

Safety Data Sheet

FM-200™

Revision Date: 23 September 2021

1. PRODUCT AND COMPANY IDENTIFICATION

Product name: FM-200™
Use of Substance/Mixture: Firefighting agent
Importer / Supplier: Fire Protection Technologies
Address: Unit 1/251 Ferntree Gully Road
 Mt Waverley, Victoria, 3149 Australia.
Telephone Number: 1300 742 296
Emergency Telephone No.: 24 hours 1300 742 296
Emergency Services: Dial 000
SDS Preparer: Fire Protection Technologies

2. HAZARDS IDENTIFICATION

2.1 Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

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

2.2 Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720 and UK SI 2020/1567)

Hazard pictograms :



Signal Word : Warning
 Hazard Statements : H280 Contains gas under pressure; may explode if heated.
 Precautionary Statements : **Storage:**
 P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Additional Labelling

Contains fluorinated greenhouse gases (HFC-227 ea)

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative v(PvB) at levels of 0.1% or higher.
 Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.
 Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.
 Rapid evaporation of the product may cause frostbite.
 May displace oxygen and cause rapid suffocation.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Substance name : 1,1,1,2,3,3,3-Heptafluoropropane
 EC-No. : 207-079-2

Components

Chemical name	CAS-No. EC-No.	Concentration (% w/w)
1,1,1,2,3,3,3-Heptafluoropropane	431-89-0 207-079-2	>= 99.9 - <= 100

4. FIRST-AID MEASURES

4.1 Description of First Aid Measures

- General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.
- Protection of first-aiders : No special precautions are necessary for first aid responders
- If inhaled : If inhaled, remove to fresh air.
If not breathing, give artificial respiration.
If breathing is difficult, give oxygen.
Get medical attention immediately.
- In case of skin contact : Thaw frosted parts with lukewarm water. Do not rub affected area.
Get medical attention immediately.
- In case of eye contact : Get medical attention immediately.
- If swallowed : Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

- Risk : May cause cardiac arrhythmia.
Other symptoms potentially related to misuse or inhalation abuse are
Cardiac sensitization
Anaesthetic effects
Light-headedness
Dizziness
confusion
Lack of coordination
Drowsiness
Unconsciousness
- Risk : Gas reduces oxygen available for breathing.
Contact with liquid or refrigerated gas can cause cold burns and frostbite.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Because of possible disturbances of cardiac rhythm, cate-cholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

- Suitable extinguishing media : Not applicable
Will not burn
- Unsuitable extinguishing media : Not applicable
Will not burn

5.2 Special Hazards arising from the Substance or Mixture

- Specific hazards during fire fighting : Exposure to combustion products may be a hazard to health. If the temperature rises there is danger of the vessels bursting due to the high vapor pressure.
- Hazardous combustion products : No hazardous combustion products are known

5.3 Advice for Firefighters



- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fight fire remotely due to the risk of explosion.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.
- Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.
Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Personal precautions : Evacuate personnel to safe areas.
Avoid skin contact with leaking liquid (danger of frostbite).
Ventilate the area.
Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

- Environmental precautions : Avoid release to the environment
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.

6.3 Methods and material for containment and cleaning up

- Methods for cleaning up : Ventilate the area.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

- Technical measures : Use equipment rated for cylinder pressure. Use a backflow preventative device in piping. Close valve after each use and when empty.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Avoid breathing gas.
Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure assessment
Wear cold insulating gloves/ face shield/ eye protection.
Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point.
Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.
Prevent backflow into the gas tank.
Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.
Close valve after each use and when empty. Do NOT change or force fit connections.
Prevent the intrusion of water into the gas tank.
Never attempt to lift cylinder by its cap.
Do not drag, slide or roll cylinders.
Use a suitable hand truck for cylinder movement.
Keep away from heat and sources of ignition.
Take precautionary measures against static discharges.
Take care to prevent spills, waste and minimize release to the environment.

Hygiene measures : If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the working place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Do not store near combustible materials. Avoid area where salt or other corrosive materials are present. Keep in properly labeled containers. Keep in a cool, well-ventilated place. Keep away from direct sunlight. Store in accordance with the particular national regulations.

Advice on common storage : Do not store with the following product types:
 Self-reactive substances and mixtures
 Organic peroxides
 Oxidizing agents
 Flammable liquids
 Flammable solids
 Pyrophoric liquids
 Pyrophoric solids
 Self-heating substances and mixtures
 Substances and mixtures which in contact with water emit flammable gases
 Explosives
 Acutely toxic substances and mixtures
 Substances and mixtures with chronic toxicity

Recommended storage temperature : < 52 °C

Storage period : > 10 yr

Further information on storage stability : The product has an indefinite shelf life when stored properly.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL):

Substance Name	End Use	Exposure Routes	Potential Health Effects	Value
1,1,1,2,3,3,3- Heptafluoropropane	Workers	Inhalation	Long-term systemic effects	61279 mg/m ³
	Consumers	Inhalation	Long-term systemic effects	6533 mg/m ³

Predicted No Effect Concentration (PNEC):

Substance Name	Environmental Compartment	Value
1,1,1,2,3,3,3- Heptafluoropropane	Fresh Water	0.1 mg/l
	Intermittent use/release	1 mg/l
	Fresh Water Sediment	1.3 mg/kg dry weight (d.w.)
	Sewage Treatment Plant	1.73 mg/kg dry weight (d.w.)

8.2 Exposure Controls

Engineering measures : Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations.

Personal Protective Equipment

Eye protection	:	Wear the following personal protective equipment: Chemical resistant goggles must be worn. Face-shield Equipment should conform to BS EN 166
Hand protection material	:	Low temperature resistant gloves
Remarks	:	Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often!
Skin and body protection	:	Skin should be washed after contact.
Respiratory protection	:	If adequate local exhaust ventilation is not available or exposure assessment demonstrates exposures outside the recommended guidelines, use respiratory protection. Equipment should conform to BS EN 14387.
Filter type	:	Organic gas and low boiling vapour type (AX)
Protective measures	:	Wear cold insulating gloves / face shield / eye protection

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	:	Liquefied gas
Color	:	colorless
Odor	:	slight, ether-like
Odor Threshold	:	No data available
pH	:	No data available
Melting point/freezing point	:	-129.5 °C
Initial boiling point and boiling range	:	-17 °C (1,013 hPa)
Flash point	:	Not applicable
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Will not burn
Upper explosion limit / Upper flammability limit	:	Upper flammability limit Method: ASTM E681 None.
Lower explosion limit / Lower flammability limit	:	Lower flammability limit Method: ASTM E681 None.
Vapor pressure	:	4.547 hPa (25 °C) 540 hPa (-30 °C) 29,360 hPa (123 °C)
Relative vapor density	:	5.87
Density	:	1.388 g/cm ³ (25 °C) (as liquid)
Solubility(ies)		
Water solubility	:	0.23 g/l (25 °C)
Partition coefficient: n-octanol/water	:	log Pow: 2.289
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		
Viscosity, kinematic	:	Not applicable
Explosive properties	:	Not explosive
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Particle size	:	Not applicable

10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.
Possibility of hazardous reactions	:	Can react with strong oxidizing agents.
Conditions to avoid	:	This substance is not flammable in air temperatures up to 100°C (212°F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes.
Materials to avoid	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
Skin
contact
Eye
contact

Acute toxicity

Not classified based on available information.

Ingredients:

1,1,1,2,3,3,3-Heptafluoropropane:

Acute oral toxicity	:	Assessment: The substance or mixture has no acute oral toxicity
Acute inhalation toxicity	:	LC50 (Rat): > 788696 ppm Exposure time: 4 h Test atmosphere: gas Method: OECD Test Guideline 403 No observed adverse effect concentration (Dog): 35000 ppm Test atmosphere: gas Lowest observed adverse effect concentration (Dog): 90000 ppm Test atmosphere: gas Cardiac sensitisation threshold limit (Dog): 625,877 mg/m ³ Test atmosphere: gas
Acute dermal toxicity	:	Assessment: The substance or mixture has no acute dermal toxicity

Skin corrosion/irritation

Not classified based on available information.

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Result : No skin irritation

Serious eye damage/eye irritation

Not classified based on available information.

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Result : No eye irritation

Respiratory or skin sensitization

Skin sensitization

Not classified based on available information.

Respiratory sensitization

Not classified based on available information.

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Exposure routes : Skin contact

Result : Negative

Exposure routes : Inhalation

Result : Negative

Germ cell mutagenicity

Not classified based on available information.

Ingredients:

1,1,1,2,3,3,3-Heptafluoropropane:

Genotoxicity in vitro : Test Type: Bacterial reverse mutation assay (AMES)
Method: OECD Test Guideline 471
Result: Negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473
Result: Negative

Test Type: In vitro mammalian cell gene mutation test
Method: OECD Test Guideline 476
Result: Negative

Genotoxicity in vivo : Test Type: Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay)
Species: Mouse
Application Route: inhalation (gas)
Method: OECD Test Guideline 474
Result: Negative

Germ cell mutagenicity - Assessment : Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Effects on fertility : Test Type: One-generation reproduction toxicity study
Species: Rat
Application Route: inhalation (vapour)
Method: OECD Test Guideline 415
Result: negative
Remarks: Based on data from similar materials

Effects on foetal development : Test Type: Prenatal development toxicity study (teratogenicity)
Species: Rat
Application Route: inhalation (gas)
Method: OECD Test Guideline 414
Result: Negative
Test Type: Prenatal development toxicity study (teratogenicity)
Species: Rabbit
Application Route: inhalation (gas)
Method: OECD Test Guideline 414
Result: Negative

Reproductive toxicity – Assessment : Weight of evidence does not support classification for reproductive toxicity

STOT – single exposure

Not classified based on available information

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Exposure routes : inhalation (gas)
 Assessment : no significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less.

Repeated dose toxicity

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Species : Rat, male and female
 NOAEL : 105000 ppm
 LOAEL : >105000 ppm
 Application Route : inhalation (gas)
 Exposure time : 90 Days
 Method : OECD Test Guideline 413

Aspiration toxicity

Not classified based on available information.

12. ECOLOGICAL INFORMAITON

12.1 Toxicity

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Toxicity to fish : LC50 (Fish): > 100 mg/l
 Exposure time: 96 h
 Method: OECD Test Guideline 203
 Remarks: Based on data from similar materials

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
 Exposure time: 48 h
 Method: OECD Test Guideline 202
 Remarks: Based on data from similar materials

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): > 114 mg/l
 Exposure time: 72 h
 Method: OECD Test Guideline 201
 Remarks: Based on data from similar materials
 NOEC (Pseudokirchneriella subcapitata (green algae)): 13.2 mg/l
 Exposure time: 3 d
 Method: OECD Test Guideline 201
 Remarks: Based on data from similar materials

12.2 Persistence and degradability

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Biodegradability : Result: Not readily biodegradable.
 Method: OECD Test Guideline 301D

12.3 Bioaccumulative potential

Components:

1,1,1,2,3,3,3-Heptafluoropropane:

Partition coefficient: n-octanol/water : log Pow: 2.289

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects

Global warming potential

Regulation (EU) No 517/2014 on fluorinated greenhouse gases

Product:

100 year global warming potential : 3,220

13. DISPOSAL CONSIDERATION

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
Empty pressure vessels should be returned to the supplier. If not otherwise specified: Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN number

ADN : UN 3296
ADR : UN 3296
RID : UN 3296
IMDG : UN 3296
IATA : UN 3296

14.2 UN proper shipping name

ADN : HEPTAFLUOROPROPANE
ADR : HEPTAFLUOROPROPANE
RID : HEPTAFLUOROPROPANE
IMDG : HEPTAFLUOROPROPANE
IATA : HEPTAFLUOROPROPANE

14.3 Transport Hazard Class(es)

ADN : 2
ADR : 2
RID : 2
IMDG : 2.2
IATA : 2.2

14.4 Packing Group

ADN
Packing Group : Not assigned by regulation
Classification Code : 2A
Hazard Identification Number : 20
Labels : 2.2

ADR
Packing Group : Not assigned by regulation
Classification Code : 2A
Hazard Identification Number : 20
Labels : 2.2
Tunnel Restriction Code : (C/E)

RID
Packing Group : Not assigned by regulation
Classification Code : 2A
Hazard Identification Number : 20

Labels	:	2.2 ((13))
IMDG		
Packing Group	:	Not assigned by regulation
Labels	:	2.2
EmS Code	:	F-C, S-V
IMDG		
Packing Group	:	Not assigned by regulation
Labels	:	2.2
EmS Code	:	F-C, S-V
IATA (Cargo)		
Packing Instruction (cargo aircraft)	:	200
Packing Group	:	Not assigned by regulation
Labels	:	Non-flammable, non-toxic Gas
IATA (Passenger)		
Packing Instruction (passenger aircraft)	:	200
Packing Group	:	Not assigned by regulation
Labels	:	Non-flammable, non-toxic Gas

14.5 Environmental Hazards

ADN		
Environmentally Hazardous	:	No
ADR		
Environmentally Hazardous	:	No
RID		
Environmentally Hazardous	:	No
IMDG		
Environmentally Hazardous	:	No

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

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

Remarks : Not applicable for product as supplied.

15. REGULATORY INFORMATION

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

Relevant EU provisions transposed through retained EU law

REACH – Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)	:	Not applicable
REACH – Candidate List of Substances of Very High Concern for Authorisation (Article 59)	:	Not applicable
Regulation (EC) No 1005/2009 on substances that deplete the ozone layer	:	Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	:	Not applicable
Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals	:	Not applicable
UK REACH List of substances subject to authorization (Annex XIV)	:	Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances	:	Not applicable

15.2 Chemical Safety Assessment

A chemical safety assessment has been carried out for this substance



16. OTHER INFORMATION

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For further information contact the local Chemours office or nominated distributors.