under fire conditions, and will NOT reach with water, polymerize, decompose, condense, or self-react. Non-Explosives

Abbreviations and acronyms:

ACGIH:	American Conference of Governmental Industrial Hygienists
AICS:	Australian Inventory of Chemical Substances
CAS:	Chemical Abstracts Services (Division of the American Chemical Society)
CERCLA:	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
DOT:	US Department of Transportation
DSL	Domestic Substances List
ECL:	Existing Chemicals List
EPA:	Environmental Protection Agency
Eye Irrit. 2a:	Serious Eye damage/eye irritation – Category 2A
IECSC:	Inventory of Existing Chemical Substances Produced or Imported in China
IMDG:	International Maritime Code for Dangerous Goods
IATA:	International Air Transport Association
LC50:	Lethal Concentration, 50 percent
LD50:	Lethal Dose, 50 percent
NIOSH:	National Institute for Occupational Safety
NZIoC:	New Zealand Inventory of Chemicals
OSHA:	Occupational Safety and Health
PICCS:	Philippines Inventory of Chemicals and Chemical Substances
SARA:	Superfund Amendments and Reauthorization Act
Skin Irrit. 2:	Skin corrosion/irritation – Category 2
STOT SE 3:	Specific target organ toxicity (single exposure) – Category 3
TLV:	Threshold Limit Value

DISCLAIMER OF LIABILITY

The information in this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and may be beyond our knowledge. For this and for other reasons we do not assume and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use, or disposal of the product. This SDS was prepared and is to be used only for this product. If the product is used as a component in another product then this SDS information may not be applicable. The above information is believed to be correct and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is offered solely for your consideration, investigation, and verification. It does not represent any guarantee of the properties of the product nor that the hazard precautions or procedures described are the only ones that exist. Tyrell Chemical LLC shall not be held liable for any damage resulting from handling or from contact with the above product

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END OF DOCUMENT