



# HFP Dimer

## Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878  
Issue date: 08/05/2025 Revision date: 30/07/2024 Supersedes version of: 01/03/2023 Version: 1.2

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

#### 1.1. Product identifier

Product form : Substance  
Trade name : HFP Dimer  
IUPAC name : (E)-1,1,1,2,3,4,5,5,5-Nonafluoro-4-(trifluoromethyl)pent-2-ene  
EC-No. : 807-113-1  
CAS-No. : 3709-71-5  
REACH registration No. : UK-01-8866236157-0  
Formula : C6F12

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

##### Relevant identified uses

Main use category : Industrial use, Professional use  
Use of the substance/mixture : Foam additive

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

F2 Chemicals Ltd  
Lea Lane  
Lea Town  
GB PR4 0RZ Preston  
UK  
T +44 (0) 1772 775800  
[safety@f2chemicals.com](mailto:safety@f2chemicals.com)

#### 1.4. Emergency telephone number

Emergency number : +44 (0) 1772 775833 (24 hr)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

##### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Aquatic Acute 1 H400  
Aquatic Chronic 2 H411  
Full text of hazard classes, H- and EUH-statements: see section 16

##### Adverse physicochemical, human health and environmental effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

#### 2.2. Label elements

##### Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS09

Signal word (CLP) : Warning

Hazard statements (CLP) : H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements (CLP) : P391 - Collect spillage.

#### 2.3. Other hazards

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII  
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

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Contains no PBT and/or vPvB substances  $\geq 0.1\%$  assessed in accordance with REACH Annex XIII

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	Perfluoro-4-methyl-2-pentene (3709-71-5)
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	Perfluoro-4-methyl-2-pentene (3709-71-5)

### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

Substance type	: Mono-constituent
Name	: Fluorotherm D
CAS-No.	: 3709-71-5
EC-No.	: 807-113-1

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Perfluoro-4-methyl-2-pentene	CAS-No.: 3709-71-5 EC-No.: 807-113-1 REACH-no: UK-01-8866236157-0	95 – 100	Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H- and EUH-statements: see section 16

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. If experiencing respiratory symptoms: Call a poison center or a doctor.
First-aid measures after skin contact	: Rinse skin with water/shower. Take off contaminated clothing. If skin irritation occurs: Get medical advice/attention.
First-aid measures after eye contact	: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
First-aid measures after ingestion	: If swallowed, seek medical advice immediately and show this container or label.

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

Symptoms/effects	: May be harmful if swallowed and enters airways.
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#### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media	: Dry chemical, CO <sub>2</sub> , or water spray or regular foam.
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#### 5.2. Special hazards arising from the substance or mixture

Fire hazard	: In case of fire and/or explosion do not breathe fumes.
Reactivity in case of fire	: Product is not explosive.
Hazardous decomposition products in case of fire	: Toxic fumes may be released.

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### 5.3. Advice for firefighters

Protection during firefighting : Use self-contained breathing apparatus and chemically protective clothing.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Clean up any spills as soon as possible, using an absorbent material to collect it.

#### For non-emergency personnel

Emergency procedures : Mechanically ventilate the spillage area. Avoid contact with skin and eyes.

#### For emergency responders

Protective equipment : Wear recommended personal protective equipment.

Emergency procedures : Ventilate area.

### 6.2. Environmental precautions

Prevent liquid from entering sewers, watercourses, underground or low areas. Toxic to aquatic life with long lasting effects.

### 6.3. Methods and material for containment and cleaning up

For containment : Absorb spilled material with sand or earth.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it.

Other information : Dispose of materials or solid residues at an authorized site.

### 6.4. Reference to other sections

No additional information available

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Additional hazards when processed : Not expected to present a significant hazard under anticipated conditions of normal use.

Precautions for safe handling : Do not eat, drink or smoke when using this product.

Hygiene measures : Always wash hands after handling the product.

### 7.2. Conditions for safe storage, including any incompatibilities

Incompatible products : Strong bases.

Storage temperature : < 45 °C

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### National occupational exposure and biological limit values

##### HFP Dimer (3709-71-5)

##### EU - Indicative Occupational Exposure Limit (IOEL)

IOEL TWA	≈ 6 ppm
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##### Perfluoro-4-methyl-2-pentene (3709-71-5)

##### EU - Indicative Occupational Exposure Limit (IOEL)

IOEL TWA	≈ 6 ppm
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### DNEL and PNEC

HFP Dimer (3709-71-5)	
DNEL/DMEL (Workers)	
Acute - systemic effects, inhalation	≈ 29 mg/m <sup>3</sup>

### 8.2. Exposure controls

#### Appropriate engineering controls

##### Appropriate engineering controls:

Ensure that there is a suitable ventilation system.

#### Personal protection equipment

##### Personal protective equipment:

ISO 374-1. Gloves.

##### Personal protective equipment symbol(s):



#### Environmental exposure controls

##### Environmental exposure controls:

Avoid release to the environment.

## SECTION 9: Physical and chemical properties

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

Physical state	: Liquid
Colour	: Colourless.
Appearance	: Liquid.
Molecular mass	: ≈ 300 g/mol
Odour	: Not available
Odour threshold	: Not available
Melting point	: Not available
Boiling point	: ≈ 48 °C
Flammability	: Not available
Explosive properties	: Product is not explosive.
Oxidising properties	: None.
Lower explosion limit	: Not available
Upper explosion limit	: Not available
Flash point	: > 48 °C
Auto-ignition temperature	: Not available
Decomposition temperature	: Not available
pH	: Not available
Viscosity, kinematic	: ≈ 0.36 mm <sup>2</sup> /s
Solubility	: Water: ≈ 0.65 mg/l
Partition coefficient n-octanol/water (Log Kow)	: Not available
Partition coefficient n-octanol/water (Log Pow)	: ≈ 4.1
Vapour pressure	: ≈ 34.7 mbar
Vapour pressure at 50°C	: ≈ 1 bar
Density	: ≈ 1.6 kg/l
Relative density	: Not available
Relative vapour density at 20°C	: Not available
Particle characteristics	: Not applicable

### 9.2. Other information

No additional information available

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### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

No additional information available

#### 10.4. Conditions to avoid

No additional information available

#### 10.5. Incompatible materials

No additional information available

#### 10.6. Hazardous decomposition products

No additional information available

### SECTION 11: Toxicological information

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

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified (Based on available data, the classification criteria are not met)
Skin corrosion/irritation	: Slightly irritant but not relevant for classification
Serious eye damage/irritation	: Slightly irritant but not relevant for classification
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified
Aspiration hazard	: Not classified

HFP Dimer (3709-71-5)	
Viscosity, kinematic	≈ 0.36 mm <sup>2</sup> /s

Perfluoro-4-methyl-2-pentene (3709-71-5)	
Viscosity, kinematic	≈ 0.36 mm <sup>2</sup> /s

#### 11.2. Information on other hazards

No additional information available

### SECTION 12: Ecological information

#### 12.1. Toxicity

Ecology - general	: Toxic to aquatic life.
Hazardous to the aquatic environment, short-term (acute)	: Very toxic to aquatic life.
Hazardous to the aquatic environment, long-term (chronic)	: Toxic to aquatic life with long lasting effects.

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HFP Dimer (3709-71-5)	
LC50 - Fish [1]	> 100 mg/l
EC50 - Crustacea [1]	≈ 0.014 mg/l
EC50 72h - Algae [1]	≈ 0.017 mg/l

Perfluoro-4-methyl-2-pentene (3709-71-5)	
LC50 - Fish [1]	> 100 mg/l
EC50 - Crustacea [1]	≈ 0.014 mg/l
EC50 72h - Algae [1]	≈ 0.017 mg/l

### 12.2. Persistence and degradability

HFP Dimer (3709-71-5)	
Persistence and degradability	Rapidly degradable

Perfluoro-4-methyl-2-pentene (3709-71-5)	
Persistence and degradability	Rapidly degradable

### 12.3. Bioaccumulative potential

HFP Dimer (3709-71-5)	
Partition coefficient n-octanol/water (Log Pow)	≈ 4.1

Perfluoro-4-methyl-2-pentene (3709-71-5)	
Partition coefficient n-octanol/water (Log Pow)	≈ 4.1

### 12.4. Mobility in soil

No additional information available

### 12.5. Results of PBT and vPvB assessment

HFP Dimer (3709-71-5)	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	

Component	
Substance(s) not meeting the PBT criteria of REACH regulation, in accordance with Annex XIII	Perfluoro-4-methyl-2-pentene (3709-71-5)
Substance(s) not meeting the vPvB criteria of REACH regulation, in accordance with Annex XIII	Perfluoro-4-methyl-2-pentene (3709-71-5)

### 12.6. Endocrine disrupting properties

No additional information available

### 12.7. Other adverse effects

No additional information available

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional waste regulation : Disposal must be done according to official regulations.






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### SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
<b>14.1. UN number or ID number</b>				
UN 3082	UN 3082	UN 3082	UN 3082	UN 3082
<b>14.2. UN proper shipping name</b>				
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene)	Environmentally hazardous substance, liquid, n.o.s. (Perfluoro-4-methyl-2-pentene)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene)
<b>Transport document description</b>				
UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene), 9, III, (-)	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene), 9, III, MARINE POLLUTANT	UN 3082 Environmentally hazardous substance, liquid, n.o.s. (Perfluoro-4-methyl-2-pentene), 9, III	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene), 9, III	UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Perfluoro-4-methyl-2-pentene), 9, III
<b>14.3. Transport hazard class(es)</b>				
9	9	9	9	9
				
<b>14.4. Packing group</b>				
III	III	III	III	III
<b>14.5. Environmental hazards</b>				
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes EmS-No. (Fire): F-A EmS-No. (Spillage): S-F	Dangerous for the environment: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes
No supplementary information available				

### 14.6. Special precautions for user

#### Overland transport

Classification code (ADR)	: M6
Special provisions (ADR)	: 274, 335, 375, 601
Limited quantities (ADR)	: 5I
Excepted quantities (ADR)	: E1
Packing instructions (ADR)	: P001, IBC03, LP01, R001
Special packing provisions (ADR)	: PP1
Mixed packing provisions (ADR)	: MP19
Portable tank and bulk container instructions (ADR)	: T4
Portable tank and bulk container special provisions (ADR)	: TP1, TP29
Tank code (ADR)	: LGBV
Vehicle for tank carriage	: AT
Transport category (ADR)	: 3
Special provisions for carriage - Packages (ADR)	: V12

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Special provisions for carriage - Loading, unloading  
and handling (ADR) : CV13  
Hazard identification number (Kemler No.) : 90  
Orange plates :



Tunnel restriction code (ADR) : -  
EAC code : •3Z

### Transport by sea

Special provisions (IMDG) : 274, 335, 969  
Limited quantities (IMDG) : 5 L  
Excepted quantities (IMDG) : E1  
Packing instructions (IMDG) : LP01, P001  
Special packing provisions (IMDG) : PP1  
IBC packing instructions (IMDG) : IBC03  
Tank instructions (IMDG) : T4  
Tank special provisions (IMDG) : TP1, TP29  
Stowage category (IMDG) : A

### Air transport

PCA Excepted quantities (IATA) : E1  
PCA Limited quantities (IATA) : Y964  
PCA limited quantity max net quantity (IATA) : 30kgG  
PCA packing instructions (IATA) : 964  
PCA max net quantity (IATA) : 450L  
CAO packing instructions (IATA) : 964  
CAO max net quantity (IATA) : 450L  
Special provisions (IATA) : A97, A158, A197, A215  
ERG code (IATA) : 9L

### Inland waterway transport

Classification code (ADN) : M6  
Special provisions (ADN) : 274, 335, 375, 601  
Limited quantities (ADN) : 5 L  
Excepted quantities (ADN) : E1  
Carriage permitted (ADN) : T  
Equipment required (ADN) : PP  
Number of blue cones/lights (ADN) : 0

### Rail transport

Classification code (RID) : M6  
Special provisions (RID) : 274, 335, 375, 601  
Limited quantities (RID) : 5L  
Excepted quantities (RID) : E1  
Packing instructions (RID) : P001, IBC03, LP01, R001  
Special packing provisions (RID) : PP1  
Mixed packing provisions (RID) : MP19  
Portable tank and bulk container instructions (RID) : T4  
Portable tank and bulk container special provisions (RID) : TP1, TP29  
Tank codes for RID tanks (RID) : LGBV  
Transport category (RID) : 3  
Special provisions for carriage – Packages (RID) : W12  
Special provisions for carriage - Loading, unloading  
and handling (RID) : CW13, CW31  
Colis express (express parcels) (RID) : CE8  
Hazard identification number (RID) : 90

### 14.7. Maritime transport in bulk according to IMO instruments

Not applicable



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### SECTION 15: Regulatory information

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

##### EU-Regulations

###### REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

###### REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

###### REACH Candidate List (SVHC)

Contains no substance(s) listed on the REACH Candidate List

###### PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

###### POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

###### Ozone Regulation (2024/590)

Not listed on the Ozone Depletion list (Regulation EU 2024/590)

###### Council Regulation (EC) for the control of dual-use items

Contains no substance subject to the COUNCIL REGULATION (EC) for the control of dual-use items

###### Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

###### Drug Precursors Regulation (EC 273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

#### 15.2. Chemical safety assessment

No additional information available

### SECTION 16: Other information

#### Indication of changes

Section	Changed item	Comments
2.1	Classification according to Regulation (EC) No. 1272/2008 [CLP]	<b>Added</b>

#### Full text of H- and EUH-statements:

Aquatic Acute 1	Hazardous to the aquatic environment – Acute Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment – Chronic Hazard, Category 2
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

F2 template (no freezing point)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.