



FE-36 Fire Extinguishing Agent

Version 6.1 (replaces: Version 6.0)

Revision Date 11.01.2017

Ref. 130000000697

This Safety Data Sheet adheres to the standards and regulatory requirements of Great Britain and may not meet the regulatory requirements in other countries.

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

1.1. Product identifier

Product name : FE-36 Fire Extinguishing Agent

Registration number : 01-0000017172-78-0000

Synonyms : 1,1,1,3,3,3-Hexafluoropropane
HFC-236fa

Identification number : CAS-No. 690-39-1 EC-No. 425-320-1

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

Use of the Substance/Mixture : Fire extinguishing agent, For professional and industrial installation end use only.

1.3. Details of the supplier of the safety data sheet

Company : Chemours Netherlands B.V.
Baanhoekweg 22
NL-3313 LA Dordrecht
Netherlands

Telephone : +31-(0)-78-630-1011

Telefax : +31-78-6163737

E-mail address : sds-support@chemours.com

1.4. Emergency telephone number

Emergency telephone number : +(44)-870-8200418 (CHEMTREC - Recommended)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Gases under pressure, Liquefied gas H280: Contains gas under pressure; may explode if heated.

Specific target organ toxicity - single exposure, Category 3 H336: May cause drowsiness or dizziness. (Central nervous system)

2.2. Label elements



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Warning

H280 Contains gas under pressure; may explode if heated.
H336 May cause drowsiness or dizziness.

Special labelling of certain substances and mixtures Contains: 1,1,1,3,3,3-Hexafluoropropane / Kyoto: Contains fluorinated greenhouse gas covered by the Kyoto Protocol.,HFC-236fa.,

P233 Keep container tightly closed.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Rapid evaporation of the liquid may cause frostbite.
May cause cardiac arrhythmia.

SECTION 3: Composition/information on ingredients

3.1. Substances

Registration number	Classification according to Regulation (EU) 1272/2008 (CLP)	Concentration (% w/w)
1,1,1,3,3,3-Hexafluoropropane (CAS-No.690-39-1) (EC-No.425-320-1)		
01-0000017172-78-0000	STOT SE 3; H336 Press. Gas Liquefied gas; H280	>= 99 %

3.2. Mixtures

Not applicable

The above products are compliant to REACH registration obligations; Registration number(s) may not be provided because substance(s) are exempted, not yet registered under REACH or are registered under another regulatory process (biocide uses, plant protection products), etc.



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For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

- General advice : Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.
- Inhalation : Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.
- Skin contact : Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.
- Eye contact : In case of eye contact
: Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Ingestion : Is not considered a potential route of exposure.

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

- Symptoms : Skin contact may provoke the following symptoms:, Frostbite, Inhalation may provoke the following symptoms:, Shortness of breath, Dizziness, Weakness, Nausea, Headache, narcosis, Irregular cardiac activity

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

- Treatment : Do not give adrenaline or similar drugs. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : This material is a fire extinguishing agent., Use extinguishing measures that are appropriate to local circumstances and the surrounding environment., such as, Water spray, Foam, Dry chemical, Carbon dioxide (CO₂)

5.2. Special hazards arising from the substance or mixture

- Specific hazards during firefighting : Fire or intense heat may cause violent rupture of packages.
: Hazardous thermal decomposition products: Carbon oxides Hydrogen fluoride



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Carbonyl fluoride Fluorocarbons
: Exposure to decomposition products may be a hazard to health.

5.3. Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire.

Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Cool containers/tanks with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. Refer to protective measures listed in sections 7 and 8.

6.2. Environmental precautions

Environmental precautions : Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up

Methods for cleaning up : Evaporates.

6.4. Reference to other sections

For disposal instructions see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling : Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8.

Advice on protection against fire and explosion : No special protective measures against fire required.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Do not drag, slide or roll cylinders. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Keep at temperature not exceeding 52°C. Keep containers tightly closed in a dry, cool and well-ventilated place. Store in original container.



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Protect from contamination.

Advice on common storage : No materials to be especially mentioned.

Storage period : > 10 yr

Storage temperature : < 52 °C

Other data : The product has an indefinite shelf life when stored properly.

7.3. Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

If sub-section is empty then no values are applicable.

Derived No Effect Level (DNEL)

- 1,1,1,3,3,3-Hexafluoropropane : Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Acute - systemic effects
Value: 61147 mg/m³
: Type of Application (Use): Consumer use
Exposure routes: Inhalation
Health Effect: Chronic effects, Systemic effects
Value: 1240 mg/m³
: Type of Application (Use): Workers
Exposure routes: Inhalation
Health Effect: Chronic effects, Systemic effects
Value: 4984 mg/m³

Predicted No Effect Concentration (PNEC)

- 1,1,1,3,3,3-Hexafluoropropane : Value: 0.186 mg/l
Compartment: Fresh water
: Value: 0.019 mg/l
Compartment: Marine water
: Value: 1.86 mg/l
Compartment: Water
Remarks: Intermittent use/release



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: Value: 0.065 mg/kg dry weight (d.w.)
Compartment: Soil

: Value: 0.092 mg/kg dry weight (d.w.)
Compartment: Marine sediment

: Value: 0.915 mg/kg dry weight (d.w.)
Compartment: Fresh water sediment

8.2. Exposure controls

Engineering measures : Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released.

Eye protection : Safety glasses with side-shields Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

Hand protection : Material: Heat insulating gloves

Skin and body protection : Impervious clothing

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

Respiratory protection : For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Form : Liquefied gas

Colour : colourless

Odour : slight, ether-like

Freezing point : -103 °C at 1,013 hPa

Boiling point : -2 °C at 1,013 hPa

Flammability (solid, gas) : The product is not flammable.

Explosive properties : Not explosive

Lower explosion limit/ lower flammability limit : Not applicable



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Upper explosion limit/ upper flammability limit	: Not applicable
Vapour pressure	: 2,490 hPa at 22 °C
Density	: 0.0061 - 0.0062 g/cm ³ at 22.4 °C
Water solubility	: 0.724 g/l at 20 °C
Partition coefficient: n-octanol/water	: log Pow: 1.12 at 20 °C, (calculated)
Relative vapour density	: 6.18 at 20 °C

9.2. Other information

no data available

SECTION 10: Stability and reactivity

10.1. Reactivity	: Decomposes on heating.
10.2. Chemical stability	: The product is chemically stable.
10.3. Possibility of hazardous reactions	: Stable at normal temperatures and storage conditions.
10.4. Conditions to avoid	: The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.
10.5. Incompatible materials	: Alkali metals Alkaline earth metals Powdered metals Powdered metal salts
10.6. Hazardous decomposition products	: Hazardous thermal decomposition products may include: Carbon oxides Hydrogen fluoride Carbonyl fluoride Fluorocarbons

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute inhalation toxicity



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- 1,1,1,3,3,3-Hexafluoropropane
LC50 / 4 h Rat :> 457000 ppm

LC50 / 4 h Rat :> 189000 ppm
Narcotic effects Central nervous system effects

Low Observed Adverse Effect Concentration (LOAEC) / Dog :150000 ppm
Cardiac sensitization

No Observed Adverse Effect Concentration / Dog :100000 ppm
Cardiac sensitization

Skin irritation

- 1,1,1,3,3,3-Hexafluoropropane
Not tested on animals
Classification: Not classified as irritant
Result: No skin irritation
Not expected to cause skin irritation based on expert review of the properties of the substance.

Eye irritation

- 1,1,1,3,3,3-Hexafluoropropane
Not tested on animals
Classification: Not classified as irritant
Result: No eye irritation
Not expected to cause eye irritation based on expert review of the properties of the substance.

Sensitisation

- 1,1,1,3,3,3-Hexafluoropropane
Not tested on animals
Classification: Not a skin sensitizer.
Result: Does not cause skin sensitisation.
Not expected to cause sensitization based on expert review of the properties of the substance.

There are no reports of human respiratory sensitization.

Repeated dose toxicity

- 1,1,1,3,3,3-Hexafluoropropane
Inhalation Rat
No toxicologically significant effects were found.

Mutagenicity assessment

- 1,1,1,3,3,3-Hexafluoropropane
Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects.



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Toxicity to reproduction assessment

- 1,1,1,3,3,3-Hexafluoropropane
No toxicity to reproduction Evidence suggests the substance is not a reproductive toxin in animals.

Assessment teratogenicity

- 1,1,1,3,3,3-Hexafluoropropane
Animal testing showed no developmental toxicity.

Human experience

Excessive exposures may affect human health, as follows:

Inhalation

Severe shortness of breath, narcosis, Irregular cardiac activity

Further information

Rapid evaporation of the liquid may cause frostbite. Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema).

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish

- 1,1,1,3,3,3-Hexafluoropropane
LC50 / 96 h / Zebra fish: 292 mg/l

Toxicity to aquatic plants

- 1,1,1,3,3,3-Hexafluoropropane
ErC50 / 96 h / Pseudokirchneriella subcapitata (microalgae): > 186 mg/l

Toxicity to aquatic invertebrates

- 1,1,1,3,3,3-Hexafluoropropane
EC50 / 48 h / Daphnia magna (Water flea): 299 mg/l

12.2. Persistence and degradability

Biodegradability

/ 28 d

Biodegradation: 16 %

According to the results of tests of biodegradability this product is not readily biodegradable.



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- 1,1,1,3,3,3-Hexafluoropropane
Not biodegradable

12.3. Bioaccumulative potential

no data available

12.4. Mobility in soil

no data available

12.5. Results of PBT and vPvB assessment

PBT and vPvB assessment

This substance is not considered to be persistent, bioaccumulating and toxic (PBT). / This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6. Other adverse effects

Ozone depletion potential

0

Global warming potential (GWP)

9810

Additional ecological information

IPCC - AR4 (Fourth Assessment Report of the Intergovernmental Panel on Climate Change) - 2007

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product : Can be used after re-conditioning. In accordance with local and national regulations.

Contaminated packaging : Empty pressure vessels should be returned to the supplier.

SECTION 14: Transport information

ADR

- | | |
|-------------------------------------|---|
| 14.1. UN number: | 3163 |
| 14.2. UN proper shipping name: | LIQUEFIED GAS, N.O.S. (1,1,1,3,3,3-Hexafluoropropane) |
| 14.3. Transport hazard class(es): | 2 |
| 14.4. Packing group: | Not applicable |
| 14.5. Environmental hazards: | For further information see Section 12. |
| 14.6. Special precautions for user: | |
| Tunnel restriction code: | (C/E) |



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IATA_C

- | | |
|-------------------------------------|---|
| 14.1. UN number: | 3163 |
| 14.2. UN proper shipping name: | Liquefied gas, n.o.s. (1,1,1,3,3,3-Hexafluoropropane) |
| 14.3. Transport hazard class(es): | 2.2 |
| 14.4. Packing group: | Not applicable |
| 14.5. Environmental hazards : | For further information see Section 12. |
| 14.6. Special precautions for user: | no data available |

IMDG

- | | |
|-------------------------------------|---|
| 14.1. UN number: | 3163 |
| 14.2. UN proper shipping name: | LIQUEFIED GAS, N.O.S. (1,1,1,3,3,3-Hexafluoropropane) |
| 14.3. Transport hazard class(es): | 2.2 |
| 14.4. Packing group: | Not applicable |
| 14.5. Environmental hazards : | For further information see Section 12. |
| 14.6. Special precautions for user: | no data available |

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

Not applicable

SECTION 15: Regulatory information

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

Other regulations : Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.

15.2. Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.
An Exposure Scenario (ES) is not required.

SECTION 16: Other information

Full text of H-Statements referred to under section 3.

H280	Contains gas under pressure; may explode if heated.
H336	May cause drowsiness or dizziness.

Abbreviations and acronyms

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute toxicity estimate
CAS-No.	Chemical Abstracts Service number
CLP	Classification, Labelling and Packaging
EbC50	Concentration at which 50% reduction of biomass is observed
EC50	Median effective concentration



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EN	European Norm
EPA	Environmental Protection Agency
ErC50	Concentration at which a 50% inhibition of growth rate is observed
EyC50	Concentration at which 50 % inhibition of yield is observed
IATA_C	International Air Transport Association (Cargo)
IBC	International Bulk Chemical Code
ICAO	International Civil Aviation Organization
ISO	International Standard Organization
IMDG	International Maritime Dangerous Goods
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LOEC	Lowest Observed Effect Concentration
LOEL	Lowest observed effect level
MARPOL	International Convention for the Prevention of Marine Pollution from Ships
n.o.s.	Not Otherwise Specified
NOAEC	No Observed Adverse Effect Concentration
NOAEL	No observed adverse effect level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
OECD	Organisation for Economic Co-operation and Development
OPPTS	Office of Prevention, Pesticides and Toxic Substances
PBT	Persistent, Bioaccumulative and Toxic
STEL	Short term exposure limit
TWA	Time Weighted Average (TWA):
vPvB	very Persistent and very Bioaccumulative

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