Complies with EC no. 1907/2006
Date of Issue: 06/01/2000
Date of Revision: 05/08/2015

Safety Data Sheet (SDS)

Section 1: Chemical Product and Company Identification

Cat# : 3511

Part Name: Flash Freeze

Supplier: **Decon Laboratories Inc.**
460 Glennie Circle King of Prussia, Pa 19406
SDS Telephone # (610) 755-0800

Emergency Telephone Numbers
US Chemtrec: (800) 424-9300
Canada: (703) 527-3887

Identified uses: Laboratory use

Email Contact: cveloski@deconlabs.com

Section 2: Hazards Identification:

Hazard Overview

Classification of the substance or mixture
Classification (GHS-US)
Compressed gas H280

Label elements

GHS-US labeling
Hazard pictograms (GHS-US)

Signal Word: WARNING

Hazard and Precautionary Statements

H280 Contains gas under pressure; may explode if heated
P410+P403 Protect from sunlight. Store in a well ventilated place
P251 Pressurized container. Do not pierce or burn, even after use.
P412 Do not expose to temperatures exceeding 50degrees C/122 degrees F

Other hazards not contributing to the classification : Contains gas under pressure; may explode if heated. Intentional misuse and inhalation abuse may cause cardiac or central nervous systems effects. Warning. May Cause frostbite in contact with skin.

Unknown acute toxicity(GHS-US)
No data available

NFPA Rating

Hazard Ratings:
These ratings are Decon Laboratories Inc.'s own assessments of the properties of the material using the ANSI/NFPA 704 Standard. Additional information can be found by consulting in the NFPA published ratings lists (List 325 and list 49).

If no data is listed the information is not available

Health 1 Flammability 0 Reactivity 1

Section 3: Composition/ Information on ingredients

Substances

Name	Product identifier	%	Classification (GHS-US)
1,1,1,2-tetrafluoroethane (Main constituent)	(CAS No)811-97-2	> 99	Compressed gas, H280

Full text of H-phrases: see section 16

Mixtures
Not applicable

Section 4: First Aid Measures

Description of first aid measures

First-aid measures general : Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.

First-aid measures after inhalation : Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

First-aid measures after skin contact : Rinse with water. Take victim to a doctor if irritation persists. In case of frostbites: Wash immediately with lots of water (15 minutes)/shower. Do not apply (chemical) neutralizing agents. Remove clothing while washing. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage. Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

First-aid measures after eye contact : Rinse immediately with plenty of water for 15 minutes. Do not apply neutralizing agents. Take victim to an ophthalmologist.

First-aid measures after ingestion : Not applicable.

Most important symptoms and effects, both accute and delayes

Symptoms/injuries : Not expected to present a significant hazard under anticipated conditions of normal use.

Symptoms/injuries after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Accelerated heart action. Disturbances of heart rate. Coordination disorders. Feeling of weakness. Respiratory difficulties. Vomiting. Nausea. Disturbances of consciousness. Risk of lung edema. Respiratory collapse.

Symptoms/injuries after skin contact : Red skin. Blisters. Frostbites.

Symptoms/injuries after eye contact : Not applicable.

Symptoms/injuries after ingestion : Not applicable.

Chronic symptoms : No effects known.

Indication of any immediate medical attention and special treatment needs
No additional information available

Section 5: Fire-Fighting Measures

Extinguishing media

suitable extinguishing media	: EXTINGUISHING MEDIA FOR SURROUNDING FIRES: Adapt extinguishing media to the environment.
Unsuitable extinguishing media	: No unsuitable extinguishing media known.

Special hazards arising from the substance or mixture

Fire hazard	: DIRECT FIRE HAZARD. Non combustible.
Explosion hazard	: INDIRECT EXPLOSION HAZARD. Heat may cause pressure rise in tanks/drums: explosion risk.
Reactivity	: On burning: release of toxic and corrosive gases/vapors (hydrofluoric acid, carbon monoxide - carbon dioxide, carbonylfluoride). Reacts with (some) acids.

Advice for firefighters

Precautionary measures fire	: Exposure to fire/heat: consider evacuation.
Firefighting instructions	: Cool tanks/drums with water spray/remove them into safety. Physical explosion risk: cool from behind cover. Do not move the load if exposed to heat. After cooling: persistent risk of physical explosion. Dilute toxic gases with water spray.
Protection during firefighting	: Heat/fire exposure: compressed air/oxygen apparatus.
Other information	: NFPA Aerosol Level 1.

Section 6: Accidental Release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Protective equipment	: Insulating gloves. Protective clothing. Large spills/in enclosed spaces: compressed air apparatus.
Emergency procedures	: Keep upwind. Mark the danger area. Seal off low-lying areas. Close doors and windows of adjacent premises. No naked flames. Carry out specific temperature controls. Wash contaminated clothes. Large spills/in confined spaces: consider evacuation.

For emergency responders

Protective equipment	: Equip cleanup crew with proper protection.
Emergency procedures	: Ventilate area.

Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

Methods and material for containment and cleaning up

For containment	: Contain released substance, pump into suitable containers. Plug the leak, cut off the supply. Tip the container on one side to stop the leakage. Do not spray water on unheated tank walls.

Methods for cleaning up : Damaged/cooled tanks must be emptied.

Reference to other sections
See Heading 8. Exposure controls and personal protection.

Section 7: Handling and Storage

Precautions for safe handling
Additional hazards when processed : Pressurized container: Do not pierce or burn, even after use.

Precautions for safe handling : Comply with the legal requirements. Handle and open the container with care. Thoroughly clean/dry the installation before use. Keep away from naked flames/heat. Observe normal hygiene standards. Carry operations in the open/under local exhaust/ventilation or with respiratory protection. Measure the oxygen concentration in the air.

Conditions for safe storage, including any incompatibilities

Storage conditions	: Keep only in the original container in a cool, well ventilated place away From naked flames/heat. Keep container closed when not in use.
Incompatible products	: Strong bases. Strong acids.
Incompatible materials	: Sources of ignition. Direct sunlight.
Storage temperature	: < 50 °C
Heat-ignition	: KEEP SUBSTANCE AWAY FROM: heat sources.
Prohibitions on mixed storage	: KEEP SUBSTANCE AWAY FROM: (strong) acids.
Storage area	: Store in a cool area. Keep out of direct sunlight. Ventilation at floor level. Aboveground. Meet the legal requirements.
Special rules on packaging	: SPECIAL REQUIREMENTS: with pressure relief valve. clean. correctly labeled. meet the legal requirements.
Packaging materials	: SUITABLE MATERIAL: No data available. MATERIAL TO AVOID: No data available.

Specific end use(s)
Follow Label Directions.

Section 8: Exposure Controls/ Personal Protection

Control parameters

Exposure controls
Personal protective equipment : Gloves. Safety glasses. Avoid all unnecessary exposure.

Materials for protective clothing : GIVE GOOD RESISTANCE: neoprene. nitrile rubber. butyl rubber.
Hand protection : Insulated gloves.

Eye protection	: Safety glasses.
Skin and body protection	: Protective clothing.
Respiratory protection	: High vapor/gas concentration: self-contained respirator.
Other information	: Do not eat, drink or smoke during use.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state : Gas

Appearance : Gas.
Molecular mass : 102.03 g/mol
Color : Colorless.

Odor : Ether-like odor.

Odor threshold : No data available

pH : No data available

Relative evaporation rate (butyl acetate=1) : No data available

Melting point : -101 °C

Freezing point : No data available

Boiling point : -26 °C

Flash point	: Not applicable
Critical temperature	: 101 °C
Self ignition temperature	: > 743 °C
Decomposition temperature	: 368 °C
Flammability (solid, gas)	: No data available
Vapor pressure	: 5720 hPa
Critical pressure	: 40560 hPa
Relative vapor density at 20 °C	: 3.52 (20 °C)
Relative density	: 1.2 (-27 °C)
Density	: 1206 kg/m³ (-27 °C)
Solubility	: Poorly soluble in water. Soluble in ethanol. Soluble in ether. Soluble in hexane. Water: 0.15 g/100ml (25 °C)
Log Pow	: 1.06 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Log Kow	: No data available

Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosive limits	: No data available

Other information

VOC content	: 0 %
Gas group	: Compressed gas
Other properties	: Gas/vapor heavier than air at 20°C. Substance has neutral reaction. May generate electrostatic charges.

Section 10: Stability and Reactivity:

Reactivity

On burning: release of toxic and corrosive gases/vapours (hydrofluoric acid, carbon monoxide - carbon dioxide, carbonylfluoride). Reacts with (some) acids.

Chemical stability
Stable under normal conditions.

Possibility of hazardous reactions
Not established.

Conditions to avoid
Direct sunlight. Extremely high or low temperatures.

Incompatible materials
Strong acids. Strong bases.

Hazardous decomposition products
fume. Carbon monoxide. Carbon dioxide.

Section 11: Toxicological Information

Information on toxicological effects

Acute toxicity : Not Classified

134a (811-97-2)	
LC50 Inhalation rat (mg/l)	>2000mg/l/4h (Rat)
LC50 inhalation rat (ppm)	>359300 ppm/4h (Rat)

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified based on available data, the classification criteria are not met

Carcinogenicity : Not classified

Reproductive toxicity : Not classified based on available data, the classification criteria are not met Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified based on available data, the classification criteria are not met

Aspiration hazard : Not classified based on available data, the classification criteria are not met

Potential Adverse human health effects and symptoms : Based on available data, the classification criteria are not met.

Symptoms/injuries after inhalation : EXPOSURE TO HIGH CONCENTRATIONS: Accelerated heart action. Disturbances of heart rate. Coordination disorders. Feeling of weakness. Respiratory difficulties. Vomiting. Nausea. Disturbances of consciousness. Risk of lung oedema. Respiratory collapse.

Symptoms/injuries after skin contact : Red skin. Blisters. Frostbites.

Symptoms/injuries after eye contact : Not applicable.

Symptoms/injuries after ingestion : Not applicable.

Chronic symptoms : No effects known.

Section 12: Ecological Information

Toxicity

Ecology - general : No environmental hazard.

Ecology - air : TA-Luft Klasse 5.2.5.

Ecology - water : Mild water pollutant (surface water). Maximum concentration in drinking water: 1.5 mg/l (fluoride) (Directive 98/83/EC). Slightly harmful to fishes (LC50(96h) 100-1000 mg/l). Slightly harmful to invertebrates (Daphnia) (EC50 (48h): 100 - 1000 mg/l).

134a (811-97-2)	
LC50 fish 1	450 mg/l 96 h; Salmo gairdneri (Oncorhynchus mykiss)
EC50 Daphnia 1	980 mg/l (48 h; Daphnia magna)

Persistence and degradability

134a (811-97-2)

Persistence and degradability	Not readily biodegradable in water.

Bioaccumulative potential

134a (811-97-2)	
BCF other aquatic organisms 1	5 - 58 (Estimated value)

Log Pow	1.06 (OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

Mobility in soil

No additional information available

Other adverse effects

Other information : Avoid release to the environment.

Section 13: Disposal Considerations

Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed responsibly. All entities that store, transport or handle hazardous waste shall take the necessary measures to prevent risks of pollution or damage to people or animals. Refer to manufacturer/supplier for information on recovery/ recycling.

Additional information : LWCA (the Netherlands): KGA category 06. Hazardous waste according to Directive 2008/98/EC.

Ecology - waste materials : Avoid release to the environment.

Section 14: Transportation Information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

US DOT (ground): UN3159, 1,1,1,2-Tetrafluoroethane, 2.2, Limited Quantity

ICAO/IATA (air): UN3159, 1,1,1,2-Tetrafluoroethane, 2.2, Limited Quantity

IMO/IMDG (water): UN3159, 1,1,1,2-Tetrafluoroethane, 2, Limited Quantity

Special Provisions: DOT-SP 10232: In accordance with this special permit, the product container is marked with DOT-SP10232 instead of 2Q. This packaging is approved for shipping as a Consumer Commodity.

DOT-SP 15146: In accordance with this special permit, the product container is marked with DOT-SP15146 instead of 2Q. This packaging is approved for shipping as a Consumer Commodity.

UN proper shipping name

DOT Proper Shipping Name : 1,1,1,2-Tetrafluoroethane

Department of Transportation (DOT) Hazard Classes : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas

DOT Special Provisions (49 CFR 172.102) : DOT-SP 10232: In accordance with this special permit, the product container is marked with DOT-SP10232 instead of 2Q. This packaging is approved for shipping as a Consumer Commodity.

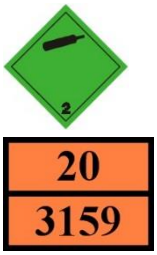
: DOT-SP 15146: In accordance with this special permit, the product container is marked with DOT-SP15146 instead of 2Q. This packaging is approved for shipping as a Consumer Commodity.

Transportation Canada : TC-SU 11282
DOT Packaging Exceptions (49 CFR 173.xxx) : 306
DOT Packaging Non Bulk (49 CFR 173.xxx) : 304
DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

Additional information
Other information : No supplementary information available.

State during transport (ADR-RID) : as liquefied gas, under pressure.

Overland transport
Class (ADR) : 2 - Gases
Hazard identification number (Kemler No.) : 20
Classification code (ADR) : 2A
Danger labels (ADR) : 2.2 - Non-flammable compressed gas
Orange plates



Tunnel restriction code : C/E

Transport by sea
DOT Vessel Stowage Location : A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.
EmS-No. (1) : F-C
EmS-No. (2) **Air transport** : S-V

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 75 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

Section 15: Regulatory Information

US Federal regulations

134a (811-97-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard

International regulations

CANADA

134a (811-97-2)	
WHMIS Classification	Class A - Compressed Gas

EU-Regulations
No additional information available

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

Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC or 1999/45/EC Not classified
15.2.2. National regulations
No additional information available

US State regulations
No additional information available

Section 16: Other Information

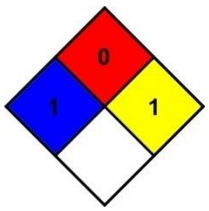
Full text of H-phrases: see section 16:

Compressed gas	Gases under pressure Compressed gas
H280	Contains gas under pressure; may explode if heated

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 0 - Materials that will not burn.

NFPA reactivity : 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible

Flammability	: 0 Minimal Hazard
Physical	: 1 Slight Hazard
Personal Protection	: B

Date of Issue: 06/01/2000
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End of Safety Data Sheet