

Section 1: Product and Company Identification
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Northcutt, Inc
 5055 N. Broadway
 Wichita, KS 67219
 USA
 Business: 316-838-1477
 FAX: 316-838-6203
www.northcutt.org
www.hcrefrigerant.com

Product Name: HC-12a[®] Refrigerant
 HC-22a[®] Refrigerant
 HC-502a[®] Refrigerant
Generic Name: Hydrocarbon refrigerant
Synonyms: NA
Product Description: Non-halogenated refrigerant
CAS # NA – mixture
Date of Revision: 21 June 2010

24-Hour Emergency Phone Number: (800) 424-9300 (CHEMTREC) U.S. & Canada
Outside U.S. & Canada Call (703) 527-3887
Use only for spills and releases.

Section 2: Hazard Identification

Emergency Overview: Flammable gas mixture is colorless and stench to facilitate detection. Inhalation may adversely affect the central nervous system. Release of gas into enclosed or poorly ventilated spaces may cause local concentrations above exposure limits. Release of gas into enclosed or poorly ventilated spaces may cause an oxygen-deficient atmosphere and lead to asphyxiation. Use with adequate ventilation.

HMIS HEALTH	1
HMIS FLAMMABILITY	4
HMIS REACTIVITY	0
PERSONAL PROTECTION	B

EU Classification: Extremely flammable

OSHA Regulatory Status: This material is considered hazardous under the OSHA standard.

WHMIS Classification: A, B1

Potential Health Effects:

Inhalation: May produce anesthetic effects and feeling of euphoria. Prolonged overexposure can cause rapid breathing, headache, dizziness, narcosis, unconsciousness and death. Increasing local concentrations of refrigerant gas will cause decreasing concentrations of oxygen and may lead to asphyxiation.

Ingestion: Not considered an exposure route.

Skin or Eye Contact: Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite or freezing damage to tissue and permanent eye damage. Exposure to gas at ambient pressure and temperature is not considered hazardous to skin or eyes.

Chronic Exposure: May damage liver, kidneys and peripheral nervous system.

Aggravation of Pre-existing Conditions: No information found.

Target Organs: Central nervous system, respiratory system

Section 3: Composition / Information On Ingredients
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HC-12a[®] Refrigerant

Component	CAS #	EINECS	EU Class	R Phrases	Mass %
trimethylmethane	75-28-5	200-857-2	F+	12	> 40
Propylhydride	74-98-6	200-827-9	F+	12	> 50
Highly refined mineral oil	8042-47-5	232-455-8			< 2

HC-22a[®] Refrigerant

Component	CAS #	EINECS	EU Class	R Phrase	Mass %
Propylhydride	74-98-6	200-827-9	F+	12	> 98

HC-502a® Refrigerant

Component	CAS #	EINECS	EU Class	R Phrase	Mass %
Propylhydride	74-98-6	200-827-9	F+	12	> 90
Dimethyl	74-84-0	200-814-8	F+	12	3 – 7

Non-hazardous components may or may not be listed. Carcinogens are listed when present at 0.1% or more; components which are otherwise hazardous according to OSHA are listed when present at 1.0% or more. This is not intended to be complete compositional disclosure. See Section 15 for applicable states right to know and other regulatory information.

Section 4: First Aid Measures

Inhalation: Remove victim to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: Not likely to occur.

Skin: In case of frostbite from liquid or gas exposure, place affected area in lukewarm water and maintain until circulation returns.

Eyes: Check for contact lenses and remove, if present. Flush eyes for at least 15 minutes with lukewarm water. If irritation develops, seek medical attention immediately.

Note to Physicians: Treat symptomatically and supportively.

Section 5: Fire Fighting Measures

	HC-12a®	HC-22a®	HC-502a®
Flash Point	-104°C (-156°F)	-105°C (-157°F)	-105°C (-157°F)
Lower Flammable Limit, Vol%	1.8	2.1	2.1
Upper Flammable Limit, Vol%	9.5	9.5	12.5
Autoignition temperature	891°C (1636°F)	480°C (896°F)	472°C (882°F)

Extinguishing Media: Water spray, dry chemical, alcohol foam or carbon dioxide. Water spray may be used to keep fire-exposed containers cool.

Special Precautions: May be ignited by static discharge. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

NFPA Rating: Health - 1 Flammability - 4 Reactivity - 0 Other – NA

Section 6: Accidental Release Measures

Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Use non-sparking tools and equipment. Ventilate area of leak or spill.

Section 7: Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Observe proper bonding and grounding procedures during transfers. Isolate from any source of heat or ignition. Do not allow cylinder temperatures to exceed 54°C (130°F). Separate from incompatibles, combustibles, organic or other readily oxidizable materials. Containers of this material may be hazardous when empty since they retain product residues (liquid, vapors); observe all warnings and precautions listed for the product.

Section 8: Exposure Control / Personal Protection**Exposure Guidelines:**

Component	CAS #	OSHA PEL	ACGIH TLV	NIOSH TLV
Trimethylmethane	75-28-5	None established	1000 ppm	800 ppm 1900 mg/m ³
Propylhydride	74-98-6	1000 ppm 1800 mg/m ³	2500 ppm	1000 ppm IDLH 2100 ppm
Dimethyl	74-84-0	None established	1000 ppm	None established
Highly refined mineral oil	8012-95-1	5 mg/m ³ , mist		5 mg/m ³ ST 10 mg/m ³

International Exposure Limits**Dimethyl:**

Australia: Asphyxiant

Belgium: Asphyxiant

Hungary: Asphyxiant

Switzerland: MAK-W = 10000 ppm (12500 mg/m³)

United Kingdom: Asphyxiant

In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam, New Zealand, Singapore,

Vietnam check ACGIH TLV

Propylhydride:

Australia: Asphyxiant

Austria: MAK = 1000 ppm (1800 mg/m³)

Belgium: Asphyxiant

Denmark: TWA = 1000 ppm (1800 mg/m³)Finland: TWA = 800 ppm (1100 mg/m³)Germany: MAK = 1000 ppm (1800 mg/m³)

Hungary: Asphyxiant

The Philippines: TWA = 1000 ppm (1800 mg/m³)Switzerland: MAK-W = 1000 ppm (1800 mg/m³)

United Kingdom: Asphyxiant

In Argentina, Bulgaria, Colombia, Jordan, Korea, New Zealand, Singapore, Vietnam, New Zealand, Singapore,

Vietnam check ACGIH TLV

Trimethylmethane:Germany: MAK = 1000 ppm (2350 mg/m³)**Personal Protective Equipment:****Skin Contact:** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Nitrile and NBR gloves are recommended.**Eye Contact:** Use chemical safety goggles and/or full face shield where misting or splashing of liquids is possible. Maintain eye wash fountain and quick-drench facilities in work area.**Inhalation:** No special respiratory protection is required under normal circumstances of use. Maintain component levels below 50% of the TLVs of components (see previous page) and oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection when component levels exceed 50% of the TLV, oxygen levels are below 19.5%, or during emergency response to a release of this gas mixture. During an emergency situation, before entering the area, check the concentration of components and oxygen. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations, the Canadian CSA Standard Z94.4-93, applicable standards of Canadian Provinces, the European Standard EN149, applicable standards of EU member states, the Australian Standard 1716-Respiratory Protective Devices, the Australian Standard 1715-Selection, Use, and Maintenance of Respiratory Protective Devices, or requirements of Japan. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied-air respirator is required under OSHA's Respiratory Protection Standard (1910.134-1998).**Engineering Controls:** A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Use explosion-proof motors and fans for this flammable product.

Section 9: Physical and Chemical Properties			
	HC-12a® Refrigerant	HC-22a® Refrigerant	HC-502a® Refrigerant
Appearance	Colorless gas	Colorless gas	Colorless gas
Odor	Stenched for leak detection	Stenched for leak detection	Stenched for leak detection
Odor Threshold	Well below exposure limits	Well below exposure limits	Well below exposure limits
Freezing Point	-209°C (-345 °F)	-188°C (-306 °F)	-188°C (-306 °F)
Boiling Point	-33°C (-28 °F)	-42°C (-44°F)	-49°C (-56 °F)
Flash Point	-104°C (-156°F)	-105°C (-157°F)	-105°C (-157°F)
Lower Flammable Limit, Vol%	1.8	2.1	2.1
Upper Flammable Limit, Vol%	9.5	9.5	12.5
Specific Gravity (g/mL)	0.535	0.512	0.504
pH	Not Applicable	Not Applicable	Not Applicable
Solubility in water	Very slight	Very slight	Very slight
Vapor Pressure (kPa@21°C)	483 (70 psig @ 70 °F)	758 (110 psig @ 70 °F)	945 (137 psig @ 70 °F)
Vapor Density	1.74	1.52	1.50

Section 10: Stability and Reactivity

Chemical Stability: This product is stable in closed containers at room temperature.

Hazardous Decomposition Products: Carbon oxides (CO, CO₂), organic acids and aldehydes

Hazardous Polymerization: Polymerization will not occur.

Incompatibilities: Oxygen, chlorine, strong oxidizers, sparks, flame, heat, static discharge

Conditions to Avoid: Incompatible materials, combustible materials.

Section 11: Toxicological Information

Acute Dose Effects: Eyes: No information found

Skin: No information found

Oral: No information found

Inhalation: Dimethyl: Rat LC50: 658 mg/L (4-hr); Propylhydride: Rat LC50: 12,190 ppm (4-hr); Trimethylmethane: Rat LC50: 13,023 ppm (4-hr)

Section 12: Ecological Information

Environmental Fate: This product is not expected to bioaccumulate. This product is not readily biodegradable.

Ecotoxicity: Acute toxicity to aquatic organisms is unlikely due to low solubility in water.

Section 13: Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

Section 14: Transport Information

IATA
Proper Shipping Name: Petroleum gases, liquefied
DOT Hazard Class: 2.1
UN Number: 1075
Packing Group: N/A

ADR
Proper Shipping Name: Petroleum gases, liquefied
DOT Hazard Class: 2.1
UN Number: 1075
Packing Group: N/A

IMDG
Proper Shipping Name: Petroleum gases, liquefied
DOT Hazard Class: 2.1
UN Number: 1075
Packing Group: N/A

Canadian TDG
Proper Shipping Name: Petroleum gases, liquefied
DOT Hazard Class: 2.1
UN Number: 1075
Packing Group: N/A

U.S. Domestic
Proper Shipping Name: Petroleum gases, liquefied
DOT Hazard Class: 2.1
UN Number: 1075
Packing Group: N/A

CERCLA Reportable Quantity (RQ): N/A

Releases exceeding the reportable quantity (RQ) must be reported to the National Response Center (800) 424-8802. This data provided for information only. The description shown may not apply to all shipping situations. Consult 49 CFR, or appropriate regulations to properly classify your shipment for transportation.

Section 15: Regulatory Information

TSCA Chemical Inventory: All of the chemicals in this product are listed on the TSCA Inventory.

TSCA Sec 4 Chemical Test Rule: None of the chemicals in this product are under a Chemical Test Rule.

TSCA Sec 8(d): None of the chemicals in this product are on the Health and Safety Reporting List.

TSCA Sec 12(b) Notices of Export: None of the chemicals in this product are on this list.

TSCA Significant New Use Rule (SNUR): None of the chemicals in this product are on this list.

SARA Sec 302 (EHS) TPQ: None of the chemicals in this product have a TPQ.

SARA Sec 302 (EHS) RQ: None of the chemicals in this product have a RQ.

SARA Sec 311/312: Acute – YES; Chronic – YES; Fire – NO; Release of Pressure – YES; Reactivity – NO

SARA 313 List: None of the components of these products is reportable under Section 313 Title III and 40 CFR Part 372.

CERCLA Hazardous Substances and corresponding RQs: N/A

RCRA: None of the chemicals in this product are on this list.

Clean Air Act: Hazardous Air Pollutants? NO **Class 1 Ozone Depletors?** NO **Class 2 Ozone Depletors?** NO

Clean Water Act: Hazardous Substance? NO **Priority Pollutant?** NO **Toxic Pollutant?** NO

Chemical Weapons Convention: None of the chemicals in this product are on this list.

Drug Enforcement Agency (DEA) CDTA: None of the chemicals in this product are on this list.

OSHA: None of the chemicals in this product are considered Highly Hazardous by OSHA.

State Right-to-Know Lists: Propylhydride and trimethylmethane are found on the Right-to-Know lists of Massachusetts, New Jersey and Pennsylvania.

California Proposition 65: None of the chemicals in this product are on this list.

Canadian: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

The components in this product are listed, or are exempt from listing, on the Canadian Domestic Substances List.

WHMIS Classification: A, Compressed gas; B1, Flammable gas

WHMIS Labeling:



Ingredient Disclosure List: None of the components in these products are on this list.

European Union: Compliant with Directives 67/548/EEC and 91/155/EEC and EC No 1272/2008.

EU Labeling:



Full text of risk phrases appearing in Section 2:

R12 Extremely flammable.

Section 16: Other Information

Abbreviations and acronyms used:

ACGIH	American Conference of Governmental Industrial Hygienists	NA	not applicable, not available
ANSI	American National Standards Institute	NIOSH	National Institute for Occupational Safety and Health
atm	atmosphere (pressure unit)	ND	not determined
BOD	biological oxygen demand	NFPA	National Fire Prevention Association
CAS	Chemical Abstracts Service	NTP	National Toxicology Program
CC	closed cup	OC	open cup
CDTA	Chemical Drug and Trafficking Act	OSHA	Occupational Safety and Health Administration
COC	Cleveland Open Cup	Part	partition
COD	chemical oxygen demand	PEL	permissible exposure limits
CFR	Code of Federal Regulations	ppb	parts per billion
CPR	cardio-pulmonary resuscitation	PPE	personal protective equipment
DEA	Drug Enforcement Agency	ppm	parts per million
DOT	Department of Transportation	psi	pounds per square inch

EINECS	Euorpean Inventory of Existing Commercial Chemical Substances	RCRA	Resource Conservation and Recovery Act
FDA	Food and Drug Administration	RQ	Reportable quantity
IARC	Internat'l Agency for Research on Cancer	RTK	Right to Know
IDLH	immediate danger to life and health	SARA	Superfund Amendments and Reauthorization Act
kg	kilogram	STEL	short-term exposure limit
L	liter	TCC	Tagliabue Closed Cup
LC50	median lethal concentration	TPQ	threshold planning quantity
LD50	median lethal dose	TQ	threshold quantity
LEL	lower explosive limit	TSCA	Toxic Substances Control Act
mg	milligram	TWA	time-weighted average
mL	milliliter	UEL	upper explosive limit

This document was prepared in accordance with EC No 1272/2008, ANSI Z400.1-2004 and 29 CFR 1910.1200.

Prepared by Douglas R. Chrisope on 21 June 2010.

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