NorLAB
A DIVISION OF NORCO, INC.

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Or Norco (208) 336-1643

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R-410A 0.0001% to 1% in Nitrogen

MATERIAL SAFETY DATA SHEET

Identification

Product Name: R-410A in Nitrogen
Chemical Name: R-410A (50% Difluoromethane, 50% Pentafluoroethane) in Nitrogen
Chemical Family: Gas Mixture
CAS Number: N/A
Common Names/Synonyms: Calibration Gas Mixture
MSDS Identification Code/Number: NLB 3050
Prepared by: Quality Dept.

Revision Date: 03/01/12
Last Review Date: 03/01/12

Composition, Information on Ingredients, Exposure Limits

Exposure Limits[1]

Ingredient	% Volume	PEL-OSHA[1]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Refrigerant R-410A Formula: CH_2F_2, CHF_2CF_3 50% Difluoromethane CAS# 75-10-5 50% Pentafluoroethane CAS# 354-33-6	0.0001% to 1.0% 1 PPM to 10,000PPM	Not Available	Not Available	Difluoromethane LC_{50}: 520,000 ppm inhalation rat (4 Hr)
Nitrogen Formula: N_2 CAS: 7727-37-9 RTECS#: QW9700000	Balance	None Established	Simple Asphyxiant	Not Applicable

[1] Refer to individual state or provincial regulations, as applicable, for limits that may be more stringent than those listed here.
[2] As stated in 29 CFR 1910, Subpart Z (revised July1, 1993)
[3] As stated in the ACGIH 2007 Threshold Limit Values for Chemical Substances and Physical Agents

OSHA Regulatory Status: This material is classified as hazardous under OSHA regulations.

Hazards Identification

Emergency Overview:
Simple Asphyxiant-This product does not contain oxygen and may cause asphyxia if released in a confined area. Colorless, non-flammable gas with a possible faint sweetish odor. High concentrations may cause nausea, dizziness and headaches. Repeated or prolonged skin contact may cause irritation or dermatitis. Use only with adequate ventilation. Contents under pressure. Use and store below $125^{O}F$ ($52^{O}C$).

Route of Entry:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

Health Effects:

Exposure Limits	Irritant	Sensitization
No	No	No
Teratogen	**Reproductive Hazard**	**Mutagen**
No	No	No

Hazards Identification Continued

Synergistic Effects:
None reported

Carcinogenicity: NTP: No IARC: No OSHA: No

Eye Effects:
May cause minor irritation. Contact with rapidly expanding gas near the point of release may cause frostbite.

Skin Effects:
Liquid R-410A can cause a defatting action on the skin. Prolonged or repeated contact may tend to dry and defat skin causing irritation and dermatitis. Contact with rapidly expanding gas near the point of release may cause frostbite with redness, skin color change to gray or white, and blistering.

Ingestion Effects:
None known. Ingestion is unlikely as product is a gas at room temperature.

Inhalation Effects:
High concentrations of R-410A vapors may cause cardiac arrhythmia. Large releases of this product may displace atmospheric oxygen resulting in asphyxiation. Symptoms of asphyxiation include loss of coordination, increased pulse rate and deeper respiration.

Medical Conditions Aggravated by Exposure: None known.

NFPA Hazard Codes		**HMIS Hazard Codes**		**Ratings System**
Health:	0	Health:	0	0: No Hazard
Flammability:	0	Flammability:	0	1: Slight Hazard
Instability:	0	Physical Hazards:	3	2: Moderate Hazard
				3: Serious Hazard
				4: Severe Hazard

Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19 2009 *CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.*

First Aid Measures

Eyes:
Flush eyes with water for 15 minutes. If irritation persists or frostbite occurs, seek medical attention.

Skin:
Rinse skin thoroughly with water. For skin, immerse skin in lukewarm water. DO NOT USE HOT WATER. For frostbite or persistent irritation, seek medical attention.

Ingestion:
None required. Product is a gas at normal temperatures and conditions.

Inhalation:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, and if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Fire Fighting Measures

Conditions of Flammability: Not flammable		
Flash Point: Not Available	Method: Not Available	Autoignition Temperature: Not Available
LEL % None	UEL % None	
Hazardous Combustion Products: Halogens, halogen acids and possibly carbonyl halides		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

Fire and Explosion Hazards:
Nonflammable Cylinders may rupture violently from pressure when involved in a fire situation.

Extinguishing Media:
None required Use as appropriate for surrounding materials.

Fire Fighting Instructions:
If possible, stop the flow of gas supply. Use water spray to cool adjacent cylinders and areas. Fire fighters should wear a full-facepiece NIOSH/MSHA approved self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout gear.

Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or valve, contact the appropriate emergency telephone number listed in section 1 or call your closest Norco/NorLab location.

Handling and Storage

Gas mixture is non-corrosive and may be used with any common structural material.

Use only in well-ventilated areas. Valve protection caps must remain in place unless the cylinder is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure regulator when connecting cylinder to lower pressure (<3000 PSIG) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous backflow into the cylinder.

Protect cylinders from physical damage. Store in cool, dry, well ventilated area of non-combustible construction away from heavy traffic areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125^{O}F (52^{0}C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in – first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Post "NO SMOKING OR OPEN FLAMES" sign in the storage or use area.

For additional recommendations, consult Compressed Gas Association Pamphlet P-1.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid from in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Exposure Controls, Personal Protection

Engineering Controls:
Local exhaust used in combination with general ventilation as necessary to maintain air contaminants at or below acceptable exposure guidelines. Maintain atmospheric oxygen content above 19.5%

Eye/Face Protection:
Safety goggles or glasses as appropriate for the job.

Skin Protection:
Protective gloves.

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Exposure Controls, Personal Protection Continued

Respiratory Protection:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

Other/General Protection:
Safety shoes.

Physical and Chemical Properties

Parameter	Value	Units
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: Above critical temp.	
Vapor density (Air = 1)	: ~ 1	(as air)
Evaporation point	: Not Available	
Boiling point	: Not Available	
Freezing point	: Not Available	
pH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H_2O)	: Slight	
Odor threshold	: Not available	
Odor and appearance	: Colorless gas with a faint sweetish odor.	

Stability and Reactivity

Stability:
Stable

Incompatible Materials:
None

Hazardous Polymerization:
Does not occur.

Toxicological Information

Inhalation:
Acute exposure to moderate to high doses of R-410A can cause headaches, nausea, and irritation of the eyes and respiratory tract.

Ecological Information

Product does not contain any Class I or Class II ozone depleting substances. Not toxic. Will not bioconcentrate. This product contains small amounts of Pentafluoroethane (HFC-125) and Difluoromentane (HFC-32), greenhouse gases which may contribute to global warming.

Disposal Considerations

Do not attempt to dispose of waste or unused quantities in returnable cylinders. Return in the shipping container, properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place, to Norco or NorLab for proper disposal. Non-refillable containers should be vented in a well-ventilated area then disposed of in accordance with local regulations, or returned to NorLab.

Transport Information

Parameter	United States DOT	Canada TDG
Proper Shipping Name:	Compressed gas, N.O.S., (Pentafluoroethane, Nitrogen)	Compressed gas, N.O. S.
Hazard Class:	2.2	2.2
Identification Number:	UN 1956	UN 1956
Shipping Label:	Non-flammable Gas	Non-flammable Gas

Regulatory Information

SARA Title III Notifications and Information:
SARA Title III-Section 313 Supplier Notification
This product contains no toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

SARA Title III – Hazard Classes:
Acute Health Hazard
Sudden Release of Pressure Hazard

California Proposition 65: This product does not contain ingredient(s) known to the State of California to cause cancer or reproductive toxicity.

Additional Regulatory Information:
R-410A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82

Other Information

ACGIH	American Conference of Governmental Industrial Hygienists
DOT	Department of Transportation
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TDG	Transportation of Dangerous Goods
TLV	Threshold Limit Value

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

Disclaimer of Expressed and Implied Warranties:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).