



Perfluorobutane

Safety Data Sheet

according to the REACH Regulation (EC) 1907/2006 amended by Regulation (EU) 2020/878

Issue date: 04/12/2024 Revision date: 04/12/2024 Version: 4.1

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

1.1. Product identifier

| | |
|-----------------------|--|
| Product form | : Substance |
| Substance name | : Perfluorobutane |
| IUPAC name | : 1,1,1,2,2,3,3,4,4,4-Decafluorobutane |
| EC-No. | : 206-580-3 |
| CAS-No. | : 355-25-9 |
| REACH registration No | : UK-01-4898203257-4 |
| Formula | : C4F10 |

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

1.2.1. Relevant identified uses

Main use category : Industrial use, Professional use

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Manufacturer

F2 Chemicals Ltd
Lea Lane
Lea Town
PR4 0RZ Preston - UK
T +44 (0) 1772 775800
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]

Press. Gas (Liq.) H280

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

Adverse physicochemical, human health and environmental effects

Contains gas under pressure; may explode if heated.

2.2. Label elements

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

Hazard pictograms (CLP) :



GHS04

Signal word (CLP) : Warning

Hazard statements (CLP) : H280 - Contains gas under pressure; may explode if heated.

Labelling according to Directive 67/548/EEC or 1999/45/EC

2.3. Other hazards

Other hazards which do not result in classification : Contains fluorinated greenhouse gases covered by the Kyoto protocol. Refrigerated liquefied gas. Contact with product may cause cold burns or frostbite.

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SECTION 3: Composition/information on ingredients

3.1. Substances

Substance type : Mono-constituent

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|-----------------|---|-----|---|
| Perfluorobutane | (CAS-No.) 355-25-9 (EC-No.) 206-580-3 (REACH-no) UK-01-4898203257-4 | 100 | Press. Gas (Liq.), H280 |

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

3.2. Mixtures

Not applicable

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.
First-aid measures after skin contact : Wash skin with plenty of water. Thaw frosted parts with lukewarm water. Do not rub affected area.
First-aid measures after eye contact : Rinse eyes with water as a precaution.
First-aid measures after ingestion : Call a poison center or a doctor if you feel unwell.

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

Symptoms/effects : Contains refrigerated gas; may cause cryogenic burns or injury.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire : Toxic fumes may be released.

5.3. Advice for firefighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.
Other information : Move containers away from the fire area if this can be done without risk.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Ventilate spillage area.

6.1.2. For emergency responders

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

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

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

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Wear personal protective equipment.
Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Protect from sunlight. Store in a well-ventilated place. Keep cool.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

8.2. Exposure controls

Appropriate engineering controls:

Ensure good ventilation of the work station.

Hand protection:

Protective gloves

Eye protection:

Safety glasses

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment

Personal protective equipment symbol(s):



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 | : Gas |
| Appearance | : Clear, colorless gas. |
| Molecular mass | : ≈ 238 g/mol |
| Colour | : Colourless. |
| Odour | : Odourless. |
| Odour threshold | : Not applicable |
| pH | : Not applicable |
| Relative evaporation rate (butylacetate=1) | : No data available |
| Melting point | : ≈ -94.5 °C |
| Boiling point | : ≈ -1.6 °C |
| Flash point | : Not applicable (non-flammable gas) |
| Critical temperature | : ≈ 113.2 °C |
| Auto-ignition temperature | : Not applicable (non-flammable gas) |
| Decomposition temperature | : ≈ 400 °C |
| Flammability | : Non flammable. |
| Vapour pressure | : ≈ 380 kPa |
| Relative vapour density at 20 °C | : No data available |
| Relative density | : ≈ 1.517 |
| Relative gas density | : ≈ 19 |
| Solubility | : No data available |
| Partition coefficient n-octanol/water (Log Pow) | : No data available |
| Viscosity, kinematic | : ≈ 0.31 mm ² /s |

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| | |
|----------------------|--------------------------------------|
| Viscosity, dynamic | : ≈ 0.465 mPa·s |
| Explosive properties | : None. |
| Oxidising properties | : None. |
| Explosive limits | : Not applicable (non-flammable gas) |

9.2. Other information

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 dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

| | |
|-----------------------------------|--|
| Acute toxicity (oral) | : Not classified |
| Acute toxicity (dermal) | : Not classified |
| Acute toxicity (inhalation) | : Not classified |
| Skin corrosion/irritation | : Not classified pH: Not applicable |
| Serious eye damage/irritation | : Not classified pH: Not applicable |
| 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 applicable |

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| | |
|----------------------|-----------------------------------|
| Viscosity, kinematic | ≈ 0.31 mm ² /s |
|----------------------|-----------------------------------|

SECTION 12: Ecological information

12.1. Toxicity

| | |
|---|---|
| Ecology - general | : The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment. |
| Hazardous to the aquatic environment, short-term (acute) | : Not classified |
| Hazardous to the aquatic environment, long-term (chronic) | : Not classified |

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

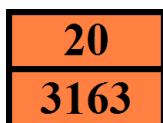
In accordance with ADR / IMDG / IATA / ADN / RID

| ADR | IMDG | IATA | ADN | RID |
|---|---|------------------------------------|------------------------------------|------------------------------------|
| 14.1. UN number | | | | |
| 3163 | 3163 | 3163 | 3163 | 3163 |
| 14.2. UN proper shipping name | | | | |
| LIQUEFIED GAS, N.O.S. | LIQUEFIED GAS, N.O.S. | Liquefied gas, n.o.s. | LIQUEFIED GAS, N.O.S. | LIQUEFIED GAS, N.O.S. |
| Transport document description | | | | |
| UN 3163 LIQUEFIED GAS, N.O.S., 2.2, (C/E) | UN 3163 LIQUEFIED GAS, N.O.S., 2.2 | UN 3163 Liquefied gas, n.o.s., 2.2 | UN 3163 LIQUEFIED GAS, N.O.S., 2.2 | UN 3163 LIQUEFIED GAS, N.O.S., 2.2 |
| 14.3. Transport hazard class(es) | | | | |
| 2.2 | 2.2 | 2.2 | 2.2 | 2.2 |
| 14.4. Packing group | | | | |
| Not applicable | Not applicable | Not applicable | Not applicable | Not applicable |
| 14.5. Environmental hazards | | | | |
| Dangerous for the environment : No | Dangerous for the environment : No Marine pollutant : No | Dangerous for the environment : No | Dangerous for the environment : No | Dangerous for the environment : No |
| No supplementary information available | | | | |

14.6. Special precautions for user

- Overland transport

Classification code (ADR) : 2A
 Special provisions (ADR) : 274, 662
 Limited quantities (ADR) : 120ml
 Excepted quantities (ADR) : E1
 Packing instructions (ADR) : P200
 Mixed packing provisions (ADR) : MP9
 Portable tank and bulk container instructions (ADR) : (M), T50
 Tank code (ADR) : PxBN(M)
 Tank special provisions (ADR) : TA4, TT9
 Vehicle for tank carriage : AT
 Transport category (ADR) : 3
 Special provisions for carriage - Loading, unloading and handling (ADR) : CV9, CV10, CV36
 Hazard identification number (Kemler No.) : 20
 Orange plates :



Tunnel restriction code (ADR) : C/E
 EAC code : 2TE

- Transport by sea

Special provisions (IMDG) : 274
 Packing instructions (IMDG) : P200

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| | |
|--------------------------|-------|
| Tank instructions (IMDG) | : T50 |
| EmS-No. (Fire) | : F-C |
| EmS-No. (Spillage) | : S-V |
| Stowage category (IMDG) | : A |

- Air transport

| | |
|--|-------------|
| PCA Excepted quantities (IATA) | : E1 |
| PCA Limited quantities (IATA) | : Forbidden |
| PCA limited quantity max net quantity (IATA) | : Forbidden |
| PCA packing instructions (IATA) | : 200 |
| PCA max net quantity (IATA) | : 75kg |
| CAO packing instructions (IATA) | : 200 |
| CAO max net quantity (IATA) | : 150kg |
| ERG code (IATA) | : 2L |

- Inland waterway transport

| | |
|-----------------------------------|------------|
| Classification code (ADN) | : 2A |
| Special provisions (ADN) | : 274, 662 |
| Limited quantities (ADN) | : 120 ml |
| Excepted quantities (ADN) | : E1 |
| Equipment required (ADN) | : PP |
| Number of blue cones/lights (ADN) | : 0 |

- Rail transport

| | |
|---|-------------------|
| Special provisions (RID) | : 274, 662 |
| Excepted quantities (RID) | : E1 |
| Packing instructions (RID) | : P200 |
| Mixed packing provisions (RID) | : MP9 |
| Portable tank and bulk container instructions (RID) | : T50(M) |
| Special provisions for RID tanks (RID) | : TA4, TT9, TM6 |
| Transport category (RID) | : 3 |
| Special provisions for carriage - Loading, unloading and handling (RID) | : CW9, CW10, CW36 |
| Colis express (express parcels) (RID) | : CE3 |
| Hazard identification number (RID) | : 20 |

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

Perfluorobutane is not on the REACH Candidate List

Perfluorobutane is not on the REACH Annex XIV List

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: Other information

Full text of H- and EUH-statements:

| | |
|-------------------|---|
| H280 | Contains gas under pressure; may explode if heated. |
| Press. Gas (Liq.) | Gases under pressure : Liquefied gas |

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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.