



## Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

3M™ Novec™ 73DE Engineered Fluid

##### Product Identification Numbers

98-0212-4901-0	98-0212-4902-8	98-0212-4903-6
7100095234	7100095233	7100095235

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

##### Identified uses

For Industrial Use Only. See Limitations on Use for supplemental information on intended applications including Medical Device applications.

##### 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. 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. Details of the supplier of the safety data sheet

**Address:** 3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.  
**Telephone:** +44 (0)1344 858 000  
**E Mail:** tox.uk@mmm.com  
**Website:** www.3M.com/uk

**1.4. Emergency telephone number**

+44 (0)1344 858 000

**SECTION 2: Hazard identification****2.1. Classification of the substance or mixture****CLP REGULATION (EC) No 1272/2008**

The health and environmental classifications of this material have been derived using the calculation method, except in cases where test data are available or the physical form impacts classification. Classification(s) based on test data or physical form are noted below, if applicable.

This material has been tested for acute inhalation toxicity and the test results do not meet the criteria for classification.

**CLASSIFICATION:**

Serious Eye Damage/Eye Irritation, Category 2 - Eye Irrit. 2; H319

Specific Target Organ Toxicity-Single Exposure, Category 3 - STOT SE 3; H336

Hazardous to the Aquatic Environment (Chronic), Category 3 - Aquatic Chronic 3; H412

For full text of H phrases, see Section 16.

**2.2. Label elements****CLP REGULATION (EC) No 1272/2008****SIGNAL WORD**

WARNING.

**Symbols**

GHS07 (Exclamation mark) |

**Pictograms****Ingredients:**

Ingredient	CAS Nbr	EC No.	% by Wt
trans-dichloroethylene	156-60-5	205-860-2	60 - 90

**HAZARD STATEMENTS:**

H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

**PRECAUTIONARY STATEMENTS****Prevention:**

P261A	Avoid breathing vapours.
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**Response:**

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if
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present and easy to do. Continue rinsing.

## SUPPLEMENTAL INFORMATION:

### Supplemental Hazard Statements:

EUH018

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

### Supplemental Precautionary Statements:

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

## 2.3. Other hazards

None known.

This material does not contain any substances that are assessed to be a PBT or vPvB

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Ingredient	Identifier(s)	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
trans-dichloroethylene	(CAS-No.) 156-60-5 (EC-No.) 205-860-2 (REACH-No.) 01-2120093504-55	60 - 90	Flam. Liq. 2, H225 Acute Tox. 4, H332 Aquatic Chronic 3, H412 Nota C Eye Irrit. 2, H319 STOT SE 3, H336
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	(CAS-No.) 132182-92-4 (EC-No.) ELINCS 459-520-5 (REACH-No.) 01-0000019452-72	10 - 40	Substance with a national occupational exposure limit

Please see section 16 for the full text of any H statements referred to in this section

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS

## 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

Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

**If swallowed**

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

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

The most important symptoms and effects based on the CLP classification include:

Serious irritation to the eyes (significant redness, swelling, pain, tearing, and impaired vision). Central nervous system depression (headache, dizziness, drowsiness, incoordination, nausea, slurred speech, giddiness, and unconsciousness).

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

Not applicable

**SECTION 5: Fire-fighting measures****5.1. 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****Substance**

Carbon monoxide  
Carbon dioxide.  
Hydrogen Chloride  
Hydrogen Fluoride

**Condition**

During combustion.  
During combustion.  
During combustion.  
During combustion.

**5.3. Advice 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. Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapours, in accordance with good industrial hygiene practice. 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.

**6.4. Reference to other sections**

Refer to Section 8 and Section 13 for more information

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Contents may be under pressure, open carefully. Avoid inhalation of thermal decomposition products. For industrial/occupational use only. Not for consumer sale or use. Store work clothes separately from other clothing, food and tobacco products. Avoid breathing dust/fume/gas/mist/vapours/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 oxidising 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. 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 in a well-ventilated place. Keep container tightly closed. Store at temperatures not exceeding 38C/100F. Store away from strong bases. Store away from oxidising agents.

### 7.3. Specific end use(s)

See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

## 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
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Manufacturer determined	TWA(8 hours):100 ppm	

UK HSC : UK Health and Safety Commission

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

#### Biological limit values

No biological limit values exist for any of the components listed in Section 3 of this safety data sheet.

#### Derived no effect level (DNEL)

Ingredient	Degradation Product	Population	Human exposure pattern	DNEL
trans-dichloroethylene		Consumer	Inhalation, Long-term exposure (24 hours), Systemic effects	198 mg/m <sup>3</sup>
trans-dichloroethylene		Consumer	Oral, Long-term exposure (24 hours), Systemic effects	57 mg/kg bw/d
trans-dichloroethylene		Worker	Inhalation, Long-term exposure (8 hours), Systemic effects	797 mg/m <sup>3</sup>

#### Predicted no effect concentrations (PNEC)

Ingredient	Degradation Product	Compartment	PNEC
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trans-dichloroethylene		Agricultural soil	0.0563 mg/kg d.w.
trans-dichloroethylene		Freshwater	0.0364 mg/l
trans-dichloroethylene		Freshwater sediments	0.5483 mg/kg d.w.
trans-dichloroethylene		Grassland average	0.0563 mg/kg d.w.
trans-dichloroethylene		Intermittent releases to water	0.3636 mg/l
trans-dichloroethylene		Marine water	0.0036 mg/l
trans-dichloroethylene		Marine water sediments	0.0548 mg/kg d.w.
trans-dichloroethylene		Sewage Treatment Plant	17 mg/l

**Recommended monitoring procedures:** Information on recommended monitoring procedures can be obtained from UK HSC

## 8.2. Exposure controls

In addition, refer to the annex for more information.

### 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. 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/vapours/spray. If ventilation is not adequate, use respiratory protection equipment. Provide ventilation adequate to maintain vapor concentration below lower explosive concentration.

### 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.

#### *Applicable Norms/Standards*

Use eye protection conforming to EN 166

#### 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

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:

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.

Half facepiece or full facepiece air-purifying respirator suitable for organic vapours

Organic vapour respirators may have short service life.

For questions about suitability for a specific application, consult with your respirator manufacturer.

#### *Applicable Norms/Standards*

Use a respirator conforming to EN 140 or EN 136: filter type A

### 8.2.3. Environmental exposure controls

Refer to Annex

## SECTION 9: Physical and chemical properties

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

Physical state	Liquid.
Specific Physical Form:	Liquid.
Colour	Colourless
Odor	Slight Odor
Odour threshold	<i>No data available.</i>
Melting point/freezing point	<i>Not applicable.</i>
Boiling point/boiling range	47.6 °C
Flammability (solid, gas)	Not applicable.
Flammable Limits(LEL)	7.5 % volume [ <i>Details:</i> Tested according to ASTM Method E681-15 (Per Annex A1, closed vessel test method for difficult-to-ignite materials)]
Flammable Limits(UEL)	15 % volume [ <i>Details:</i> Tested according to ASTM Method E681-15 (Per Annex A1, closed vessel test method for difficult-to-ignite materials)]
Flash point	No flash point [ <i>Details:</i> Tested according to ASTM Method D-3278-96 e-1 (additionally, not flammable below 250 C per KS M ISO 2592)]
Autoignition temperature	427 °C
Decomposition temperature	<i>No data available.</i>
pH	<i>substance/mixture is non-soluble (in water)</i>
Kinematic Viscosity	0.3 mm <sup>2</sup> /sec
Water solubility	< 10 ppm
Solubility- non-water	<i>No data available.</i>
Partition coefficient: n-octanol/water	<i>No data available.</i>
Vapour pressure	35,063.7 Pa [@ 20 °C ]
Density	1.2808 g/ml
Relative density	1.2808 [ <i>Ref Std:</i> WATER=1]
Relative Vapor Density	5.2

### 9.2. Other information

#### 9.2.2 Other safety characteristics

EU Volatile Organic Compounds	1,280.8 g/l
Evaporation rate	<i>No data available.</i>
Molecular weight	<i>Not applicable.</i>
Percent volatile	100 %

## 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.

Strong oxidising agents.

### **10.6 Hazardous decomposition products**

<b><u>Substance</u></b>	<b><u>Condition</u></b>
Carbon monoxide	At elevated temperatures. - extreme conditions of heat
Carbon dioxide.	At elevated temperatures. - extreme conditions of heat
Hydrogen Chloride	At elevated temperatures. - extreme conditions of heat
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.

## **SECTION 11: Toxicological information**

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 11 are based on UN GHS calculation rules and classifications derived from internal hazard assessments.

### **11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008**

#### **Signs and Symptoms of Exposure**

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

##### **Inhalation**

Respiratory tract irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. May cause additional health effects (see below).

##### **Skin contact**

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

##### **Eye contact**

Moderate eye irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

##### **Ingestion**

Gastrointestinal irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhoea. May cause additional health effects (see below).

#### **Additional Health Effects:**



**Single exposure may cause target organ effects:**

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	Ingestion		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapour (4 hours)	Rat	LC50 > 22.1 mg/l
trans-dichloroethylene	Dermal	Rabbit	LD50 > 5,000 mg/kg
trans-dichloroethylene	Inhalation-Vapour (4 hours)	Rat	LC50 95.6 mg/l
trans-dichloroethylene	Ingestion	Rat	LD50 7,902 mg/kg
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Dermal	Rat	LD50 > 2,000 mg/kg
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation-Vapour (4 hours)	Rat	LC50 > 430 mg/l
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Ingestion	Rat	LD50 > 2,000 mg/kg

ATE = acute toxicity estimate

**Skin Corrosion/Irritation**

Name	Species	Value
trans-dichloroethylene	Rabbit	Minimal irritation
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Rabbit	No significant irritation

**Serious Eye Damage/Irritation**

Name	Species	Value
trans-dichloroethylene	Rabbit	Moderate irritant
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Rabbit	No significant irritation

**Skin Sensitisation**

Name	Species	Value
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Mouse	Not classified

**Respiratory Sensitisation**

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

**Germ Cell Mutagenicity**

Name	Route	Value
trans-dichloroethylene	In Vitro	Not mutagenic
trans-dichloroethylene	In vivo	Not mutagenic
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	In Vitro	Not mutagenic
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	In vivo	Not mutagenic

**Carcinogenicity**

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

## Reproductive Toxicity

### Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test result	Exposure Duration
trans-dichloroethylene	Inhalation	Not classified for development	Rat	NOAEL 24 mg/l	during organogenesis
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation	Not classified for female reproduction	Rat	NOAEL 281 mg/l	premating into lactation
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation	Not classified for male reproduction	Rat	NOAEL 281 mg/l	28 days
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation	Not classified for development	Rat	NOAEL 281 mg/l	premating into lactation

### Target Organ(s)

#### Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
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
trans-dichloroethylene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification		NOAEL Not available	
trans-dichloroethylene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Rat	LOAEL 4,500 mg/kg	not applicable

#### Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
trans-dichloroethylene	Inhalation	endocrine system   liver   kidney and/or bladder   respiratory system	Not classified	Rat	NOAEL 16 mg/l	90 days
trans-dichloroethylene	Ingestion	kidney and/or bladder	Not classified	Rat	NOAEL 2,000 mg/kg/day	14 weeks
trans-dichloroethylene	Ingestion	blood   liver	Not classified	Rat	NOAEL 125 mg/kg/day	14 weeks
trans-dichloroethylene	Ingestion	heart   immune system   respiratory system	Not classified	Rat	NOAEL 2,000 mg/kg/day	14 weeks
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation	endocrine system   liver   heart   hematopoietic system   immune system   nervous system   kidney and/or bladder	Not classified	Rat	NOAEL 281 mg/l	28 days
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Inhalation	respiratory system	Not classified	Rat	NOAEL 143 mg/l	5 days
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Ingestion	liver   kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 150 mg/kg/day	28 days
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	Ingestion	endocrine system   bone, teeth, nails, and/or hair   hematopoietic system   heart   immune system   nervous system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days

**Aspiration Hazard**

For the component/components, either no data is currently available or the data is 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.**

**11.2. Information on other hazards**

This material does not contain any substances that are assessed to be an endocrine disruptor for human health.

**SECTION 12: Ecological information**

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 12 are based on UN GHS calculation rules and classifications derived from 3M assessments.

**12.1. Toxicity**

No product test data available.

Material	CAS #	Organism	Type	Exposure	Test endpoint	Test result
trans-dichloroethylene	156-60-5	Bluegill	Estimated	96 hours	LC50	135 mg/l
trans-dichloroethylene	156-60-5	Green algae	Experimental	48 hours	EC50	36.36 mg/l
trans-dichloroethylene	156-60-5	Water flea	Experimental	48 hours	LC50	220 mg/l
trans-dichloroethylene	156-60-5	Anaerobic sludge	Experimental	96 hours	IC50	48 mg/l
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Activated sludge	Experimental	3 hours	EC50	>1,000 mg/l
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Green algae	Experimental	72 hours	No tox obs at lmt of water sol	>100 mg/l
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Medaka	Experimental	96 hours	No tox obs at lmt of water sol	>100 mg/l
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Water flea	Experimental	48 hours	No tox obs at lmt of water sol	>100 mg/l

**12.2. Persistence and degradability**

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
trans-dichloroethylene	156-60-5	Experimental Biodegradation	28 days	Percent degraded	8 %BOD/ThO D	OECD 301D - Closed bottle test
trans-dichloroethylene	156-60-5	Experimental Photolysis		Photolytic half-life (in air)	13 days (t 1/2)	
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Experimental Biodegradation	28 days	BOD	0 %BOD/ThO D	OECD 301D - Closed bottle test
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-3-methoxy-4-(trifluoromethyl)-	132182-92-4	Experimental Photolysis		Photolytic half-life (in air)	2.63 years (t 1/2)	

**12.3 : Bioaccumulative potential**

Material	Cas No.	Test type	Duration	Study Type	Test result	Protocol
trans-dichloroethylene	156-60-5	Experimental Bioconcentration		Log Kow	2.06	

**12.4. Mobility in soil**

Material	Cas No.	Test type	Study Type	Test result	Protocol
trans-dichloroethylene	156-60-5	Estimated Mobility in Soil	Koc	61 l/kg	Episuite™

**12.5. Results of the PBT and vPvB assessment**

This material does not contain any substances that are assessed to be a PBT or vPvB

**12.6. Endocrine disrupting properties**

This material does not contain any substances that are assessed to be an endocrine disruptor for environmental effects

**12.7. Other adverse effects**

No information available.

## SECTION 13: Disposal considerations

**13.1 Waste treatment 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 halogen acid (HCl/HF/HBr). 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.

The coding of a waste stream is based on the application of the product by the consumer. Since this is out of the control of 3M, no waste code(s) for products after use will be provided. Please refer to the European Waste Code (EWC - 2000/532/EC and amendments) to assign the correct waste code to your waste stream. Ensure national and/or regional regulations are complied with and always use a licensed waste contractor.

**EU waste code (product as sold)**

- 070103\* Organic halogenated solvents, washing liquids and mother liquors
- 14 06 02\* Other halogenated solvents and solvent mixtures

## SECTION 14: Transportation information

Not hazardous for transportation.

	Ground Transport (ADR)	Air Transport (IATA)	Marine Transport (IMDG)

<b>14.1 UN number or ID number</b>	No data available.	No data available.	No data available.
<b>14.2 UN proper shipping name</b>	No data available.	No data available.	No data available.
<b>14.3 Transport hazard class(es)</b>	No data available.	No data available.	No data available.
<b>14.4 Packing group</b>	No data available.	No data available.	No data available.
<b>14.5 Environmental hazards</b>	No data available.	No data available.	No data available.
<b>14.6 Special precautions for user</b>	Please refer to the other sections of the SDS for further information.	Please refer to the other sections of the SDS for further information.	Please refer to the other sections of the SDS for further information.
<b>14.7 Marine Transport in bulk according to IMO instruments</b>	No data available.	No data available.	No data available.
<b>Control Temperature</b>	No data available.	No data available.	No data available.
<b>Emergency Temperature</b>	No data available.	No data available.	No data available.
<b>ADR Classification Code</b>	No data available.	No data available.	No data available.
<b>IMDG Segregation Code</b>	No data available.	No data available.	No data available.

Please contact the address or phone number listed on the first page of the SDS for additional information on the transport/shipment of the material by rail (RID) or inland waterways (ADN).

## 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. The components of this material are in compliance with the provisions of Japan Chemical Substance Control Law. 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.

**DIRECTIVE 2012/18/EU**

Seveso hazard categories, Annex 1, Part 1

None

Seveso named dangerous substances, Annex 1, Part 2

Dangerous Substances	Identifier(s)	Qualifying quantity (tonnes) for the application of	
		Lower-tier requirements	Upper-tier requirements
trans-dichloroethylene	156-60-5	10	50

**Regulation (EU) No 649/2012**

No chemicals listed

**15.2. Chemical Safety Assessment**

A chemical safety assessment has not been carried out for this mixture. Chemical safety assessments for the contained substances may have been carried out by the registrants of the substances in accordance with Regulation (EC) No 1907/2006, as amended.

**SECTION 16: Other information****List of relevant H statements**

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H336	May cause drowsiness or dizziness.
H412	Harmful to aquatic life with long lasting effects.

**Revision information:**

EU Section 09: pH information information was added.  
Industrial Laboratory Use: Section 16: Annex information was modified.  
Industrial Use as a Solvent: Section 16: Annex information was modified.  
Industrial Use in Vapour Degreasing Systems: Section 16: Annex information was modified.  
Professional Laboratory Use: Section 16: Annex information was modified.  
Professional Use as a Solvent: Section 16: Annex information was modified.  
Label: CLP Precautionary - Disposal information was deleted.  
Label: CLP Supplemental Precautionary Statements information was deleted.  
Section 02: SDS Elements: CLP Supplemental Precautionary Statements information was added.  
Section 03: Composition table % Column heading information was added.  
Section 3: Composition/ Information of ingredients table information was modified.  
Section 03: Substance not applicable information was added.  
Section 04: First Aid - Symptoms and Effects (CLP) information was added.  
Section 04: Information on toxicological effects information was modified.  
Section 5: Fire - Advice for fire fighters information information was modified.  
Section 5: Fire - Special hazards information information was modified.  
Section 6: Accidental release clean-up information information was modified.  
Section 6: Accidental release personal information information was modified.  
Section 7: Precautions safe handling information information was modified.  
Section 8: Appropriate Engineering controls information information was modified.  
Section 8: Occupational exposure limit table information was modified.  
Section 8: Personal Protection - Respiratory Information information was modified.  
Section 8: Personal Protection - Skin/hand information information was modified.  
Section 8: Personal Protection - Thermal hazards information information was deleted.  
Section 9: Evaporation Rate information information was deleted.  
Section 9: Explosive properties information information was deleted.

Section 09: Kinematic Viscosity information information was added.  
 Section 9: Melting point information information was modified.  
 Section 9: Oxidising properties information information was deleted.  
 Section 9: pH information information was deleted.  
 Section 9: Property description for optional properties information was modified.  
 Section 9: Vapour density value information was added.  
 Section 9: Vapour density value information was deleted.  
 Section 9: Viscosity information information was deleted.  
 Section 11: Classification disclaimer information was modified.  
 Section 11: No endocrine disruptor information available warning information was added.  
 Section 11: Target Organs - Repeated Table information was added.  
 Section 11: Target Organs - Repeated Table information was deleted.  
 Section 12: 12.6. Endocrine Disrupting Properties information was added.  
 Section 12: 12.7. Other adverse effects information was modified.  
 Section 12: Component ecotoxicity information information was modified.  
 Section 12: Contact manufacturer for more detail. information was deleted.  
 Section 12: Mobility in soil information information was added.  
 Section 12: No endocrine disruptor information available warning information was added.  
 Section 12: Persistence and Degradability information information was modified.  
 Section 12: Biocumulative potential information information was modified.  
 Section 14 Classification Code – Main Heading information was added.  
 Section 14 Classification Code – Regulation Data information was added.  
 Section 14 Control Temperature – Main Heading information was added.  
 Section 14 Control Temperature – Regulation Data information was added.  
 Section 14 Disclaimer Information information was added.  
 Section 14 Emergency Temperature – Main Heading information was added.  
 Section 14 Emergency Temperature – Regulation Data information was added.  
 Section 14 Hazard Class + Sub Risk – Main Heading information was added.  
 Section 14 Hazard Class + Sub Risk – Regulation Data information was added.  
 Section 14 Hazardous/Not Hazardous for Transportation information was added.  
 Section 14 Other Dangerous Goods – Main Heading information was added.  
 Section 14 Other Dangerous Goods – Regulation Data information was added.  
 Section 14 Packing Group – Main Heading information was added.  
 Section 14 Packing Group – Regulation Data information was added.  
 Section 14 Proper Shipping Name information was added.  
 Section 14 Regulations – Main Headings information was added.  
 Section 14 Segregation – Regulation Data information was added.  
 Section 14 Segregation Code – Main Heading information was added.  
 Section 14 Special Precautions – Main Heading information was added.  
 Section 14 Special Precautions – Regulation Data information was added.  
 Section 14 Transport in bulk – Regulation Data information was added.  
 Section 14 Marine transport in bulk according to IMO instruments – Main Heading information was added.  
 Section 14 UN Number Column data information was added.  
 Section 14 UN Number information was added.  
 Section 15: Regulations - Inventories information was added.  
 Section 15: Seveso Substance Text information was added.  
 Section 2: No PBT/vPvB information available warning information was added.

## Annex

1. Title	
Substance identification	trans-dichloroethylene; EC No. 205-860-2; CAS Nbr 156-60-5;

<b>Exposure Scenario Name</b>	Industrial Laboratory Use
<b>Lifecycle Stage</b>	Widespread use by professional workers
<b>Contributing activities</b>	PROC 15 -Use a laboratory reagent ERC 08a -Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
<b>Processes, tasks and activities covered</b>	Use as a laboratory reagent.
<b>2. Operational conditions and risk management measures</b>	
<b>Operating Conditions</b>	<b>Physical state:</b> Liquid. <b>General operating conditions:</b> Duration of use; Indoors with LEV and good general ventilation;
<b>Risk management measures</b>	Under the operational conditions described above the following risk management measures apply: <b>General risk management measures:</b> <b>Human health:</b> None needed; <b>Environmental:</b> None needed;
<b>Waste management measures</b>	No use-specific waste management measures are required for this product. Refer to Section 13 of main SDS for disposal instructions:
<b>3. Prediction of exposure</b>	
<b>Prediction of exposure</b>	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

<b>1. Title</b>	
<b>Substance identification</b>	trans-dichloroethylene; EC No. 205-860-2; CAS Nbr 156-60-5;
<b>Exposure Scenario Name</b>	Industrial Use as a Solvent
<b>Lifecycle Stage</b>	Use at industrial sites
<b>Contributing activities</b>	PROC 07 -Industrial spraying PROC 08a -Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC 08b -Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC 10 -Roller application or brushing PROC 13 -Treatment of articles by dipping and pouring ERC 04 -Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC 07 -Use of functional fluid at industrial site
<b>Processes, tasks and activities covered</b>	Cleaning process equipment and parts. Cleaning surfaces by wiping, brushing. Spraying of substances/mixtures. Transfer of substance/mixture with dedicated engineering controls. Transfer of substances/mixtures into small containers e.g. tubes , bottles or small reservoirs.
<b>2. Operational conditions and risk management measures</b>	
<b>Operating Conditions</b>	<b>Physical state:</b> Liquid. <b>General operating conditions:</b> Discharge volume of sewage treatment plant: 2,000,000 liters per day; Emission days per year: 365 days per year; Flow rate of receiving surface water:: 18,000 cubic meters per day; Indoors with enhanced general ventilation; Indoors with good general ventilation; Large factory building (> 500 m³); Local freshwater dilution factor: 10 ; Local marine water dilution factor: 100 ;  <b>Task: Spraying;</b>



	Duration of use: 4 hours/day;  <b>Task: Transferring Material;</b> Duration of use: 4 hours/day;  <b>Task: Wiping Surfaces;</b> Duration of use: 4 hours/day;
<b>Risk management measures</b>	Under the operational conditions described above the following risk management measures apply: <b>General risk management measures:</b> <b>Human health:</b> None needed; <b>Environmental:</b> None needed;
<b>Waste management measures</b>	No use-specific waste management measures are required for this product. Refer to Section 13 of main SDS for disposal instructions:
<b>3. Prediction of exposure</b>	
<b>Prediction of exposure</b>	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

<b>1. Title</b>	
<b>Substance identification</b>	trans-dichloroethylene; EC No. 205-860-2; CAS Nbr 156-60-5;
<b>Exposure Scenario Name</b>	Industrial Use in Vapour Degreasing Systems
<b>Lifecycle Stage</b>	Use at industrial sites
<b>Contributing activities</b>	PROC 04 -Chemical production where opportunity for exposure arises PROC 08b -Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC 13 -Treatment of articles by dipping and pouring ERC 04 -Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC 07 -Use of functional fluid at industrial site
<b>Processes, tasks and activities covered</b>	Draining process equipment. Transfer of substance/mixture with dedicated engineering controls. Vapour Degreasing
<b>2. Operational conditions and risk management measures</b>	
<b>Operating Conditions</b>	<b>Physical state:</b> Liquid. <b>General operating conditions:</b> Discharge volume of sewage treatment plant: 2,000,000 liters per day; Duration of use: 8 hours/day; Emission days per year: 300 days per year; Flow rate of receiving surface water:: 18,000 cubic meters per day; Indoor use without Local Exhaust Ventilation; Local freshwater dilution factor: 10 ; Local marine water dilution factor: 100 ; Medium sized room or workshop ( 100 m³ - 500 m³); Partially open and partially closed process;
<b>Risk management measures</b>	Under the operational conditions described above the following risk management measures apply: <b>General risk management measures:</b> <b>Human health:</b> None needed; <b>Environmental:</b> None needed;
<b>Waste management measures</b>	Incinerate in a facility capable of handling halogenated waste;

<b>3. Prediction of exposure</b>	
<b>Prediction of exposure</b>	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

<b>1. Title</b>	
<b>Substance identification</b>	trans-dichloroethylene; EC No. 205-860-2; CAS Nbr 156-60-5;
<b>Exposure Scenario Name</b>	Professional Laboratory Use
<b>Lifecycle Stage</b>	Use at industrial sites
<b>Contributing activities</b>	PROC 15 -Use a laboratory reagent ERC 04 -Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
<b>Processes, tasks and activities covered</b>	Use as a laboratory reagent.
<b>2. Operational conditions and risk management measures</b>	
<b>Operating Conditions</b>	<b>Physical state:</b> Liquid. <b>General operating conditions:</b> Discharge volume of sewage treatment plant: 2,000,000 liters per day; Duration of use: 8 hours/day; Flow rate of receiving surface water:: 18,000 cubic meters per day; Indoors with LEV and good general ventilation; Local freshwater dilution factor: 10 ; Local marine water dilution factor: 100 ;
<b>Risk management measures</b>	Under the operational conditions described above the following risk management measures apply: <b>General risk management measures:</b> <b>Human health:</b> None needed; <b>Environmental:</b> None needed;
<b>Waste management measures</b>	Incinerate in a facility capable of handling halogenated waste;
<b>3. Prediction of exposure</b>	
<b>Prediction of exposure</b>	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

<b>1. Title</b>	
<b>Substance identification</b>	trans-dichloroethylene; EC No. 205-860-2; CAS Nbr 156-60-5;
<b>Exposure Scenario Name</b>	Professional Use as a Solvent
<b>Lifecycle Stage</b>	Widespread use by professional workers
<b>Contributing activities</b>	PROC 08a -Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC 08b -Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC 10 -Roller application or brushing PROC 11 -Non industrial spraying PROC 13 -Treatment of articles by dipping and pouring ERC 08a -Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC 09a -Widespread use of functional fluid (indoor)
<b>Processes, tasks and activities covered</b>	Cleaning process equipment and parts. Cleaning surfaces by wiping, brushing. Spraying of substances/mixtures. Transfer of substance/mixture with dedicated engineering controls. Transfer of substances/mixtures into small containers e.g. tubes , bottles or small reservoirs.

<b>2. Operational conditions and risk management measures</b>	
<b>Operating Conditions</b>	<p><b>Physical state:</b>Liquid.</p> <p><b>General operating conditions:</b> Indoors with good general ventilation; Medium sized room or workshop ( 100 m<sup>3</sup> - 500 m<sup>3</sup>);</p> <p><b>Task: Pouring Material - Liquids;</b> Duration of use: 15 min - 1 hour task;</p> <p><b>Task: Spraying;</b> Duration of use: 15 min - 1 hour task;</p> <p><b>Task: Wiping Surfaces;</b> Duration of use: 15 min - 1 hour task;</p>
<b>Risk management measures</b>	<p>Under the operational conditions described above the following risk management measures apply:</p> <p><b>General risk management measures:</b></p> <p><b>Human health:</b> None needed;</p> <p><b>Environmental:</b> None needed;</p>
<b>Waste management measures</b>	No use-specific waste management measures are required for this product. Refer to Section 13 of main SDS for disposal instructions:
<b>3. Prediction of exposure</b>	
<b>Prediction of exposure</b>	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.

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