MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME: Refrigerant R-410A (AZ-20)

OTHER/GENERIC NAMES: HFC-R410A; Genetron®AZ-20 (R-410A)

PRODUCT USE: Refrigerant

EXIM TRADING LLC 12601 NW 115TH Ave, Unit 111A, Medley, FL, 33178
(305) 884 7882 (305) 884 7883

FOR EMERGENCY
Medical: 1-800-498-5701
Transportation: Chemtrec 1-800-424-9300
OUTSIDE UNITED STATES, CALL COLLECT 1-352-323-3500

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Difluoromethane (HFC-R32)	75-10-5	50.00
Pentafluoroethane (HFC-R125)	354-33-6	50.00

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:
Warning! Container under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. Gas reduces oxygen available for breathing. Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating. Inhalation may cause central nervous system effects. May cause cardiac arrhythmia. May cause drowsiness and dizziness. Do not breathe vapors. Irritating to eyes and skin. Avoid contact with skin, eyes and clothing. At higher temperatures, (>250°C), decomposition products may include hydrochloric acid (HCl), hydrofluoric acid (HF) and carbonyl halides. The ACGIH Threshold Limit Values (2007) for Hydrogen Fluoride are TLV-TWA 0.5 ppm and Ceiling Exposure Limit 2 ppm.

FORM: Liquefied gas
COLOR: Colorless
ODOR: Weak

POTENTIAL HEALTH HAZARDS

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite. Irritating to skin.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: Gas reduces oxygen available for breathing. When oxygen levels in air are reduced to 12–14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. The victim will not realize that he/she is suffocating. At high levels, cardiac arrhythmia may occur. Vapors may cause drowsiness and dizziness.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None known

Carcinogenicity

No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

4. FIRST AID MEASURES

SKIN:

Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES:

Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INHALATION:

Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give drugs from adrenaline-ephedrine group.

INGESTION:

Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician. Call a physician immediately.

ADVICE TO PHYSICIAN:

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frostbitten areas as needed.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Gas, not applicable per DOT regulations
IGNITION TEMPERATURE:	<750°C (1,382°F)
FLASH POINT METHOD:	Not applicable
UPPER EXPLOSION LIMIT:	None
LOWER EXPLOSION FLAME LIMIT:	None
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

EXTINGUISHING MEDIA:

The product is not flammable. ASHRAE 34. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use any standard agent – choose the one most appropriate for type of surrounding fire.

SPECIFIC HAZARDS DURING FIRE FIGHTING

Contents under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.

Container may rupture on heating. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

In case of fire hazardous decomposition products may be produced such as:

Hydrogen halides	Hydrogen fluoride
Carbon monoxide (CO)	Carbon dioxide (CO_2)
Carbonyl halides	

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

In the event of fire and/or explosion do not breathe fumes. Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment)

Immediately evacuate unprotected personnel to safe areas. Keep people away from and upwind of spill/leak. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid accumulation of vapors in low areas. Unprotected personnel should not return until air has been tested and determined safe. Ensure that the oxygen content is >= 19.5%.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

ENVIRONMENTAL PRECAUTIONS:
Prevent further leakage or spillage if safe to do so. The product evaporates readily.

METHODS FOR CLEANING UP:
Ventilate the area.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment)
Handle with care. Avoid breathing vapors or mist. Avoid liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders. Use authorized cylinders only.

ADVICE ON PROTECTION AGAINST FIRE AND EXPLOSION
The product is not flammable. Can form a combustible mixture with air at pressures above atmospheric pressure.

STORAGE RECOMMENDATIONS:
Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Do not remove screw cap until immediately ready for use. Close valve tightly after use and when empty. Always replace cap after use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE MEASURES:
Do not breathe vapors. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location.

ENGINEERING CONTROLS:
Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

PERSONAL PROTECTIVE EQUIPMENT
SKIN PROTECTION:
Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated,

insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE PROTECTION:
For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:
In case of insufficient ventilation wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. For rescue and maintenance work in storage tanks use self-contained, NIOSH -approved breathing apparatus or supplied air respirator.

HYGIENE MEASURES
Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Keep working clothes separately.

EXPOSURE GUIDELINES

Difluoromethane (HFC-R32)	75-10-5	WEEL	TWA	1,000 ppm	2,200 mg/m^3
Pentafluoroethane (HFC-R125	354-33-6	WEEL	TWA	1,000 ppm	4,900 mg/m^3

9. PHYSICAL AND CHEMICAL PROPERTIES

FORM	:	Liquefied gas
APPEARANCE	:	Clear, colorless vapor
PHYSICAL STATE	:	Gas at ambient temperatures
ODOR	:	Weak
Ph	:	Neutral
BOILING POINT	:	-48.5°C (-55.3°F)
VAPOR PRESSURE	:	14,844 hPa at 21.1°C (70.0°F)
VAPOR PRESSURE	:	33,798 hPa at 54.4°C (129.9°F)
VAPOR DENSITY (air = 1.0)	:	3
DENSITY	:	1.08 g/cm3 at 21.1°C (70.0°F)
WATER SOLUBILITY	:	no data available
PARTITION COEFFICIENT n-octanol/water	:	log Pow: 1.48 – 0.21

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID:

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Decomposes under high temperature. Some risk may be expected of corrosive and toxic decomposition products. Can form a combustible mixture with air at pressures above atmospheric pressure. Do not mix with oxygen or air above atmospheric pressure.

MATERIALS TO AVOID:

- Finely divided aluminum
- Powdered metals
- Zinc
- Potassium
- Aluminum
- Calcium
- Magnesium

HAZARDOUS DECOMPOSITION PRODUCTS:

In case of fire hazardous decomposition products may be produced such as:

- Gaseous hydrogen fluoride (HF)
- Carbon monoxide (CO)
- Carbonyl halides
- Carbon dioxide (CO_2)

THERMAL DECOMPOSITION: >250°C

HAZARDOUS POLYMERIZATION:

Will not occur. Stable under normal conditions

11. TOXICOLOGICAL INFORMATION

ACUTE INHALATION TOXICITY:

Pentafluoroethane	> 769,000 ppm Exposure time: 4 h Species: rat
Difluoromethane:	LC_{50}: > 520,000 ppm Exposure time: 4 h Species: rat

SENSITIZATION:

Pentafluoroethane:	Cardiac sensitization		
	Species:	dogs	
	Note:	No-observed-effect level	75,000 ppm
		Lowest observable effect level	100,000 ppm
Difluoromethane:	Cardiac sensitization		
	Species:	dogs	
	Note:	No-observed-effect level	>350,000 ppm

REPEATED DOSE TOXICITY

Pentafluoroethane: Species: rat

Application Route: Inhalation
Exposure time: (4 Weeks)
NOEL: 50,000 ppm
Subchronic toxicity

Difluoromethane: Species: rat
Application Route: Inhalation
Exposure time: (90 d)
NOEL: 50,000 ppm
Subchronic toxicity

GENOTOXICITY IN VITRO

Pentafluoroethane: Test Method: Ames test
Result: negative

Difluoromethane: Test Method: Ames test
Result: negative

Cell type: Human lymphocytes
Result: negative

Cell type: Chinese Hamster Ovary Cells
Result: negative

Cell type: Human lymphocytes
Result: negative
Method: Mutagenicity (in vitro mammalian cytogenetic test)

Test Method: Chromosome aberration test in vitro
Result: negative

GENOTOXICITY IN VIVO

Difluoromethane: Species: mouse
Cell type: Bone marrow
Method: Mutagenicity (micronucleus test)
Result: negative

TERATOGENICITY

Pentafluoroethane: Species: rabbit
Application Route: Inhalation exposure
NOAEL, Teratog: 50,000 ppm
NOAEL, Maternal: 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.

Species: rat

Application Route: Inhalation exposure
NOAEL, Teratog: 50,000 ppm
NOAEL, Maternal: 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.

Difluoromethane: Species: rat
Dose: NOEL - 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.

Species: rabbit
Dose: NOEL - 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.

Further information: Acute toxicity Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the liquid may cause frostbite. May cause cardiac arrhythmia.

12. ECOLOGICAL INFORMATION

Biodegradability Pentafluoroethane:
Result: Not readily biodegradable.
Value: 5 %
Method: OECD 301 D

Difluoromethane: Note: Minimal

FURTHER INFORMATION ON ECOLOGY

Additional ecological information: This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.
This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere.
To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

13. DISPOSAL CONSIDERATIONS

Waste Information: Observe all Federal, State, and Local Environmental regulations. The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method. Use only approved transporters, recyclers, storage or disposal facilities.

Additional advice:	This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

14. TRANSPORT INFORMATION

DOT	Proper shipping name	:	LIQUEFIED GAS, N.O.S.
	UN/ID No.	:	3163
	Class	:	2.2
	Packing group	:	
IATA	UN/ID No.	:	3163
	Description of the goods	:	LIQUEFIED GAS, N.O.S. (Chlorodifluoromethane, 1,1,1-Trifluoroethane, Pentafluoroethane)
	Class	:	2.2
	Hazard Labels	:	2.2
	Packing instruction (cargo aircraft)	:	200
	Packing instruction (passenger aircraft)	:	200
IMDG	UN/ID No.	:	UN 3163
	Description of the goods	:	LIQUEFIED GAS, N.O.S. (Chlorodifluoromethane, 1,1,1-Trifluoroethane, Pentafluoroethane)
	Class	:	2.2
	Hazard Labels	:	2.2
	EmS Number	:	F-C
	Marine pollutant	:	No

15. REGULATORY INFORMATION

INVENTORIES

EU. EINECS	:	This mixture contains only ingredients which have been subject to a pre-registration according to Regulation (EC) No. 1907/2006 (REACH).
US. Toxic Substances Control Act	:	On TSCA Inventory
Australia. Industrial Chemical (Notification and Assessment) Act	:	On or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	:	All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	:	On or in compliance with the inventory
Korea. Toxic Chemical Control Law (TCCL) List	:	On or in compliance with the inventory
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	:	On or in compliance with the inventory
China. Inventory of Existing Chemical Substances	:	On or in compliance with the inventory
NZIOC - **New Zealand**	:	On or in compliance with the inventory

NATIONAL REGULATORY INFORMATION

SARA 311/312 Hazards	:	Acute Health Hazard Sudden Release of Pressure Hazard
California Prop. 65	:	Difluoromethane is not found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC, and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.
WHMIS Classification	:	A
Global warming potential	:	1,975
Ozone depletion potential (ODP)	:	0

16. OTHER INFORMATION

	Health Hazard	Flammability	Physical Hazard	Instability
HMIS Classification	1	1	0	
NFPA Classification	2	1		0

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