

Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the SS586 Specification for Hazard Communication for Hazardous Chemicals and Dangerous Goods.

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SECTION 1: Identification

1.1. Product identifier

3M Novec 7500 Engineered Fluid

Product Identification	n Numbers		
98-0212-2928-5	98-0212-2929-3	98-0212-2932-7	

1.2. Recommended use and restrictions on use

Recommended use

Heat transfer fluid. For industrial use only. Not intended for use as a medical device or drug., Industrial use.

Restrictions on use

Novec[™] Engineered Fluids 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.

98-0212-3465-7

1.3. Supplier's details

Address:3M Technologies (S) Pte Ltd,10 Ang Mo Kio Street 65, Singapore 569059Telephone:+65 6450 8888Website:www.3m.com.sg

1.4. Emergency telephone number

+65 6591 6601 (8.15am - 5.00pm, Monday - Friday)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

This product is not classified as hazardous per GHS criteria as implemented by Singapore Standard SS586: 2022.

2.2. Label elements SIGNAL WORD Not applicable.

Symbols Not applicable

Pictograms

Not applicable

2.3. Other hazards

In use, may form flammable/explosive vapour-air mixture.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	CAS Nbr	% by Wt
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	297730-93-9	> 99
dodecafluoro-2-(trifluoromethyl)-hexane		

SECTION 4	• First aid	measures
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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 Nat applicable

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. No closed-cup flash point but flam/expl. vapor air mixture Material displays no closed-cup flash point but may form flammable/explosive vapor air mixture.

Hazardous Decomposition or By-Products

<u>Substance</u>	
Carbon monoxide.	
Carbon dioxide.	
Hydrogen Fluoride	

Condition

During combustion. During combustion. 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

Keep away from sparks/flames/extreme heat Keep away from sparks, flames, and extreme heat. 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 dykes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up

Eliminate ignition sources when cleaning spill Eliminate all potential ignition sources when cleaning up spill. 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 authorised person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and Safety Data Sheet. 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

Avoid inhalation of thermal decomposition products. Store work clothes separately from other clothing, food and tobacco products. Avoid release to the environment. 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/extreme heat Keep away from sparks, flames, and extreme heat.

7.2. Conditions for safe storage including any incompatibilities

Store away from strong bases.

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.

Ingredient	CAS Nbr	Agency	Limit type	Additional comments
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	297730-93-	Manufacturer	TWA:100 ppm	
dodecafluoro-2-(trifluoromethyl)-	9	determined		
hexane				

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

CMRG : Chemical Manufacturer's Recommended Guidelines

Singapore PELs : Singapore. Workplace Safety and Health (Permissible Exposure Levels of Toxic Substances) Order

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

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. Provide ventilation adequate to maintain vapor concentration below lower explosive concentration.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

None required.

Skin/hand protection

No chemical protective gloves are required.

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

Physical state	Liquid.	
Specific Physical Form:	Liquid.	
Color	Colorless	
Odor	Odorless	
Odour threshold	No data available.	
рН	Not applicable.	
Melting point/Freezing point	-100 °C	
Boiling point/Initial boiling point/Boiling range	129 °C	
Flash point	No flash point	
Evaporation rate	No data available.	
Flammability	Not applicable.	
Flammable Limits(LEL)	1.8 % volume [Details:EN 1839 Method at 144 °C]	
Flammable Limits(UEL)	15 % volume [Details:EN 1839 Method at 144 °C]	
Vapour pressure	2.1 kPa [@ 25 °C]	
Vapor Density and/or Relative Vapor Density	\pm 14.3 Units not available or not applicable. [<i>Ref Std</i> :AIR=1]	
Density	1.63 g/ml [@ 20 °C]	
Relative density	1.63 [<i>Ref Std</i> :WATER=1]	
Water solubility	0.0213 ppm [@ 23 °C]	
Solubility- non-water	No data available.	
Partition coefficient: n-octanol/water	5.75	
Autoignition temperature	330 °C	
Decomposition temperature	No data available.	
Kinematic Viscosity	0.77 mm ² /sec	
Percent volatile	100 %	
Molecular weight	No data available.	

Particle Characteristics

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 polymerisation will not occur.

10.4 Conditions to avoid Sparks and/or flames.

10.5 Incompatible materials

Strong bases.

10.6 Hazardous	decomposition	products
<u>Substance</u>		

Substance		
Hydrogen Fluoride	At elevated temperatures	extreme conditions of
	heat	
Perfluoroisobutylene (PFIB).	At elevated temperatures	extreme conditions of
	heat	
Toxic vapour, gas, particulate.	At elevated temperatures	extreme conditions of
	heat	

Refer to section 5.2 for hazardous decomposition products during combustion.

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

Condition

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 labelling, 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
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-	Dermal	Rat	LD50 > 2,000 mg/kg
(trifluoromethyl)-hexane			
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-	Inhalation-	Rat	LC50 > 50 mg/l
(trifluoromethyl)-hexane	Vapor (4		
	hours)		
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-	Ingestion	Rat	LD50 > 2,000 mg/kg
(trifluoromethyl)-hexane			

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-hexane	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-hexane	Rabbit	No significant irritation

Sensitization:

Skin Sensitisation

Name	Species	Value
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-hexane	Guinea pig	Not classified

Respiratory Sensitisation

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

Germ Cell Mutagenicity

Name	Route	Value
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-(trifluoromethyl)-hexane	In Vitro	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
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	Ingestion	Not classified for female reproduction	Rat	NOAEL	premating &
dodecafluoro-2-(trifluoromethyl)-hexane	-			1,000	during
				mg/kg/day	gestation
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	Ingestion	Not classified for male reproduction	Rat	NOAEL	premating &
dodecafluoro-2-(trifluoromethyl)-hexane	-			1,000	during
				mg/kg/day	gestation
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	Ingestion	Not classified for development	Rat	NOAEL	premating &
dodecafluoro-2-(trifluoromethyl)-hexane	-	*		1,000	during
				mg/kg/day	gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6,6,6- dodecafluoro-2- (trifluoromethyl)-hexane	Inhalation	respiratory irritation	Not classified	Rat	NOAEL 207 mg/l	5 days

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure
						Duration
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6,6,6- dodecafluoro-2- (trifluoromethyl)-hexane	Inhalation	liver kidney and/or bladder	Not classified	Rat	NOAEL 169 mg/l	5 days
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6,6,6- dodecafluoro-2- (trifluoromethyl)-hexane	Ingestion	liver heart endocrine system hematopoietic system immune system nervous system kidney and/or bladder	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days

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

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. Additional information leading to material classification in Section 2 is available upon request. In addition, environmental fate and effects data on ingredients may not be reflected in this section because an ingredient is present below the threshold for labelling, an ingredient is not expected to be available for exposure, or the data is considered not relevant to the material as a whole.

12.1. Toxicity

Acute aquatic hazard:

Not acutely toxic to aquatic life by GHS criteria. Aquatic Toxicity classification is based on HFE-7500 LC50 (fish) data > 100 mg/L, Log Pow > 4 and PFBA, (ultimate degradation product): Fish 96hr EC50 > 4149 mg/L, Daphnia 48 hr EC50 3475 mg/L, Algae 96 hr EC50 (growth rate) >/= 500 mg/L, 28 days BOD 1% (OECD 301D)

Chronic aquatic hazard:

GHS Chronic 4: May cause long lasting harmful effects to aquatic organisms.

No product test data available.

Material	CAS Nbr	Organism	Туре	Exposure	Test endpoint	Test result
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6, 6,6-dodecafluoro- 2-(trifluoromethyl)- hexane	297730-93-9	Medaka	Experimental	96 hours	No tox obs at lmt of water sol	>100 mg/l
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6, 6,6-dodecafluoro- 2-(trifluoromethyl)- hexane	297730-93-9	Activated sludge	Experimental	30 minutes	NOEC	>100 mg/l

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6, 6,6-dodecafluoro- 2-(trifluoromethyl)- hexane	297730-93-9	Experimental Biodegradation	28 days	BOD	1 %BOD/ThOD	OECD 301D - Closed bottle test
3-Ethoxy- 1,1,1,2,3,4,4,5,5,6, 6,6-dodecafluoro- 2-(trifluoromethyl)- hexane	297730-93-9	Experimental Photolysis		Photolytic half-life (in air)	1.5 years (t 1/2)	

12.3 : Bioaccumulative potential

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
3-Ethoxy-	297730-93-9	Experimental		Log Kow	6	830.7550 Part.Coef Shake
1,1,1,2,3,4,4,5,5,6,		Bioconcentration		-		Flask
6,6-dodecafluoro-						
2-(trifluoromethyl)-						
hexane						

12.4. Mobility in soil

Please contact manufacturer for more details

12.5 Other adverse effects

Material	CAS Nbr	Ozone Depletion Potential	Global Warming Potential
3-Ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-	297730-93-9		100
dodecafluoro-2-(trifluoromethyl)-			
hexane			

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. 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 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.

SECTION 14: Transport Information

International Regulations

UN No.: Not restricted for transport. UN Proper shipping name: Not restricted for transport.

Transportation Class (IMO): None assigned Transportation Class (IATA): None assigned Other Dangerous Goods Descriptions (IMO):None assignedOther Dangerous Goods Descriptions (IATA):None assignedPacking Group:None assignedMarine pollutant:None assigned

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Global inventory status

Contact 3M for more information. The components of this material are in compliance with the provisions of the Korea Chemical Control Act. Certain restrictions may apply. Contact the selling division for additional information. This product complies with Measures on Environmental Management of New Chemical Substances. All ingredients are listed on or exempt from on China IECSC inventory. 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.

This product may contain component(s) that are regulated by the following:

Workplace Safety and Health Act & Workplace Safety and Health (General Provisions) Regulations: this product is subject to SDS, labelling, PEL and other requirements in the Act/Regulations.

Fire Safety (Petroleum and Flammable Materials) Regulations: This product is subject to the requirements in the Regulations Sewerage & Drainage Act and Sewerage and Drainage (Trade Effluent) Regulations: This product is subject to the requirements in the act/regulation.

SECTION 16: Other information

DISCLAIMER: The information on this Safety Data Sheet is based on our experience and is correct to the best of our knowledge at the date of publication, but we do not accept any liability for any loss, damage or injury resulting from its use (except as required by law). The information may not be valid for any use not referred to in this Data Sheet or use of the product in combination with other materials. For these reasons, it is important that customers carry out their own test to satisfy themselves as to the suitability of the product for their own intended applications.

3M Singapore SDSs are available at www.3m.com.sg