SAFETY DATA SHEET

R-407C

ALLTEMP a DIVERSITECH company

Section 1. Identification

Product identifier : R-407C

Other means of identification : Not available.

Product type : Liquefied gas.

Identified uses : Refrigerant.

Supplier/Manufacturer : Alltemp Products Co. Ltd
827 Brock Rd S
Pickering, Ontario Canada, L1W3J2
Tel: 905-831-3311
Fax: 905-831-1864
Email: sales@alltemp.ca
Web site: www.alltemp.ca

Emergency telephone number (with hours of operation) : CANUTEC: +1-613-996-6666 or *666 (cellular)
24/7

Section 2. Hazard identification

Classification of the substance or mixture : GASES UNDER PRESSURE - Liquefied gas
SIMPLE ASPHYXIANTS - Category 1

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements : H280 - Contains gas under pressure; may explode if heated.
No Code(s) - May displace oxygen and cause rapid suffocation.

Precautionary statements

General : Vapors are heavier than air and may cause Asphyxiantxia by reduction of the oxygen content.

Prevention : Not applicable.

Response : Not applicable.

Storage : P410 - Protect from sunlight.
P403 - Store in a well-ventilated place.

Disposal : Not applicable.

Supplemental label elements : Keep container tightly closed. Use only with adequate ventilation. Do not enter storage areas and confined spaces unless adequately ventilated.

Section 2. Hazard identification

Other hazards which do not result in classification : Exposure may aggravate those with pre-existing eye, skin, or respiratory conditions. Liquid contact with eyes or skin may cause frostbite.

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Other means of identification : Not available.

Product code : Not available.

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 20 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Liquid can cause burns similar to frostbite.

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
frostbite

Section 4. First-aid measures

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following:
frostbite

Ingestion : Adverse symptoms may include the following:
frostbite

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : **Fire Hazard:** R-407C is not flammable at ambient temperatures and atmospheric pressure. R-407C can become combustible with high concentrations of air at elevated pressure and/or temperature and 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). For example, do not mix R-407C with air under pressure for leak detection purposes.
Explosion Hazard: Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries
Reactivity: Hazardous reactions will not occur under normal conditions.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated hydrocarbons
hydrogen fluoride (HF)

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

Advice on general occupational hygiene : 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

None.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Section 8. Exposure controls/personal protection

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : The gas can cause asphyxiation without warning by replacing the oxygen in the air. Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. If operating conditions cause high gas concentrations to be produced or any recommended or statutory exposure limit is exceeded, use an air-fed respirator or self-contained breathing apparatus. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Thermal hazards : If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Liquefied gas.]

Color : Colorless.

Odor : Ethereal. [Slight]

Odor threshold : Not available.

pH : Neutral.

Melting point : Not available.

Boiling point : -43.9°C (-47°F)

Flash point : Not available.

Evaporation rate : >1 ($CC1_4$ = 1)

Flammability (solid, gas) : Not available.

Section 9. Physical and chemical properties

Lower and upper explosive (flammable) limits : Not available.

Vapor pressure : 156.2 psia @ 21.1 °C (70 °F)
356.7 psia @ 54.4 °C (129.9 °F)

Vapor density : 2.43 [Air = 1]

Relative density : 72.045 lbm/ft^3 @ 21.1 °C (70 °F)

Solubility in water : 1.5 g/l

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : >250°C (>482°F)

Viscosity : Not available.

Flow time (ISO 2431) : Not available.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Direct sunlight. Extremely high or low temperatures. Ignition sources. Incompatible materials. Do not mix with oxygen or air above atmospheric pressure. Can form a combustible mixture with air at pressures above atmospheric pressure.

Incompatible materials : Strong acids. Strong bases. Strong oxidizers. Potassium, calcium, powdered metals, finely divided aluminum, magnesium, zinc.

Hazardous decomposition products : Carbon oxides (CO, CO_2). Halogenated hydrocarbon. Hydrogen fluoride (HF).

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

There is no data available.

Irritation/Corrosion

There is no data available.

Sensitization

There is no data available.

Mutagenicity

There is no data available.

Carcinogenicity

Classification

Section 11. Toxicological information

Product/ingredient name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Norflurane	-	-	-	A4	-	-
Pentafluoroethane	-	-	-	A4	-	-
Difluoromethane	-	-	-	A4	-	-

Reproductive toxicity

There is no data available.

Teratogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eye contact : Liquid can cause burns similar to frostbite.

Inhalation : At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

Skin contact : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Ingestion : Ingestion of liquid can cause burns similar to frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following: frostbite

Inhalation : No known significant effects or critical hazards.

Skin contact : Adverse symptoms may include the following: frostbite

Ingestion : Adverse symptoms may include the following: frostbite

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.

Section 11. Toxicological information

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

There is no data available.

Persistence and degradability

There is no data available.

Bioaccumulative potential

There is no data available.

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	TDG Classification	IMDG	IATA
UN number	UN3340	UN3340	UN3340
UN proper shipping name	REFRIGERANT GAS R 407C	REFRIGERANT GAS R 407C	REFRIGERANT GAS R 407C
Transport hazard class(es)	2.2 	2.2 	2.2 
Packing group	-	-	-
Environmental hazards	No.	No.	No.
Additional information	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2. 17 (Class 2).	**Emergency schedules** F-C, S-V	-

AERG : 126

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

Canadian lists

Canadian NPRI : The following components are listed: Norflurane; Pentafluoroethane; Difluoromethane

CEPA Toxic substances : The following components are listed: Norflurane; Pentafluoroethane; Difluoromethane

Canada inventory : All components are listed or exempted.

Section 16. Other information

Procedure used to derive the classification

Classification	Justification
GASES UNDER PRESSURE - Liquefied gas SIMPLE ASPHYXIANTS - Category 1	Expert judgment Calculation method

History

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Prepared by : KMK Regulatory Services Inc.

Section 16. Other information

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations
HPR = Hazardous Products Regulations

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