



# SAFETY DATA SHEET

## Section 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: FK-5-1-12 Fire Protection Fluid with Expellant  
 Other Identifiers: FK-5-1-12 with Expellant  
 Product Use: Fire Extinguishing Agent

Model Groups: Lv (Lv 500) Series\*: 1000lb, 900lb, 600lb  
 Mv (Mv 500) Series\*: 420lb, 250lb  
 Sv (Sv 500) Series\*: 130lb, 80lb, 40lb  
 (\*: Weights referenced in model groups are nominal reference descriptions of containers and not actual physical weights.)

Manufacturer: Rottguard Fire Systems Ltd  
 Internet Address: [www.rottguafire.ie](http://www.rottguafire.ie)  
 Address: Cullen, Co. Cork, Ireland. P51 EV20  
 Company Telephone: +353(0)29 76196  
 E-mail Address: rottguardfire@gmail.com  
 Emergency Contacts:  
 Issued: 20<sup>th</sup> March 2026

## Section 2. HAZARDS IDENTIFICATION

### GHS – Classification

Health	Environmental	Physical
Acute Toxicity- Category 5	None	None
Skin Corrosion/Irritation	None	None
Skin Sensitization: NO	None	None
Eye: 2B	None	Mild
Carcinogen: Category None	None	None

GHS – Label Symbol(s):

GHS – Signal Word(s): **Warning: Gas Under Pressure**

Other Hazards Not Resulting in Classification: Simple asphyxiant. May displace oxygen and cause rapid suffocation.  
 May cause frostbite if contact with skin or eyes.

## GHS – Hazard Phrases

GHS Hazard	GHS Codes(s)	Code Phrase(s)
Physical	H229	Pressurized container; may burst if heated.
Health	None	None
Environmental	H412	Harmful to aquatic life with long lasting effects.
<b>Precautionary:</b>		
General	P101 102	If medical advice is needed, have product container or label at hand. Keep out of reach of children.
Prevention	P251 273	Do not pierce or burn, even after use. Avoid release to the environment.
Response	P312 321 302+352 305+351+338  332+313 337+313	Call a doctor if you feel unwell. Specific treatment (see Section 4. First Aid Measures) IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. If skin irritation occurs: Get medical advice/attention. If eye irritation persists get medical advice/attention.
Storage	P410+403	Protect from sunlight. Store in well-ventilated place.
Disposal	P501	Dispose of contents through a licensed disposal company. Contaminated container should be disposed of as unused product.

## Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	EC No.	REACH Reg. No.	CAS-No.	Weight %
1,1,1,2,2,4,5,5,5- Nonafluoro-4-(trifluoromethyl)-3-pentanone (FK-5-1-12)	436-710-6	NA	756-13-8	>99.9

Note: Pressurized cylinder uses nitrogen as an expellant.

Emergency overview:

Clear liquid, low odor.

## Section 4. FIRST AID MEASURES

Eye Exposure:

Liquid or cold gas can cause freezing injury to eyes. Flush eyes with cool water for 15 minutes. Seek medical attention immediately.

Skin Exposure:

May cause cold burns or frostbite. Remove contaminated clothing and flush affected areas with lukewarm (NOT HOT) water. Seek medical attention immediately if blistering of the dermal surface or if deep tissue freezing occurs

Inhalation:

May cause coughing. If respiratory irritation or distress occurs, remove victim to fresh air. Seek medical attention if problems persists.

Ingestion:

None under normal conditions

Medical conditions possibly aggravated by exposure:

None

## Section 5. FIRE-FIGHTING MEASURES

Flammable Properties:	Not flammable
Flash Point:	None
Suitable Extinguishing Media:	Non-combustible. Use extinguishing media suitable for surrounding conditions.
Hazardous Combustion Products:	Main decomposition product is hydrogen fluoride in fire situations. Byproducts are irritating and potentially toxic. Pressurized container can explode in heat of fire
<u>Explosion Data:</u>	
Sensitivity to Mechanical Impact:	Not sensitive
Sensitivity to Static Discharge:	Not sensitive
Unusual fire/explosion hazards:	Pressurized container can explode in heat of fire
Protective Equipment and Precautions for Firefighters:	As in any fire, wear self-contained breathing apparatus in pressure-demand, NIOSH approved or equivalent and full protective gear.

## Section 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Monitor oxygen level.
Personal Protective Equipment:	None unless there is a chance of direct contact with the chemical. Wear self-contained breathing apparatus when entering area unless atmosphere is proved safe. Wear appropriate PPE for the situation.
Emergency Procedures:	Handle in accordance with good health and safety practices.
Methods for Containment:	Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest supplier location.
Methods for Clean Up:	Return cylinder to authorized distributor.
Environmental Precautions:	Prevent spreading of vapors through sewers, ventilation systems and confined areas.
Other:	If product is contaminated, use PPE and containment appropriate to the nature of the most toxic chemical/material in the mixture.

## Section 7. HANDLING AND STORAGE

### Personal Precautions:

Put on appropriate personal protective equipment. Contains gas under pressure. Do not get in eyes, on skin or clothing. Avoid breathing gas. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

### Conditions for Safe Storage/Handling:

Protect from sunlight and store in a well-ventilated place. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use suitable equipment for cylinder movement. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating area.

## Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	CAS NO.	OSHA PEL
1,1,1,2,2,4,5,5,5- Nonafluoro-4-(trifluoromethyl)-3-pentanone	756-13-8	TWA: 150 ppm (1,940 mg/m <sup>3</sup> )

Value is an 8 hour time weighted average concentration.

### Engineering Controls

Provide appropriate local exhaust when product is heated. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant exposure Limits and/or control fumes/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

### Personal Protective Equipment (PPE)

#### **Eye/face protection**

Eye protection recommended when handling pressurized cylinders.

#### **Skin/hand protection**

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

Gloves made from the following material(s) are recommended: Neoprene

### Foot protection

Appropriate safety shoes are recommended when handling compress gas cylinders.

### Respiratory protection

During heating:

Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless liquid
Molecular Weight:	316.05
Odor:	Low odor
Odor Threshold:	No information available
Decomposition Temperature °C:	No information available
Freezing/Melting Point °C:	-108°C
Initial Boiling Point °C:	49°C at 1 atm
Physical State:	Liquid
pH:	Not applicable
Flash Point °C:	None
Auto-ignition Temperature °C:	Not applicable
Flammability:	Not Flammable
Flammability Limits in Air °C:	Upper – Not Flammable; Lower-Not Flammable
Explosivity	Upper – Not Explosive; Lower-Not Explosive
Volatile Organic Compounds	1600 g/L
Percent Volatile	100%
Evaporation Rate:	>1
Vapor Density:	11.6 (AIR=1)
Vapor Pressure:	0.404 bar @ 25°C
Specific gravity at 25°C:	1.6
Solubility:	40.95 mg/L @ 25°C
Partition Coefficient: octanol/air	8.3E-012
Viscosity:	0.6 centipoise @ 25°C

## Section 10. STABILITY AND REACTIVITY

Stability:	Stable under recommended storage and handling conditions.
------------	---

Reactivity: This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

Incompatibles: Strong bases, amines, alcohols, water

Conditions to Avoid: Storage or handling near incompatibles, heat, sunlight. Pressurized containers may rupture or explode if exposed to heat.

Hazardous Decomposition Products: Heat of fire or elevated temperatures may release hydrogen fluoride and perfluoroisobutylene.

Possibility of Hazardous Reactions: Slight

Hazardous Polymerization: Will not occur

**Section 11. TOXICOLOGICAL INFORMATION**

Likely Routes of Exposure: Inhalation, skin, and eye contact.

Symptoms:

Immediate:

Inhalation: No known health effects

Eyes: Normally does not cause significant irritation

Skin: Normally does not cause significant irritation

Delayed: Normally does not have a delayed reaction

Acute Toxicity: Relatively non-toxic.

Chronic Toxicity:

Short-term Exposure: None known.

Long-term Exposure: None known

**Acute Toxicity Values - Health**

Chemical Name	LD50		LC50 (Inhalation)
	Oral	Dermal	
1,1,1,2,2,4,5,5,5- Nonafluoro-4-(trifluoromethyl)-3-pentanone	>2000 mg/kg (rat)	>2000 mg/kg (rat)	1,227 mg/m <sup>3</sup> (rat)

Reproductive Toxicity: This product's ingredients are not known to have reproductive or teratogenic effects.

Target Organs and Effects (TOST): This product is not known to have any single exposure target organ toxicities. Some data exists concerning impacts on liver, kidney, bladder, but the data are not sufficient for classification; all other potential organ impacts are not apparent.

## Other Toxicity Categories

Chemical Name	Germ Cell Mutagenicity	Carcinogenicity	Reproductive	Aspiration
1,1,1,2,2,4,5,5,5- Nonafluoro-4-(trifluoromethyl)-3-pentanone	Not a hazard	Not considered carcinogenic	Not considered a hazard	Not a hazard

Note: Nitrogen, the expellant when in a pressurized container, is a simple asphyxiant.

## Section 12. ECOLOGICAL INFORMATION

Ecotoxicity:	Harmful to aquatic life with long lasting impacts
Persistence/Degradability:	Insoluble in water; Photolytic half-life 3-5 days
Probability of rapid biodegradation:	Est: -1.325 (Slow)
Anaerobic biodegradation probability:	Est: 0.2243 (Slow)
Bioaccumulation potential:	63.04 L/kg (Low)
Bioconcentration factor:	63.02 L/kg (wet-wt) (Low BFC)
Mobility in soil:	Highly insoluble in water
Log Koc (Kow Method):	Est: 2.66
Log Koa:	Est: 1.529
Log Kow:	Est 2.79

### Ecotoxicological Information - 1,1,1,2,2,4,5,5,5- Nonafluoro-4-(trifluoromethyl)-3-pentanone

Test Organism	Acute (LC50)	EC50
Green algae, <i>Selenastrum capricornutum</i>	N/A	7.7 mg/L (72 hours)
Zebra Fish, <i>Brachydanio rerio</i>	>1200 mg/L (96 hours)	NA
Water flea, <i>Daphnia magna</i>	NA	>1200 mg/L (48 hours)
Green algae, <i>Selenastrum capricornutum</i>	NA	1.2 mg/L (72 hours, No obs EC)

## Section 13. DISPOSAL CONSIDERATIONS

Safe Handling	Use appropriate PPE when handling, and wash thoroughly after handling (see Section 8).
Waste Disposal Considerations	Dispose in accordance with federal, state, and local regulations.
Contaminated Packaging	Dispose in accordance with federal, state, and local regulations. Use a leak-proof container

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

### NOTES:

This product is not a RCRA characteristically hazardous or listed hazardous waste.

## Section 14a. TRANSPORT INFORMATION

Applies to Model groups:

Lv (Lv 500) Series: 1000lb, 900lb, 600lb

Mv (Mv 500) Series: 420lb, 250lb

Sv (Sv 500) Series: 130lb, 80lb

*(Note: The following applies to all models except Sv Series 40lb. For information for Sv Series: 40lb see Section 14b. TRANSPORT INFORMATION)*

### International Regulations

#### IATA-DGR

UN/ID No.:

UN 1058

Proper shipping name:

Liquefied gases

Class :

2.2

Packing group:

Labels:

Non-flamm. gas

Packing instruction (cargo aircraft):

200

Packing instruction (passenger aircraft):

200

#### IMDG-Code

UN number:

UN 1058

Proper shipping name:

LIQUEFIED GASES

Class:

2.2

Packing group:

Labels:

2.2

EmS Code:

F-C, S-V

Marine pollutant:

No

### Domestic regulation

#### 49 CFR

UN/ID/NA number:

UN 1058

Proper shipping name:

Liquefied gases

Class:

2.2

Packing group:

ERG Code:

ERG No. 120

Marine pollutant:

No

## Section 14b. TRANSPORT INFORMATION

Applies to Model groups:

Sv (Sv 500) Series: 40lb

(Note: For information for all other model groups see Section **14a. TRANSPORT INFORMATION**)

### International Regulations

#### IATA-DGR

UN/ID No.:	UN 1044
Proper shipping name:	Fire Extinguishers
Class :	2.2
Packing group:	
Labels:	Non-flamm. gas
Packing instruction (cargo aircraft):	213
Packing instruction (passenger aircraft):	213

#### IMDG-Code

UN number:	UN 1044
Proper shipping name:	Fire Extinguishers
Class:	2.2
Packing group:	
Labels:	2.2
EmS Code:	F-C, S-V
Marine pollutant:	No

### Domestic regulation

#### 49 CFR

UN/ID/NA number:	UN 1044
Proper shipping name:	Fire Extinguishers
Class:	2.2
Packing group:	
ERG Code:	ERG No. 126
Marine pollutant:	No

## Section 15. REGULATORY INFORMATION

**International Inventory Status:** All ingredients are on the following inventories

Country(ies)	Agency	Status
United States of America	TSCA	Yes
Canada	DSL	Yes
Europe	EINECS/ELINCS	Yes
Australia	AICS	Yes
Japan	MITI	Yes
South Korea	KECL	Does not comply

### **U.S. Federal Regulatory Information:**

**SARA Title III Sect 311/312 Categorization: Pressurized**  
Pressure Hazard

**SARA Title III Sect 311/312 Categorization: Non-pressurized**  
None

### **SARA Title III Sect 313**

This product does not contain any chemicals that are listed in Section 313 at or above de minimis concentrations.

### **Clean Water/Clean Air Acts:**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42) or Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61) and Section 112 of the Clean Air Act Amendments of 1990.

### **CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfunds Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, state, or provincial level.

### **U.S. State Regulatory Information:**

Chemicals in this product are covered under specific State regulations, as denoted below:

**Alaska** - Designated Toxic and Hazardous Substances: None

**California** – Permissible Exposure Limits for Chemical Contaminants: None

**Florida** – Substance List: None

**Illinois** – Toxic Substance List: None

**Kansas** – Section 302/303 List: None

**Massachusetts** – Substance List: None

**Minnesota** – List of Hazardous Substances: None

**Missouri** – Employer Information/Toxic Substance List: None  
**New Jersey** – Right to Know Hazardous Substance List: None  
**North Dakota** – List of Hazardous Chemicals, Reportable Quantities: None  
**Pennsylvania** – Hazardous Substance List: None  
**Rhode Island** – Hazardous Substance List: None  
**Texas** – Hazardous Substance List: None  
**West Virginia** – Hazardous Substance List: None  
**Wisconsin** – Toxic and Hazardous Substances: None  
**California Proposition 65**: No component is listed on the California Proposition 65 list.

**U.S. State Right-to-Know Regulations**

This product does not contain any substances regulated by state right-to-know regulations.

**Section 16. OTHER INFORMATION**

This SDS conforms to requirements under U.S., U.K., Canadian, Australian, and EU regulations or standards, and conforms to the 2003 ANSI Z400.1 format. No modifications of this SDS are authorized by Rottguard Fire Systems Ltd. Questions or comments should be directed to Rottguard Fire Systems Ltd (See Section 1).

Issuing Date	20-March-2026
Revision Date	None
Revision Notes	None