

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

1.1. Product identifier

Product form	: Substance
Trade name	: HFO 1336mzz-Z
Name	: (2Z)-1,1,1,4,4,4-hexafluorobut-2-ene
EC-No.	: 700-651-7
CAS-No.	: 692-49-9
REACH registration No.	: 01-2119929623-35
Product code	: 100133600

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

Relevant identified uses

Main use category	: Professional use,Industrial use
Use of the substance/mixture	: Blowing agent Heat transfer fluids

1.3. Details of the supplier of the safety data sheet

Supplier

Dehon Service SAS
 26 Avenue du Petit Parc
 94683 VINCENNES Cedex
 France
 T 01 43 98 75 00

ContactFDS@climalife.dehon.com

Other

Climalife Kft Budepesta sucursală Bucuresti Romania
 Strada Teodosie Rudeanu, Nr. 49A
 Biroul NR 4, Modulul I
 011257 Bucuresti Sector 1
 Romania
 T +40 311 096 804

ContactFDS@climalife.dehon.com

Other

Dehon Kälte-Fachvertriebs GmbH
 Robert-Bosch-Strasse 14
 40668 MEERBUSCH
 Germany
 T 00 49 2150 7073 0 , F 00 49 2150 7073 17

ContactFDS@climalife.dehon.com

Other

Dehon Service Belgium s.a/n.v.
 Avenue Carton de Wiart, 79
 1090 Bruxelles
 Belgium
 T 00 32 2 421 01 70, F 00 32 2 426 96 62

ContactFDS@climalife.dehon.com

Other

Friogas sa
 Poligono Industrial SEPES
 Parcela 10
 46500 SAGUNTO (Valencia)
 Spain
 T 00 34 9 6 266 36 32, F 00 34 9 6 266 50 25

ContactFDS@climalife.dehon.com

Other

Other

Climalife Hongrie Kft.
 Villányi út 47
 1118 Budapest
 Hungary
 T (36) 23 431 660

ContactFDS@climalife.dehon.com

Other

Climalife Italia Srl
 Viale Delle Industrie 57
 20881 Bernareggio(MB)
 Italia
 T +39 39-5973480, F

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Other

Dehon nordic service
 Östra Hamngatan 50B 3tr
 41109 GÖTEBORG
 Sweden
 T 00 46 44 21 58 80

ContactFDS@climalife.dehon.com

Other

Dehon Service Nerderland B.V.
 Van Konijnenburgweg 84
 NL-4612 PL Bergen Op Zoom
 Netherlands
 T 00 31 164 212 830

ContactFDS@climalife.dehon.com

Other

IDS Refrigeration Limited
 22 Apex Court, Woodlands, Bradley Stoke
 BS32 4JT Bristol
 United Kingdom
 T 00 44 1179 802520

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Other

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Prochimac SA
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T 00 41 32 727 36 00, F 00 41 32 727 36 19
ContactFDS@climalife.dehon.com

Other

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China
T +86 21 6442 3972, F +86 21 6442 3952
ContactFDS@climalife.dehon.com

Other

Teknaly Middle East FZCO
B34BS33O203, Jebel Ali Freezone
Dubai
United Arab Emirates
ContactFDS@climalife.dehon.com

Galco s.a/n.v.
Avenue Carton de Wiart, 79
1090 BRUSSELS
Belgium
T 00 32 2 421 01 84, F 00 32 2 421 01 84 / 00 32 2 425 38 12
ContactFDS@climalife.dehon.com

Other

Galco Singapore Branch
135 Cecil Street #10-01
69536 Singapore
ContactFDS@climalife.dehon.com

1.4. Emergency telephone number

Emergency number : +33 (0) 1 72 11 00 03

Country/Area	Organisation/Company	Address	Emergency number	Comment
Ireland	National Poisons Information Centre Beaumont Hospital	PO Box 1297 Beaumont Road 9 Dublin	+353 1 809 2566 (Healthcare professionals- 24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7)	
United Kingdom	National Poisons Information Service (Birmingham Centre) City Hospital	Dudley Road B18 7QH	0344 892 0111	Only for healthcare professionals

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Not classified

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

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

Extra phrases : Greenhouse fluorinated gas falling within Kyoto Protocol (GWP = 2,08).

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

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

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : (2Z)-1,1,1,4,4,4-hexafluorobut-2-ene

CAS-No. : 692-49-9

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EC-No. : 700-651-7

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2-Butene, 1,1,1,4,4,4-hexafluoro-, (2Z)-	CAS-No.: 692-49-9 EC-No.: 700-651-7	≤ 99	Not classified

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Move the affected person away from the contaminated area and into the fresh air. Give artificial respiration if necessary. Get medical advice/attention.
- First-aid measures after skin contact : Remove clothing and rinse skin with water. May cause frostbite.
- First-aid measures after eye contact : Rinse cautiously with water for several minutes. Obtain medical attention if pain, blinking or redness persists.
- First-aid measures after ingestion : Rinse mouth. Do NOT induce vomiting. Call a physician immediately.

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

No additional information available

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 : Water spray. Foam. Chemical powder. Carbon dioxide.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Pressure increase.
- Hazardous decomposition products in case of fire : fluorinated compounds. Hydrogen fluoride. Carbon oxides (CO, CO₂).

5.3. Advice for firefighters

- Protection during firefighting : Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate personnel to a safe area. Ventilate area. Do not attempt to take action without suitable protective equipment.

6.2. Environmental precautions

Do not allow product to spread into the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Cover spill with non combustible material, e.g.: sand, earth, vermiculite. Dike and contain spill. Place in an appropriate container and dispose of the contaminated material at a licensed site.

6.4. Reference to other sections

No additional information available

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid contact with skin, eyes and clothing. Do not breathe vapours, mist. Provide for appropriate exhaust ventilation at places of vapours accumulation. Do not attempt to take action without suitable protective equipment. See Section 8.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in original container. Keep the container hermetically sealed. Store in dry, cool, well-ventilated area.
Storage temperature : < 52 °C

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Exposure controls

Appropriate engineering controls

Appropriate engineering controls:

Ensure that there is a suitable ventilation system.

Personal protection equipment

Eye and face protection

Eye protection:

Safety glasses with side shields

Skin protection

Skin and body protection:

Impermeable clothing

Hand protection:

Insulating protective gloves

Respiratory protection

Respiratory protection:

No special respiratory protection equipment is recommended under normal conditions of use with adequate ventilation. In the event of exposure to high concentrations : Self-contained breathing apparatus

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Colour : Colourless.
Appearance : pale.
Molecular mass : 164 g/mol
Odour : odourless.
Odour threshold : Not available
Melting point : Not available
Freezing point : Not available
Boiling point : 33.4 °C
Flammability : Not available
Lower explosion limit : None
Upper explosion limit : None

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Flash point	: NA
Auto-ignition temperature	: 492 °C
Decomposition temperature	: Not available
pH	: 7.4 (20°C)
Viscosity, kinematic	: Not available
Solubility	: Water: 0.7633 g/l (25°C)
Partition coefficient n-octanol/water (Log Kow)	: Not available
Partition coefficient n-octanol/water (Log Pow)	: 2.3 (30°C)
Vapour pressure	: 0.6 bar (20°C)
Vapour pressure at 50°C	: 1.8 bar
Density	: 1.38 g/cm ³ (20°C)
Relative density	: Not available
Relative vapour density at 20°C	: Not available
Particle characteristics	: Not applicable

9.2. Other information

Other safety characteristics

VOC content : 100 %

SECTION 10: Stability and reactivity

10.1. Reactivity

May decompose at high temperature.

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

No dangerous polymerization.

10.4. Conditions to avoid

high temperatures, naked flames. The product is not flammable. Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.

10.5. Incompatible materials

alkali metals. Alkaline earth metals. Metallic powders. Powdered metallic salts.

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

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LC50 Inhalation - Rat > 690.413 mg/l/4h

Skin corrosion/irritation : Not classified
pH: 7.4 (20°C)

2-Butene, 1,1,1,4,4,4-hexafluoro-, (2Z)- (692-49-9)

pH 7.4 Temp.: 20 °C

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Serious eye damage/irritation : Not classified
pH: 7.4 (20°C)

2-Butene, 1,1,1,4,4,4-hexafluoro-, (2Z)- (692-49-9)

pH	7.4 Temp.: 20 °C
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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

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LOAEC (inhalation, rat, gas, 90 days)	50.3 mg/l
NOAEC (inhalation, rat, gas, 90 days)	33.5 mg/l

Aspiration hazard : Not classified

11.2. Information on other hazards

Endocrine disrupting properties

Adverse health effects caused by endocrine disrupting properties : The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Not classified

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LC50 - Fish [1]	76.1 mg/l <i>Oryzias latipes</i> (Ricefish)
EC50 - Crustacea [1]	22.5 mg/l 48 Hours (<i>Daphnia magna</i>)
ErC50 other aquatic plants	> 23.7 mg/l 72 Hours (<i>Pseudokirchneriella subcapitata</i>)
NOEC chronic fish	10 mg/l (<i>Gobiocypris rarus</i>)
NOEC chronic crustacea	10 mg/l (<i>Daphnia magna</i>)
NOEC chronic algae	6.92 mg/l 72 Hours (<i>Pseudokirchneriella subcapitata</i>)

2-Butene, 1,1,1,4,4,4-hexafluoro-, (2Z)- (692-49-9)

LC50 - Fish [1]	76.1 mg/l Test organisms (species): <i>Oryzias latipes</i>
EC50 - Crustacea [1]	22.5 mg/l Test organisms (species): <i>Daphnia magna</i>
EC50 72h - Algae [1]	> 23.7 mg/l Test organisms (species): <i>Raphidocelis subcapitata</i> (previous names: <i>Pseudokirchneriella subcapitata</i> , <i>Selenastrum capricornutum</i>)
LOEC (chronic)	> 10 mg/l Test organisms (species): <i>Daphnia magna</i> Duration: '21 d'
NOEC (chronic)	10 mg/l Test organisms (species): <i>Daphnia magna</i> Duration: '21 d'
NOEC chronic fish	10 mg/l Test organisms (species): other: Duration: '32 d'

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12.2. Persistence and degradability

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Persistence and degradability: Not biodegradable.

2-Butene, 1,1,1,4,4,4-hexafluoro-, (2Z)- (692-49-9)

Persistence and degradability: Rapidly degradable

12.3. Bioaccumulative potential

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Partition coefficient n-octanol/water (Log Pow): 2.3 (30°C)

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

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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

12.6. Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties : The mixture does not contain substance(s) included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at a concentration equal to or greater than 0,1 %.

12.7. Other adverse effects

Other adverse effects : ODP (R-11=1)=0.

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Other information: GWP (CO₂=1/100 years) = 2,08

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Entrust the thoroughly decontaminated packaging to a licensed waste-contractor. Refer to manufacturer or supplier for information on recovery or recycling. Conform to current legislation, regulations and orders.

Additional information : The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
14.1. UN number or ID number			
Not regulated for transport			
14.2. UN proper shipping name			
Not regulated	Not regulated	Not regulated	Not regulated

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ADR	IMDG	IATA	RID
14.3. Transport hazard class(es)			
Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group			
Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards			
Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available			

14.6. Special precautions for user

Overland transport

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

Rail transport

Not regulated

14.7. Maritime transport in bulk according to IMO instruments

Not applicable

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

VOC Directive (2004/42)

VOC content : 100 %

Explosives Precursors Regulation (EU 2019/1148)

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

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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
	Issue date	Removed
1.2	Use of the substance/mixture	Modified

Safety Data Sheet (SDS), EU

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.