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Safety Data Sheet


“SDS”

1. PRODUCT IDENTIFICATION

Product Name:	Flammable HC POLYCOLD® Refrigerant: PT-13, PT-14, PT-16 and PT-30
Chemical Classification:	Liquefied Gas/Flammable Gas
REACH Registered Components	Ethane, Methane & Propane
Product Use:	Refrigerant Gas for PCC, CRYOTIGER® and AquaTrap® Cooling Systems
Manufacturer's Name:	Brooks Automation, Inc.
Address:	15 Elizabeth Drive, Chelmsford, MA 01824
Business Phone:	978-262-2400
Responsible Person:	Brooks Automation, Inc. 15 Elizabeth Drive Chelmsford, MA 01824
SDS Preparer email:	rsp9968@comcast.net
Emergency Phone: CHEMTREC North America:	1-800-424-9300 1-703-527-3887

2. HAZARD IDENTIFICATION

Hazard Classification
Classification of Mixture Under Regulation (EC) 1272/2008/EC (CLP/GHS) Gases under pressure, Liquefied gas H220 Extremely Flammable gas H280 Contains gas under pressure; may explode if heated
Classification of the Mixture Under Directive 67/548/EEC & 1999/45/EC Extremely Flammable
Label Elements
Name on Label: Flammable HC POLYCOLD® Refrigerant: PT-13, PT-14, PT-16 and PT-30

<p>Label Pictograms:</p> 	
<p>Signal Word: Danger</p>	
<p>Hazard Statements: H220 Extremely Flammable Gas H280 Contains gas under pressure; may explode if heated</p>	
<p>Precautionary Statements: P210 Keep away from heat/sparks/open flames/.../hot surfaces. ... No smoking. P243 Take precautionary measures against static discharge. P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely P381 Eliminate all ignition sources if safe to do so. P281 Use personal protective equipment as necessary P410+P403 Protect from sunlight. Store in a well ventilated area.</p>	
<p>Other Product Labels or Markings</p>	
<p>Refrigeration Units:</p>	<p>CAUTION: THIS UNIT HAS INTERNAL SYSTEMS WITH LIQUID AND GAS UNDER PRESSURE. Store and use in a well-ventilated area where temperatures will not exceed 52° C (125° F). Contact the manufacturer or a certified technician for the repair and maintenance of internal refrigeration systems.</p>
<p>Cylinders:</p>	<p>CAUTION: LIQUID AND GAS UNDER PRESSURE. CAN CAUSE RAPID SUFFOCATION. MAY CAUSE FROSTBITE. Store and use with adequate ventilation. Do not get liquid in eyes, on skin or clothing. Cylinder temperature should not exceed 52° C (125° F). Use in accordance with the Material Safety Data Sheet.</p> <p>FIRST AID: If inhaled, administer fresh air immediately. Administer oxygen if breathing is difficult. Contact a physician. In case of frostbite, obtain immediate medical attention. DO NOT REMOVE THIS PRODUCT LABEL.</p>

3. COMPOSITION AND INFORMATION ON INGREDIENTS

Substance Name	Concentration (%)	CAS No.	EINECS No.
Ethane	5 – 25	74-84-0	200-814-8



Methane	1 – 15	74-82-8	200-812-7
Propane	25 - 75	74-98-6	200-827-9
Inert Gases	0 – 55	N/A	N/A

Hazardous components according to Regulation (EC) 1272/2008, as amended

Substance Name	Hazard Class	Hazard Category	H Phrases	R Phrases**
Ethane	Flammable Gas	Category 1	H220	R12
Propane	Flammable Gas	Category 1	H220	R12
Methane	Flammable Gas	Category 1	H220	R12
Inert Gases	Gases under pressure	Liquefied gas	H280	R36/R37

**R Phrases under European Directive 67/548/EEC or 1999/45/EC, as amended.

4. FIRST-AID MEASURES

First Aid Measures by Routes of Exposure	
General Notes on Health Effects or Risk of Exposure:	Exposure to high concentrations may result from a release or spill in a poorly ventilated area. Inhalation of high-concentrations may result in suffocation from oxygen deprivation or other severe health effects including central nervous system depression, heart attack, and sudden death. Direct skin or eye contact with rapidly released gas may cause frostbite and severe tissue damage.
Inhalation:	Administer fresh air immediately. Use a bag valve mask or similar device to perform artificial respiration (rescue breathing) if needed. Get medical attention immediately.
Skin Contact:	Wash if needed. If frostbite, freezing, or cryogenic burns occur, warm affected area in warm water. If this is not available, gently wrap affected parts in blankets. Allow circulation to return naturally. Get medical attention immediately.
Eye Contact:	Wash with large amounts of water or normal saline until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately. Remove contact lenses if easily possible.
Ingestion:	Get medical attention immediately.
Most Significant Symptoms of Exposure by Route	

Inhalation:	The most significant route for overexposure is through inhalation of high concentrations of the gas product. A large gas release into a confined area may displace available oxygen and result in asphyxiation. A severe overexposure may cause temporary nervous system depression resulting in symptoms such as dizziness, shortness of breath, weakness, headache, confusion, and loss of coordination or consciousness.
Skin Contact:	Contact with rapidly released gas may cause frostbite. Other direct dermal contact may result in skin de-fatting, dryness, irritation, or contact dermatitis. Symptoms of frostbite may include changes in skin color to white or grayish-yellow.
Eye Contact:	Eye contact with rapidly released gas may cause severe frostbite damage to eyes and lids. Eye irritation may occur with exposure to low concentrations.
Ingestion:	Not a likely route of exposure. Perforation of the stomach lining and nausea may develop if liquid product is ingested.
Other Potential Health Effects:	Inhalation associated with deliberate abuse, or spills occurring in poorly ventilated areas, may result in severe cardiovascular and respiratory effects, and even sudden death.
Carcinogenicity:	OSHA - No NTP - No IARC - No
Environmental Hazards	Not expected to cause aquatic damage or ozone depletion.

5. FIRE FIGHTING MEASURES

Fire Extinguishing Media:	Use media appropriate for surrounding materials.
Unusual Fire and Explosion Hazards:	CAUTION: Cylinders that are exposed to heat from a fire may rupture or burst and release contents. Escaping gas is extremely flammable.
Special Fire Fighting Procedures:	Use self-contained breathing apparatus. Move cooling systems and/or components away from fire if possible without personal risk. Keep units cool using a water spray from a maximum distance. Continue cooling well after fire is out. Stay upwind and keep out of low areas. Ventilate closed spaces prior to entry.

6. ACCIDENTAL RELEASE MEASURES

Spill and Leak Response for Non-emergency Personnel:	Stop leak immediately if possible without personal risk. Keep people away, isolate area and deny access.
Spill and Leak Response for Emergency Personnel:	Evacuate Area. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Ensure adequate air ventilation. Eliminate ignition sources. Stop leak immediately if possible without personal risk. Prevent from entering sewers, basements and work pits or any low lying place where accumulation is probable. Ventilate area to clean up. CAUTION: Gasses may be heavier than air and may travel along the ground; reaching sources of ignition and/or collecting in low or confined areas (sewers, basements, tanks). Stay upwind and avoid low areas and sources of ignition. Ventilate and test oxygen levels in closed spaces prior to entry. Water spray may be used to reduce vapor cloud drift.
Methods and Materials for Containment and Cleaning Up:	Allow product to evaporate.
Environmental Precautions:	Avoid discharge of product to the environment. Do not allow product to enter drains or watercourses.
Reference to Other Sections:	For recommendations on PPE and other exposure controls, refer to protective measures referred to in Section 8.

7. HANDLING AND STORAGE

Special Precautions for Handling Gas Cylinders:	Protect cooling systems against physical damage. Do not allow temperature of storage areas to exceed 52° C (125° F). Keep in a well ventilated space. Segregate from oxidant gases and other oxidants during storage.
Conditions for Safe Storage and Handling:	Cooling systems and components contain extremely flammable gas products under pressure. System components that are exposed to heat from a fire may explode. Refer to Cooling System Operating Manual for safe operation, storage and handling procedures.

8. EXPOSURE CONTROLS – PERSONAL PROTECTION

Occupational Exposure Limits:	Ethane: ACGIH (United States) 1000 ppm 8-hour TWA Methane: ACGIH (United States) 1000 ppm 8-hour TWA Propane: ACGIH (United States) 1000 ppm 8-hour TWA OSHA PEL (United States) 1000 ppm 8-hour TWA
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Monitoring Procedures:	Upon release into a confined area, monitor for presence of available oxygen.
Ventilation and Engineering Controls:	Provide local exhaust ventilation.
Respiratory Protection:	If large enough volumes of gas are released into worker-occupied areas so that available air/oxygen is displaced, then a self-contained breathing apparatus (SCBA) should be used.
Eye Protection:	Splash goggles, face shields, or safety glasses should be used for protection from rapidly expanding gas.
Hand Protection:	Wear Viton or rubber gloves if contact with gas or liquid may occur.
Body Protection:	A protective suit should be worn to prevent frostbite and skin contamination if contact with liquid or gas may occur.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Colorless gas or liquid
Appearance and Color:	Odorless.
Odor Threshold:	Not available.
pH:	Not applicable.
Freezing Point :	Less than -200° C
Boiling Point:	Less than -100° C
Flashpoint:	-187° C
Evaporation Rate:	Not available.
Flammability	Highly flammable
Flammable Limits (in air by volume, %)	9 – 27%
Vapor Density (range of individual components at standard temperature and pressure):	Greater than 1 (Heavier than air)
Not available.	Not available.
Solubility:	Not available.
Partition Coefficient: n-octanol/water	Not available.
Auto-ignition Temperature:	Not applicable.
Decomposition Temperature:	Not applicable.
Viscosity:	Not applicable.



Explosive Properties:	Not applicable.
Oxidizing Properties:	Not applicable.
Vapor Pressure:	Not available.
How to Detect This Substance (Warning Properties):	The gas is not visible, however, rapidly released gases may cause the formation of a vapor cloud. The gas may be odorless or have a faintly sweet odor or ether-like odor.

10. STABILITY AND REACTIVITY

Reactivity:	Not reactive at normal temperatures and pressures.
Chemical Stability:	Stable at normal temperatures and pressures.
Possibility of Hazardous Reactions:	Not likely except during accidental release of gas product.
Conditions to Avoid:	Excessive heat.
Incompatible Materials:	Oxidizers may produce fire and explosion hazards.
Hazardous Decomposition Products:	None
Hazardous Polymerization:	Will not polymerize.

11. TOXICOLOGICAL INFORMATION

Toxicity Data:	Low order of toxicity.
Suspected Cancer Agent:	Not a suspected cancer agent.
Irritancy of Product:	Not considered an irritant.
Sensitization to the Product:	Not considered a sensitizer.
Reproductive Toxicity Information:	No reproductive toxic effects on humans have been described for the components of this product.
Medical Conditions Aggravated by Exposure:	None known.
Recommendations to Physicians:	Treat for simple asphyxia.
Biological Exposure Indices (BEIs):	None known.

12. ECOLOGICAL INFORMATION

Toxicity:	Specific toxic effects are not known.
Environmental Persistence and Degradability:	Gas components are expected to volatilize rapidly from soil and water surfaces. Vapor phase gases are expected to degrade very slowly in the ambient atmosphere.
Bioaccumulative Potential:	Bioconcentration in organisms or aquatic life is expected to be low.
Mobility in Soil:	Unknown
Results of PBT and vPvB Assessment:	Not applicable
Other Adverse Effects:	None known

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods:	Dispose in accordance with all applicable regulations. Avoid discharge to atmosphere, particularly in confined areas where there is a risk of forming an explosive mixture with air. Waste gas should be glared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Contact manufacturer if guidance is required. "Empty" cylinders can contain flammable vapor. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.
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14. TRANSPORT INFORMATION

Proper Shipping Names:	
Proper Shipping Names:	Exceptions from hazardous material transportation requirements for shipments of the PCC, CRYOTIGER® and AquaTrap® cooling systems and components are allowed depending upon (1) the amount of refrigerant gas in the package and (2) the mode of transportation by which the package is being offered for shipment. Based on the aggregate quantity of gas in a package, exceptions are allowed for air shipments under IATA and ICAO Dangerous Goods Regulations (DGRs) and surface shipments (rail, road and maritime) under US DOT Hazardous Material Regulations (HMRs). The quantity restrictions and basis for these exceptions are detailed on the following page.
For Complete Cooler System Shipments	Surface Shipments: <i>Refrigerating machines, 2.1, UN 3358, containing flammable, non-toxic liquefied gas</i>

having greater than 100-grams of gas mixture:	ERG Code: 10L Air shipments of systems with >100 g of gas mixture are FORBIDDEN from air transport. System must be disassembled so that single unit packages contain less than 100 grams of gas mixture.
U.N. Hazard Class Number:	2.1 (Flammable Gas).
Air Shipments of Components Having Less Than 100 grams of Gas Mixture: Applicability of IATA Special Provision 103	Refrigerating machine component(s) containing less than 100 grams of flammable, non-toxic liquefied gases are not subject to Dangerous Goods Regulations in accordance with IATA Special Provision A103. This would include any single unit packages of Compressors, Cold Ends, 10'-100'ft. Flex Hoses or Copper Lines and External Filter Dryers for PCC, CRYOTIGER® and AquaTrap® Cooling Systems.
Surface Shipments of Components Having Less Than 12-kg of Gas Mixture:	Refrigerating machine component(s) containing less than 12 kg of flammable, non-toxic liquefied gases are not subject to US HMR under 49 CFR 173.307 (a)(4)(iii). This would include a PCC, CRYOTIGER® or an AquaTrap® Cooling Systems containing a PCC Compressor, a CryoTiger® or Aquatrap® Cold End, a pair of 10'-100'ft. Flex Hoses or Copper Lines and an External Filter Dryers in a single package.
For 500-cc (.5 L), 20-lb (9 L), 50-lb (21.6 L), and 100-lb (45.4 L) Charge Cylinders	<i>Compressed gas, flammable, n.o.s. (Propane, Ethane), 2.1, UN 1954</i> Packing Instruction: 200 ERG Code: 10L <i>Forbidden on passenger aircraft without satisfying special provisions.</i>
U.N. Identification Number:	UN 3358 for charged systems and components UN 1954 for 500 cc (0.5 L), 20 lbs. (9 L), 50 lbs. (21.7 L), and 100 lbs. (45.4 L) charge cylinders.
North American Emergency Response Guidebook Number (1996):	115
Marine Pollutant:	Not applicable.
Canada Transportation of Dangerous Goods Regulations:	This material is considered a dangerous good. Use the above information to prepare Canadian shipments.
U.S DOT 49 CFR, Parts 100-105:	This material is regulated as a hazard material (HM) under DOT regulations.
IATA/ICAO/IMDG Regulations:	This material is considered a dangerous good (DG) and is to be shipped in accordance with these regulations for international shipments.
IATA/ICAO/IMDG Emergency Response Guidelines:	Follow 2014/2014 Edition of the IATA/ICAO Emergency Response Guidance for aircraft incidents Involving dangerous goods.

15. REGULATORY INFORMATION

U.S. SARA Reporting Requirements:	NOT APPLICABLE
U.S. SARA Threshold Planning Quantity:	NOT APPLICABLE
U.S. CERCLA Reportable Quantity (RQ):	NOT APPLICABLE
Canadian DSL/NDSL Inventory Status:	Some product ingredients are listed.
U.S. TSCA Inventory Status:	NOT APPLICABLE
U.S. State Regulatory Information:	This product is subject to state worker and community Right-to-Know Acts.
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65):	Some product ingredients are listed.
EINECS Number:	Refer to Section 3.
Canadian WHMIS Classification:	Class B1: Flammable Gases
U.K. Legislation:	Control of Substances Hazardous to Health as amended.

16. OTHER INFORMATION

H phrases:	H220 Extremely Flammable gas H280 Contains gas under pressure; may explode if heated
R phrases:	R12, 36/37 Flammable. Irritating to eyes and respiratory system. (R 10: Liquid substances with a flash point equal to or greater than 21° C and less than or equal 55° C.)
S Phrases:	2, 9, 15, 16, 33, 35 S2: Keep out of reach of children. S9: Keep cooler system in a well-ventilated place. S15: Keep away from heat. S16: Keep away from sources of ignition (NO SMOKING). S33: Take precautionary measures against static discharges. S35: This material and its container must be disposed of in a safe way.
Uses and Restrictions:	Only use product in accordance with its intended use. Cylinders should never be refilled without permission from the owner.



All Gas-containing Cylinders, Units and Components:	“EXTREMELY FLAMMABLE gases under pressure” CAUTION: THIS UNIT CONTAINS EXTREMELY FLAMMABLE GASES UNDER PRESSURE. Keep away from sources of ignition. NO SMOKING. Store and use in a well-ventilated area where temperatures will not exceed 52°C (125° F). Take precautionary measures against static discharges. Keep out of reach of children. Refer to the Operation Manual, or contact the manufacturer or a certified technician, to insure safe and proper assembly, operation and maintenance of the cooling system. FIRST AID: If inhaled, administer fresh air immediately. Administer oxygen if breathing is difficult. Contact a physician. In case of frostbite, obtain immediate medical attention. DO NOT REMOVE THIS PRODUCT LABEL.		
	REVISION HISTORY		
Revision	ECO No.	Date	Author
13	56700	August, 2012	RMEC
B	62118	30-Sep-12	DLM
C	64871	08-Jan-13	DLM
D	82515	04-Apr-15	RPalermo / ECBrett
E	88493	06-Apr-16	VK

****End of SDS****