

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**Product identifier**

Product name Fire suppression clean agent FFT 1230 (FK-5-1-12)
Chemical name 1,1,1,2,2,4,5,5,5- Nonafluoro-4-(Trifluoromethyl)-3-Pentanone
CAS No 756-13-8
REACH registration number 01-2120426966-44-XXXX

Other means of identification

Synonym Dodecafluoro-2-methyl-3-pentanone/Perfluoro(2-methyl-3-pentanone)

Recommended use of the chemical and restrictions on use

Recommended use Extinguishing agents, cleaning agents, solvents, heat transfer/cooling
Uses advised against liquid No information available

Details of the supplier of the safety data sheet

Supplier Fire Fluid Technologies MHX Ltd
Address Wuzhong, Suzhou, Jiangsu
Postal code 215159
Phone 0512-68560159
E-mail rory@firefluids.com

Emergency telephone number

0512-68560159

2. HAZARDS IDENTIFICATION

This SDS covers the product listed above as sold in pressurized and non-pressurized containers. GHS classifications are listed below for both forms.

GHS Classification - Pressurized**Classification of the substance or mixture**

Hazardous to the aquatic environment, long-term (chronic) Category 3
Gas under pressure - Compressed gas

Label elements

Hazard Symbols

**Signal word**

Warning

Hazard statements

H412 - Harmful to aquatic life with long lasting effects
Contents under pressure; may explode if heated.

Precautionary statements

P273 - Avoid release to the environment
P501 - Dispose of contents/container in accordance with local regulation.

Other hazards

No information available

GHS Classification - Unpressurized**Classification of the substance or mixture**

Hazardous to the aquatic environment, long-term (chronic) Category 3

Label elements

Hazard Symbols

None

Signal word

None

Hazard statements

H412 - Harmful to aquatic life with long lasting effects

Precautionary statements

P273 - Avoid release to the environment

P501 - Dispose of contents/container in accordance with local regulation.

Other hazards

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS**Description Substance**

Chemical name	CAS No	Weight-%
1,1,1,2,2,4,5,5,5- Nonafluoro-4-(Trifluoromethyl)-3- Pentanone	756-13-8	>=99.90

Note: Pressurized product uses nitrogen as the expellant.**4. FIRST AID MEASURES****Description of first aid measures**

General advice	Do not get in eyes, on skin, or on clothing. Do not breathe dust/fume/gas/mist/vapors/spray. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).
Inhalation	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Administer oxygen if breathing is difficult Get medical advice/attention if you feel unwell.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. If skin irritation persists, call a physician.
Eye contact	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
Ingestion	Not an expected route of exposure. If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

No information available.

Indication of any immediate medical attention and special treatment needed Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media The substance can be used as extinguishing agent. Wear suitable respiratory equipment to protect from harmful gases caused by thermal decomposition. Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating and toxic gases and vapors, such as carbon monoxide, carbon dioxide, hydrogen fluoride.

Protective equipment and precautions for firefighters

Evacuate personnel to safe areas. Move containers from fire area if you can do it without risk. Cool drums with water spray. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Stay upwind. Ensure adequate ventilation, especially in confined areas.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Remove all sources of ignition. Ensure adequate ventilation, especially in confined areas. Avoid contact with eyes and skin. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product Wash thoroughly after handling.

Environmental precautions

Local authorities should be advised if significant spillages cannot be contained. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid release to the environment

7. HANDLING AND STORAGE

Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, flame and other sources of ignition. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition. Keep locked up and out of reach of children. Keep away from food, drink and animal feeding stuffs. Store in accordance with local regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits

No data applicable

Appropriate engineering controls

Ensure adequate ventilation, especially in confined areas. Showers. Eyewash stations. Remove all sources of ignition.

Individual protection measures, such as personal protective equipment

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment
Hand protection	Wear protective gloves.
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin and body protection	Wear suitable protective clothing

9. PHYSICAL AND CHEMICAL PROPERTIES



Information on basic physical and chemical properties

Appearance	Liquid
Color	Colorless
Odor	Faint odor
Odor threshold	Not determined
PH	Not determined
Melting point/freezing point	-108.0 °C
Boiling point / boiling range	49.2 °C
Flammability (solid, gas)	Not flammable
Flammability limit in air	Not determined
Flash point	Not determined
Autoignition temperature	Not determined
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Solubility(ies)	Practically insoluble in water
Partition coefficient (LogPow)	Not determined
Vapor pressure	0.3260 bar (20 °C)
Density	1.60 g/mL
Relative density	Not determined
Vapor density	11.6
Evaporation rate	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

Other information

No information available

10. STABILITY AND REACTIVITY

Reactivity

No information available.

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Hazardous polymerization does not occur.

Conditions to avoid

No information available.

Incompatible materials

None known based on information supplied.

Hazardous decomposition products

Carbon monoxide, carbon dioxide, hydrogen fluoride.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Chemical name	Route	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Oral	Rat	LD50 > 2000 mg/kg
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Dermal	Rat	LD50 > 2000 mg/kg

1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	Rat(4 hours)	LC50 > 5000 mg/m ³
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Skin corrosion/irritation

Chemical name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	Non-irritating to the skin.

Serious eye damage/eye irritation

Chemical name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	No eye irritation

Sensitization

Chemical name	Species	Value
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	guinea pig	No sensitization responses were observed.

Germ cell mutagenicity (Mammalian Chromosome Aberration Test & Mammalian Cell Gene Mutation Test)

Chemical name	Route	Value (to somatic cell)
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	In Vitro	Not mutagenic

Carcinogenicity

No information available.

Reproductive toxicity

No information available.

STOT - single exposure

No information available.

STOT ■ repeated exposure (28-Day (Subacute) Inhalation Toxicity Study)

Chemical name	Route	Target organ	Species	Test result	Exposure duration
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation	liver kidney and/or bladder heart endocrine system hematopoietic system muscles nervous system respiratory system vascular system	Rat	NOAEL 3000000 mg/m ³ (6h/d, 5d/w)	28days

Aspiration hazard

No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Chemical name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50

3-Pentanone, 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)- (CAS #: 756-13-8)	10.6 mg/L 96h Pseudokirch neriella subcapitata	> 1 070 mg/L 96h Pimephales promelas	> 1 080 mg/L 48h Daphnia magna
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Persistence and degradability Not readily biodegradable.

Bioaccumulation
BCF = 1.2-4.8

Mobility
No information available.

Other adverse effects
No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/ unused products	Disposal should be in accordance with applicable regional, national and local laws and regulations.
Contaminated packaging	Disposal should be in accordance with applicable regional, national and local laws and regulations.
EU waste code (product as sold)	07 01 03* Organic halogenated solvents, washing liquids and other mother liquors 14 06 02* Other halogenated solvents and solvent mixtures

14. TRANSPORT INFORMATION

Safety Data Sheet information is intended to address a specific material and not various forms or states of containment.

Pressurized Containers

DOT CFR 172.101 Data Fire extinguishers, 2.2, UN1044

UN Proper Shipping Name Fire extinguishers

UN Class (2.2)

UN Number UN1044

UN Packaging Group Not applicable

Classification for AIR Consult current IATA Regulations prior to shipping by air.

Transportation (IATA)

Classification for Water Consult current IMDG Regulations prior to shipping by water.

Transport IMDG

Non-pressurized Containers

DOT CFR 172.101 Data Not Regulated

UN Proper Shipping Name Not Regulated

UN Class None.

UN Number None.

UN Packaging Group None.

Classification for AIR Consult current IATA Regulations prior to shipping by air.

Transportation (IATA)

Classification for Water Consult current IMDG Regulations prior to shipping by water.

Transport IMDG

This section is believed to be accurate at the time of preparation. It is not intended to be a complete statement or summary of the applicable laws, rules, or hazardous material regulations, and is subject to change. Users have the responsibility to confirm compliance with all laws, rules, and hazardous material regulations in effect at the time of shipping.

15. REGULATORY INFORMATION

International inventories

Component	AICS	DSUNDSL	EINECS/ ELINCS	ENCS	IECSC	KECL	PICCS	TSCA
3-Pentanone, 1,1,1,2,2,4,5,5,5-nonafluoro-4- (trifluoromethyl)- 756-13-8 (>=99)	X	X	X	X	X	X		X

Not Listed "X" Listed

16. OTHER INFORMATION

Key or legend to abbreviations and acronyms used in the safety data sheet

TWA - TWA (Time Weighted Average)

STEL - STEL (Short Term Exposure Limit)

Ceiling - Maximum limit value

TSCA - Toxic Substances Control Act Section 8(b) Inventory

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

IECSC - Chinese Inventory of Existing Chemical Substances

EINECS/ELINCS - European Inventory of Existing Commercial chemical Substances/European List of Notified Chemical Substances

ENCS - Japanese Existing and New Chemical Substances

KECL - Korea Existing Chemicals List

NZIoC - New Zealand Inventory of Chemicals

PICCS - The Philippine Inventory of Chemicals and Chemical Substances

AICS - The Australian Inventory of Chemical Substances

Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and



fire fluid
TECHNOLOGIES

Safety Data Sheet: FFT-1230™
According to UN GHS, Annex 4 - Guidance on the Preparation of SDS

is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of Safety Data Sheet