SAFETY DATA SHEET

SHTG-MSDS-HFC227		**Issue Date**	15-Jan-2019
Version	4.0	**Revision Date**	26-Oct-2023
Product Name	SHTG 227 (HFC-227ea)		
UL File no.	EX27856		

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

1.1. Product identifier

Product Name	SHTG 227 (HFC-227ea)
Chemical Name	1,1,1,2,3,3,3-heptafluoropropane
CAS NO	431-89-0
EC NO	207-079-2
REACH registration number	No information available

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

Recommended Use	Used as refrigerants, medical propellant; extinguishing agent, explosion-proof, flame retardants.
Uses advised against	No information available

1.3. Details of the supplier of the safety data sheet

Supplier	Safety Hi-Tech Global LLC
Address	16192 Coastal Highway, Lewes, Delaware, USA
ZIP	19958
Phone	+1 (302) 510-1465
E-mail	info@sht-global.com

1.4. Emergency telephone number

+ 1 (302) 510-1465

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Gases under pressure, Liquefied gas - (H280)

2.2. Label elements

Symbols/Pictograms



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

2.3. Other hazards

No information available.

SECTION 3: Composition/information on ingredients

3.1 Substance

Chemical Name	EC No	CAS No	Weight-%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Propane, 1,1,1,2,3,3,3-heptafluoro-	207-079-2	431-89-0	>=99.0	Liquefied gas H280

SECTION 4: First aid measures

4.1. 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.

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

No information available.

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

Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	No information available.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic gases and vapors, such as gaseous hydrogen fluoride and fluorophosgene.

5.3. Advice 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.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Remove all sources of ignition. Do not touch or walk through spilled material. Avoid contact with skin, eyes or clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Use personal protection recommended in Section 8.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

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

6.4. Reference to other sections

See Section 7 for more information. See section 8 for more information. See section 13 for more information.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes, or clothing. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink, or smoke when using this product. Wash thoroughly after handling. Use personal protection recommended in Section 8.

7.2. 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. Storage temperature: <52 °C. Keep locked up and out of reach of children. Keep only in original container. Keep away from food, drink, and animal feeding stuffs. Store in accordance with local regulations.

7.3. Specific end use(s)

Apart from the uses mentioned in SECTION 1.2 no other specific uses are stipulated.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Chemical Name	Latvia	France	Finland	Germany	Italy
Propane, 1,1,1,2,3,3,3-heptafluoro- (CAS #: 431-89-0)	TWA: 2 ppm TWA: 20 mg/m³	-	-	-	-

Derived No Effect Level (DNEL)

	Route	Type of effect	DNEL
For the worker	Inhalation	Systemic effects - Long-term	61279 mg/m³
For the general population	Inhalation	Systemic effects - Long-term	6355 mg/m³

Predicted No Effect Concentration (PNEC)

Compartment	PNEC
Water	Freshwater: 0.1 mg/L
	Intermittent releases: 1 mg/L
Sediment	Freshwater: 1.3 mg/kg sediment dw
STP	1.73 mg/L

8.2. Exposure controls

Engineering Controls

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

Personal protective equipment

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

Environmental exposure controls

Do not allow into any sewer, on the ground or into any body of water

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Gas
Color	Colorless
Odor	Odorless
Odor Threshold	Not determined
pH	Neutral
Melting point/freezing point	-131.0 °C
Boiling point / boiling range	-17 °C
Flash point	Not determined
Evaporation rate	Not determined
Flammability (gas)	Not flammable
Flammability Limit in Air	Not determined
Vapor Pressure	457.7 kPa (25 °C)
Vapor density	6.04
Density	1.46 g/cm³
Relative density	1.46
Bulk density	Not determined
Specific gravity	Not determined
Water solubility	260 mg/L (25 °C)
Partition coefficient (LogPow)	2.11
Autoignition temperature	532 °C
Decomposition temperature	Not determined
Kinematic viscosity	Not determined
Dynamic viscosity	Not determined
Explosive properties	Not an explosive
Oxidizing properties	Not determined

9.2. Other information

No information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Contact with strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.

10.2. Chemical stability

Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions

Hazardous polymerization does not occur.

10.4. Conditions to avoid
Heat, flames and sparks. Strong heating. Incompatible materials. Compressed air, oxygen, chlorine.

10.5. Incompatible materials
Light and/or alkaline metals, alkaline earth metals, powdered metals, oxidizing agents.

10.6. Hazardous decomposition products
Gaseous hydrogen fluoride (HF). Fluorophosgene.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Propane, 1,1,1,2,3,3,3-heptafluoro- (CAS #: 431-89-0)	-	-	> 788696 ppm 4h (Rat)

Skin corrosion/irritation
Non-irritating to the skin.

Serious eye damage/eye irritation
No eye irritation.

Sensitization
No sensitization responses were observed.

Germ cell mutagenicity
Genotoxicity: negative.

Carcinogenicity
No information available.

Reproductive toxicity
No information available.

STOT - single exposure
No information available

STOT - repeated exposure
No information available

Aspiration hazard
No information available.

SECTION 12: Ecological information

12.1. Toxicity

Chemical Name	Algae/aquatic plants EC50	Fish LC50	Crustacea EC50
Propane, 1,1,1,2,3,3,3-heptafluoro- (CAS #: 431-89-0)	> 114 mg/L 72h Pseudokirchnerella subcapitata	-	> 200 mg/L 48h Daphnia magna

12.2. Persistence and degradability
The test substance was not biodegradable by micro-organisms under the present test conditions.

12.3. Bioaccumulative potential
LogPow = 2.11

12.4. Mobility in soil
No information available

12.5. Results of PBT and vPvB assessment
PBT/vPvB assessment information is not available as chemical safety assessment not conducted.

12.6. Other adverse effects
No information available.

SECTION 13: Disposal considerations

13.1. 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.

SECTION 14: Transport information

14.1 UN Number	3296
14.2 Proper shipping name	HEPTAFLUOROPROPANE (Refrigerant GAS R 227)
14.3 Hazard Class	2.2
14.4 Packing Group	Not regulated
14.5 Environmental hazards	Non-marine pollutant
14.6 Special precautions	No information available
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable

SECTION 15: Regulatory information

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

European Union

Component	EINECS/ELINCS	SVHC candidates	RESTRICTIONS - REACH TITLE VII
Propane, 1,1,1,2,3,3,3-heptafluoro- 431-89-0 (>=99.0%)	X	-	-

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.

Take note of Directive 94/33/EC on the protection of young people at work.

Take note of Directive 92/85/EC on the protection of pregnant and breastfeeding women at work.

International Inventories

Component	TSCA	DSL/NDSL	ENCS	IECSC	KECL	PICCS	AICS
Propane, 1,1,1,2,3,3,3-heptafluoro- 431-89-0 (>=99.0%)	X	X	X	X	X	-	X

"-" Not Listed
"X" Listed

15.2. Chemical safety assessment

No information available

SECTION 16: Other information

This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Issue Date	15-Jan-2019
Revision date	18-Feb-2021
Revision date	22-Aug-2023
Revision Note	Update SDS preparation regulations and contents

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 - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Full text of H-Statements referred to under section 3

H280 - Contains gas under pressure; may explode if heated

Disclaimer

The information provided in this Material 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 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 --------