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™ FA-188 Foam Additive

REACH registration number	CASRN	EC Number	Ingredient Name
01-2120743473-55-0000	3709-71-5	807-113-1	Trans-4-(Trifluoromethyl)perfluoro-2-pentene
01-2120743473-55-0001	3709-71-5	807-113-1	Trans-4-(Trifluoromethyl)perfluoro-2-pentene

Product Identification Numbers

UU-0090-9698-1

7100143605

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

Identified uses

For Industrial Use Only. Not Intended for Use as a Medical Device or Drug. For use as a foam insulation additive.

Restrictions on Use

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 Ireland Limited, The Iveagh Building, The Park, Carrickmines, Dublin 18.
Telephone: +353 1 280 3555
E Mail: tox.uk@mmm.com
Website: www.3M.com

1.4. Emergency telephone number
Emergency medical information: 8am-10pm (seven days) contact National Poisons Information Centre, Beaumont Hospital, Dublin 9 DOV2NO, Ireland. Telephone Number: +353 (0)1 809 2166

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.

CLASSIFICATION:
Acute Toxicity, Category 4 - Acute Tox. 4; H302
Hazardous to the Aquatic Environment (Acute), Category 1 - Aquatic Acute 1; H400
Hazardous to the Aquatic Environment (Chronic), Category 2 - Aquatic Chronic 2; H411

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) |GHS09 (Environment) |

Pictograms

Ingredients:

Ingredient	CAS Nbr	EC No.	% by Wt
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	807-113-1	90 - 100

HAZARD STATEMENTS:

H302	Harmful if swallowed.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

Prevention:

P273	Avoid release to the environment.

Response:

P391	Collect spillage.

3% of the mixture consists of components of unknown acute oral toxicity.

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

Ingredient	Identifier(s)	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	(CAS-No.) 3709-71-5 (EC-No.) 807-113-1	90 - 100	Aquatic Acute 1, H400,M=10 Aquatic Chronic 2, H411
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	(CAS-No.) 6792-31-0	<= 3	STOT SE 3, H335 Aquatic Acute 1, H400,M=10
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	(CAS-No.) 1584-03-8 (EC-No.) 216-436-1	< 0.1	Acute Tox. 1, H330 Aquatic Acute 1, H400,M=10 Aquatic Chronic 2, H411

Any entry in the Identifier(s) column that begins with the numbers 6, 7, 8, or 9 are a Provisional List Number provided by ECHA pending publication of the official EC Inventory Number for the substance.
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

3.2. Mixtures
Not applicable

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
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
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:
Harmful if swallowed.

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.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During combustion.
Carbon dioxide.	During combustion.
Hydrogen Fluoride	During combustion.
Toxic vapour, gas, particulate.	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
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
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
Avoid inhalation of thermal decomposition products. For industrial/occupational use only. Not for consumer sale or use. Avoid breathing dust/fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment.

7.2. Conditions for safe storage including any incompatibilities
Store away from heat. Store away from strong bases. Store away from amines.

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
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Manufacturer determined	TWA:6 ppm	

Ireland OELs : Ireland. OELs
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-4-(Trifluoromethyl)perfluoro-2-pentene		Worker	Inhalation, Long-term exposure (8 hours), Systemic effects	120 mg/m³

Predicted no effect concentrations (PNEC)

Ingredient	Degradation Product	Compartment	PNEC
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Agricultural soil	0.000369 mg/kg d.w.
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Freshwater	.00001 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Freshwater sediments	0.00316 mg/kg d.w.
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Grassland average	0.000369 mg/kg d.w.
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Marine water	.00000 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Internally collected customer use/exposure data	Marine water sediments	0.000316 mg/kg d.w.
Trans-4-(Trifluoromethyl)perfluoro-2-pentene		Sewage Treatment Plant	10 mg/l

Recommended monitoring procedures: Information on recommended monitoring procedures can be obtained from Indust. Inspect./Ministry (IE)

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.

8.2.2. Personal protective equipment (PPE)

Eye/face protection
None required.

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.
Gloves made from the following material(s) are recommended:

Material	**Thickness (mm)**	**Breakthrough Time**
Neoprene.	No data available	No data available

Applicable Norms/Standards
Use gloves tested to EN 374

If this product is used in a manner that presents a higher potential for exposure (eg. 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 protective clothing material(s) are recommended: Neoprene apron.

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

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.
Colour	Colourless
Odor	Odourless

Odour threshold	*No data available.*
Melting point/freezing point	< -80 ºC
Boiling point/boiling range	47.3 ºC [@ 101,325 Pa]
Flammability (solid, gas)	Not applicable.
Flammable Limits(LEL)	None detected
Flammable Limits(UEL)	None detected
Flash point	No flash point
Autoignition temperature	*No data available.*
Decomposition temperature	*No data available.*
pH	*substance/mixture is non-polar/aprotic*
Kinematic Viscosity	0.358 mm²/sec
Water solubility	0.649 mg/l [@ 22.3 ºC]
Solubility- non-water	*No data available.*
Partition coefficient: n-octanol/water	4.1
Vapour pressure	34.7 kPa [@ 20 ºC]
Density	1.6454 g/cm3 [@ 20 ºC]
Relative density	1.6454 [*Ref Std:*WATER=1]
Relative Vapour Density	*No data available.*
Particle Characteristics	*Not applicable.*

9.2. Other information

9.2.2 Other safety characteristics

EU Volatile Organic Compounds	1,600 g/l
Evaporation rate	*No data available.*
Molecular weight	300.05
Percent volatile	100 %
Self ignition temperature	405 ºC [*Details:*@ 1004 - 1028 hPa]

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
Heat.

10.5 Incompatible materials
Alcohols.
Amines.
Strong bases.

10.6 Hazardous decomposition products

Substance	**Condition**
None known.	

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. Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

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
May be harmful if inhaled. Respiratory tract irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

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
Harmful if swallowed.

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
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation-Vapour (4 hours)	Rat	LC50 > 21.69 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Ingestion	Rat	LD50 > 2,000 mg/kg
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	Inhalation-Vapour (4 hours)	Rat	LC50 > 179 mg/l
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	Inhalation-Vapour (4 hours)	Rat	LC50 0.49 mg/l

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value

Trans-4-(Trifluoromethyl)perfluoro-2-pentene	In vitro data	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	In vitro data	No significant irritation

Skin Sensitisation

Name	Species	Value
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	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-4-(Trifluoromethyl)perfluoro-2-pentene	In Vitro	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-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	Not classified for female reproduction	Rat	NOAEL 4.29 mg/l	premating into lactation
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	Not classified for development	Rat	NOAEL 6.74 mg/l	during gestation
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Ingestion	Not classified for male reproduction	Rat	NOAEL 450 mg/kg/day	28 days
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	Not classified for male reproduction	Rat	NOAEL 4.29 mg/l	25 days

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	respiratory system	Not classified	Rat	NOAEL 21.69 mg/l	4 hours
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	Inhalation	respiratory irritation	May cause respiratory irritation	Rat	LOAEL 55.78 mg/l	4 days

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	heart	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 3.04 mg/l	90 days
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Inhalation	endocrine system | hematopoietic system | liver | kidney and/or bladder | respiratory	Not classified	Rat	NOAEL 6.76 mg/l	90 days

		system | gastrointestinal tract | bone, teeth, nails, and/or hair | immune system | muscles | nervous system | eyes				
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	Ingestion	hematopoietic system | liver | auditory system | heart | endocrine system | bone, teeth, nails, and/or hair | bone marrow | immune system | nervous system | eyes | kidney and/or bladder | respiratory system | vascular system	Not classified	Rat	NOAEL 450 mg/kg/day	28 days
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 55.78 mg/l	4 days
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	Inhalation	liver | kidney and/or bladder	Not classified	Rat	NOAEL 185.92 mg/l	3 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

Chronic aquatic hazard:
No toxicity at limit of water solubility. Endpoint not reached at limit of water solubility.

No product test data available.

Material	CAS #	Organism	Type	Exposure	Test endpoint	Test result
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Green algae	Analogous Compound	72 hours	ErC50	0.035 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Water flea	Analogous Compound	48 hours	EC50	0.014 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Zebra Fish	Endpoint not reached	96 hours	LC50	>100 mg/l
Trans-4-(Trifluoromethyl)perflu	3709-71-5	Zebra Fish	Endpoint not reached	96 hours	LC50	>100 mg/l

oro-2-pentene						
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Green algae	Experimental	72 hours	EC50	0.035 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Water flea	Experimental	48 hours	EC50	0.014 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Green algae	Analogous Compound	72 hours	NOEC	0.017 mg/l
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Green algae	Experimental	72 hours	NOEC	0.017 mg/l
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Green algae	Analogous Compound	72 hours	EC50	0.035 mg/l
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Water flea	Analogous Compound	48 hours	EC50	0.014 mg/l
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Zebra Fish	Analogous Compound	96 hours	No tox obs at lmt of water sol	>100
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Green algae	Analogous Compound	72 hours	NOEC	0.017 mg/l
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Green algae	Analogous Compound	72 hours	EC50	0.035 mg/l
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Water flea	Analogous Compound	48 hours	EC50	0.014 mg/l
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Zebra Fish	Endpoint not reached	96 hours	LC50	>100 mg/l
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Green algae	Analogous Compound	72 hours	NOEC	0.017 mg/l

12.2. Persistence and degradability

Material	CAS Nbr	Test type	Duration	Study Type	Test result	Protocol
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Analogous Compound Biodegradation	28 days	BOD	<12 %BOD/ThOD	OECD 301D - Closed bottle test
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Experimental Biodegradation	28 days	BOD	<12 %BOD/ThOD	OECD 301D - Closed bottle test
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Analogous Compound Photolysis		Photolytic half-life (in air)	0.57 years (t 1/2)	
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Experimental Photolysis		Photolytic half-life (in air)	0.57 years (t 1/2)	
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Analogous Compound Biodegradation	28 days	BOD	<12 %BOD/ThOD	OECD 301D - Closed bottle test
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Analogous Compound Photolysis		Photolytic half-life (in air)	0.57 years (t 1/2)	
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Analogous Compound Biodegradation	28 days	BOD	<12 %BOD/ThOD	OECD 301D - Closed bottle test
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Analogous Compound Photolysis		Photolytic half-life (in air)	0.57 years (t 1/2)	

12.3 : Bioaccumulative potential

Material	Cas No.	Test type	Duration	Study Type	Test result	Protocol
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Analogous Compound Bioconcentration		Log Kow	4.1	OECD 107 log Kow shke flsk mtd
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Experimental Bioconcentration		Log Kow	4.1	OECD 107 log Kow shke flsk mtd
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Modeled Bioconcentration		Log Kow	6.8	Episuite™
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Analogous Compound Bioconcentration		Log Kow	4.1	OECD 107 log Kow shke flsk mtd

12.4. Mobility in soil

Material	Cas No.	Test type	Study Type	Test result	Protocol
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Analogous Compound Mobility in Soil	Koc	2,600 l/kg	OECD 121 Estim. of Koc by HPLC
Trans-4-(Trifluoromethyl)perfluoro-2-pentene	3709-71-5	Estimated Mobility in Soil	Koc	2,600 l/kg	OECD 121 Estim. of Koc by HPLC
1-Propeen, 1,1,2,3,3,3-hexafluor-, trimer	6792-31-0	Modeled Mobility in Soil	Koc	3,000,000 l/kg	Episuite™
2-Pentene, 1,1,1,3,4,4,5,5,5-nonafluoro-2-(trifluoromethyl)-	1584-03-8	Analogous Compound Mobility in Soil	Koc	2,600 l/kg	OECD 121 Estim. of Koc by HPLC

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 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.

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

	Ground Transport (ADR)	Air Transport (IATA)	Marine Transport (IMDG)
14.1 UN number or ID number	UN2810	UN2810	UN2810
14.2 UN proper shipping name	TOXIC LIQUID, ORGANIC, N.O.S.(FLUOROALKENE)	TOXIC LIQUID, ORGANIC, N.O.S.(FLUOROALKENE)	TOXIC LIQUID, ORGANIC, N.O.S.(FLUOROALKENE)
14.3 Transport hazard class(es)	6.1	6.1	6.1
14.4 Packing group	III	III	III
14.5 Environmental hazards	Environmentally Hazardous	Not applicable	Marine Pollutant
14.6 Special precautions for user	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.
14.7 Marine Transport in bulk according to IMO instruments	No data available.	No data available.	No data available.
Control Temperature	No data available.	No data available.	No data available.
Emergency Temperature	No data available.	No data available.	No data available.
ADR Classification Code	T1	Not applicable.	Not applicable.
IMDG Segregation Code	Not applicable.	Not applicable.	Not applicable.

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. 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

Hazard Categories	Qualifying quantity (tonnes) for the application of	
	Lower-tier requirements	Upper-tier requirements
E1 Hazardous to the Aquatic environment	100	200

Seveso named dangerous substances, Annex 1, Part 2
None

Regulation (EU) No 649/2012
No chemicals listed

15.2. Chemical Safety Assessment
A chemical safety assessment has been carried out for this substance/mixture in accordance with Regulation (EC) No 1907/2006, as amended.

SECTION 16: Other information

List of relevant H statements

H302	Harmful if swallowed.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Revision information:
Article Service Life and Disposal: Section 16: Annex information was deleted.
Section 3: Composition/ Information of ingredients table information was modified.
Section 8: DNEL table row information was modified.
Section 09: Particle Characteristics N/A information was added.
Section 11: Acute Toxicity table information was modified.
Section 11: Target Organs - Repeated Table information was modified.
Section 11: Target Organs - Single Table information was modified.
Section 12: Component ecotoxicity information information was modified.
Section 12: Mobility in soil information information was modified.
Section 12: Persistence and Degradability information information was modified.
Section 12:Bioccumulative potential information information was modified.
Two-column table displaying the unique list of H Codes and statements (std phrases) for all components of the given material. information was modified.
Transfer and injection of HFP Dimer during manufacture of Appliance and Construction Insulation panels: Section 16: Annex information was deleted.
Use in foam isolation panels: Section 16: Annex information was added.

Annex

1. Title	
Substance identification	Trans-4-(Trifluoromethyl)perfluoro-2-pentene; EC No. 807-113-1; CAS Nbr 3709-71-5;
Exposure Scenario Name	Manufacture
Lifecycle Stage	Manufacture
Contributing activities	PROC 01 -Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. PROC 09 -Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC 15 -Use a laboratory reagent ERC 01 -Manufacture of the substance
Processes, tasks and activities covered	Batch manufacture of a chemical substance or formulation (including polymerisation reactions). Closed sampling. Closed system transfers. Use as a laboratory reagent. Use in closed process.
2. Operational conditions and risk management measures	
Operating Conditions	**Physical state:**Liquid. **General operating conditions:** Batch process; Closed process; Continuous release; Discharge volume of sewage treatment plant: <= 682 cubic meters per day; Duration of use: <= 480 minute; Emission days per year: >= 320 days per year; Flow rate of receiving surface water:: <= 2,680,000 cubic meters per day; Indoor use with Local Exhaust Ventilation; Large factory building (> 500 m³); Local freshwater dilution factor: 3,930 ; Local marine water dilution factor: 500 ; **Task: Changing Filters**; Duration of exposure per day at workplace [for one worker]: 1 hours per task; **Task: Sampling**; Duration of exposure per day at workplace [for one worker]: <= 15 minutes per task; **Task: Pumping from or filling drums**; Duration of exposure per day at workplace [for one worker]: <= 2 hours per task; **Task: Laboratory use**; Indoors with LEV and enhanced general ventilation; Duration of exposure per day at workplace [for one worker]: 1 hours per task;
Risk management measures	Under the operational conditions described above the following risk management measures apply: **General risk management measures:** **Human health:** Chemical protective suit; Continuous monitoring with alarm; Protective Gloves - Chemical resistant. Refer to Section 8 of the SDS for specific glove material.; Supplied Air Suit (constant air) (APF 200); **Environmental:** None needed;

Waste management measures	Incinerate in a facility capable of handling halogenated waste;
3. Prediction of exposure	
Prediction of exposure	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.Contact 3M at the address or phone number listed on the first page of the SDS for information on exposure estimation.

1. Title	
Substance identification	Trans-4-(Trifluoromethyl)perfluoro-2-pentene; EC No. 807-113-1; CAS Nbr 3709-71-5;
Exposure Scenario Name	Use in foam isolation panels
Lifecycle Stage	Use at industrial sites
Contributing activities	PROC 01 -Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. PROC 03 -Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition ERC 05 -Use at industrial site leading to inclusion into/onto article
Processes, tasks and activities covered	Application of product. Closed system transfers. Transfer of substance/mixture with dedicated engineering controls. Use as a laboratory reagent. Use in closed process.
2. Operational conditions and risk management measures	
Operating Conditions	**Physical state:**Liquid. **General operating conditions:** Batch process; Closed process; Continuous process; Discharge volume of sewage treatment plant: <= 2,000,000 liters per day; Emission days per year: 330 days per year; Flow rate of receiving surface water:: <= 18,000 cubic meters per day; Indoors with enhanced general ventilation; Large factory building (> 500 m³); Local freshwater dilution factor: 10 ; Local marine water dilution factor: 100 ; Room size:: >= 104 m3; **Task: Charging - hard piped**; Duration of use: 1 - 4 hour(s); **Task: Pumping from or filling drums**; Duration of use: <= 24 minute; **Task: Laboratory use**; Duration of use: 1 - 4 hour(s);
Risk management measures	Under the operational conditions described above the following risk management measures apply: **General risk management measures:** **Human health:** Enhanced general ventilation; Provide extract ventilation to points where emissions occur; **Environmental:** None needed; ; The following task-specific risk management measures apply in addition to those listed above: **Task: Transferring Material**; **Human Health**;

	Closed loop transfer process with vapour return line; **Task: Laboratory use**; **Human Health**; Laminar Flow Bench - Horizontal; Keep sample containers closed when not in use;
Waste management measures	Incinerate in a permitted hazardous waste incinerator;
3. Prediction of exposure	
Prediction of exposure	Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted.Contact 3M at the address or phone number listed on the first page of the SDS for information on exposure estimation.

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