



Material Safety Data Sheet

R -404A

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : TAB-00103

Product Use

Refrigerant

Trade names and Synonyms

R-404A
HP62

Company Identification

TABRIGAS EGYPT – PACKAGER / DISTRIBUTOR

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
1, 1, 1-TRIFLUOROETHANE (HFC 143a)	420-46-2	52 %
PENTAFLUOROETHANE (HFC 125)	354-33-6	44 %
1, 1, 1, 2-TETRAFLUOROETHANE (HFC 134a)	811-97-2	4 %

HAZARDS IDENTIFICATION

Emergency Overview

Misuse or intentional inhalation abuse may lead to death without warning.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Rapid evaporation of the liquid may cause frostbite

Potential Health Effects

Skin

Contact with liquid or refrigerated gas can cause cold burns and frostbite.
May cause skin irritation.
May cause: Discomfort, itching, redness, or swelling.

Eyes

Contact with liquid or refrigerated gas can cause cold burns and frostbite.
May cause eye irritation.
May cause: tearing, Redness, Discomfort.

Inhalation

Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.
Other symptoms potentially related to misuse or inhalation abuse are:



Anesthetic effects, Light-headedness, dizziness, confusion, in coordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness.

Vapours are heavier than air and can cause suffocation by reducing oxygen

Available for breathing.

Carcinogenicity

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

FIRST AID MEASURES

First Aid

Skin contact

Take off all contaminated clothing immediately. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.

Eye contact

Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Inhalation

Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Call a physician.

Ingestion

Is not considered a potential route of exposure

General advice

Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

Notes to physician

Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : does not flash
Lower explosion limit : Method: None per ASTM E681
Upper explosion limit : Method: None per ASTM E681
Fire and Explosion Hazard :

Cylinders are equipped with pressure and temperature relief devices, but may still rupture under fire conditions. Decomposition may occur. Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of the torch flame. This flame effect will only occur in concentrations of product well above the recommended exposure

limit. Therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames.

This substance is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible 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). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes. Experimental data have also been reported which indicate combustibility of this substance in the presence of certain concentrations of chlorine.

Suitable extinguishing media

: As appropriate for combustibles in area. Extinguishant for other burning material in area is sufficient to stop burning.

Firefighting Instructions

: Use water spray or fog to protect the fire fighters and to cool container. Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions. Water runoff should be contained and neutralized prior to release.

ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safeguards (Personnel)

Ventilate area, especially low or enclosed places where heavy vapors might collect.

Accidental Release Measures

Avoid open flames and high temperatures. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

HANDLING AND STORAGE

Handling (Personnel)

Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing.

Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8. Handle in accordance with good industrial hygiene and safety practice.



Storage

Valve protection caps and valve outlet threaded plugs must remain in place unless container 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 reducing regulator when connecting cylinder to lower pressure (>3000 psig) piping or systems. Never attempt to lift cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Keep at temperature not exceeding 52°C. Do not store near combustible materials. Avoid area where salt or other corrosive materials are present.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

Personal Protective Equipment

Respiratory protection

Under normal manufacturing conditions, no respiratory protection is required when using this Product.

Hand protection

Material: Impervious gloves

Eye protection

Wear safety glasses with side shields. Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

Protective measures

Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Exposure Limit Values

1, 1, 1-Trifluoroethane			
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA
Pentafluoroethane			
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA
1, 1, 1, 2-Tetrafluoroethane			
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL AND CHEMICAL PROPERTIES

Form	: Liquefied gas
Color	: colorless
Odor	: slight, ether-like
Boiling point/boiling range	: -45.5 °C (-49.9 °F)
% Volatile	: 100 %
Vapor Pressure	: 12,546 hPa at 25 °C (77 °F)
Specific gravity	: 1.05 at 25 °C (77 °F)
Water solubility	: not determined
Evaporation rate	: > 1 (CCL4=1.0)

STABILITY AND REACTIVITY

Stability

Stable at normal temperatures and storage conditions.

Conditions to Avoid

Avoid open flames and high temperatures.

Incompatibility

Alkali metals Alkaline earth metals, Powdered metals, Powdered metal salts

Hazardous decomposition products

Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride. These materials are toxic and irritating. Avoid contact with decomposition products

Hazardous reactions

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

R-404A refrigerant

Further information:

Rapid evaporation of the liquid may cause frostbite. May cause cardiac arrhythmia.

1, 1, 1-Trifluoroethane (HFC-143a)

Dermal:

Not applicable.

Oral:

Not applicable

Inhalation 4 h LC50:

> 540000 ppm , rat Anesthetic effects



Inhalation 4 h LC50:
591000 ppm , rat

Inhalation:
Dog Cardiac sensitization.

Skin irritation:
No skin irritation, Not tested on animals
Not expected to cause skin irritation based on expert review of the properties of the substance.

Eye irritation:
No eye irritation, Not tested on animals
Not expected to cause eye irritation based on expert review of the properties of the substance.

Skin sensitization:
Not tested on animals
Not expected to cause sensitization based on expert review of the properties of the substance.
There are no reports of human respiratory sensitization.

Repeated dose toxicity:
Inhalation rat No toxicologically significant effects were found.

Carcinogenicity:
Animal testing did not show any carcinogenic effects.

Mutagenicity:
Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.
Did not cause genetic damage in cultured bacterial cells.

Teratogenicity:
Animal testing showed no developmental toxicity.

Pentafluoroethane (HFC-125)

Dermal:
not applicable

Oral:
not applicable

Inhalation 4 h LC50:
> 800000 ppm , rat

Inhalation:
Dog Cardiac sensitization

Skin irritation:
No skin irritation, Not tested on animals
Not expected to cause skin irritation based on expert review of the properties of the substance.

Eye irritation:
No eye irritation, Not tested on animals
Not expected to cause eye irritation based on expert review of the properties of the substance.

Skin sensitization:

Does not cause skin sensitization. Not tested on animals
Not expected to cause sensitization based on expert review of the properties of the substance.

Repeated dose toxicity:

Inhalation rat
No toxicologically significant effects were found.

Mutagenicity:

Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.
Did not cause genetic damage in cultured bacterial cells.

Reproductive toxicity:

Evidence suggests the substance is not a reproductive toxin in animals.
Information given is based on data obtained from similar substances.

Teratogenicity:

Animal testing showed no developmental toxicity.

1, 1, 1, 2-Tetrafluoroethane (HFC-134a)

Dermal:

Not applicable

Oral:

Not applicable

Inhalation 4 h LC50:

567000 ppm , rat

Inhalation:

Dog Cardiac sensitization

Skin irritation:

Slight irritation, rabbit
Not expected to cause skin irritation based on expert review of the properties of the substance.
No skin irritation, human

Eye irritation:

Slight irritation, rabbit
Not expected to cause eye irritation based on expert review of the properties of the substance.
No eye irritation, human

Skin sensitization:

Did not cause sensitization on laboratory animals., guinea pig
Not expected to cause sensitization based on expert review of the properties of the substance.
Did not cause sensitization on laboratory animals. There are no reports of human respiratory sensitization.

Repeated dose toxicity:

Inhalation rat
No toxicologically significant effects were found.

Carcinogenicity:

Overall weight of evidence indicates that the substance is not carcinogenic.
An increased incidence of benign tumors was observed in laboratory animals.

Mutagenicity:

Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.
Did not cause genetic damage in cultured bacterial cells.

Reproductive toxicity:

Animal testing showed no reproductive toxicity.

Teratogenicity:

Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

ECOLOGICAL INFORMATION

Aquatic Toxicity**1,1,1-Trifluoroethane (HFC-143a)****96 h LC50:**

Oncorhynchus mykiss (rainbow trout) > 100 mg/l
not applicable

48 h EC50:

Daphnia 300 mg/l

Pentafluoroethane (HFC-125)**96 h LC50:**

Danio rerio (zebra fish) > 200 mg/l
Information given is based on data obtained from similar substances.

96 h LC50:

Oncorhynchus mykiss (rainbow trout) 450 mg/l
Information given is based on data obtained from similar substances.

72 h EC50:

Pseudokirchneriella subcapitata (green algae) > 114 mg/l
Information given is based on data obtained from similar substances.

96 h EC50:

Algae 142 mg/l
Information given is based on data obtained from similar substances.

48 h EC50:

Daphnia magna (Water flea) > 200 mg/l
Information given is based on data obtained from similar substances.

48 h EC50:

Daphnia magna (Water flea) > 97.9 mg/l
Information given is based on data obtained from similar substances.



1, 1, 1, 2-Tetrafluoroethane (HFC-134a)

96 h LC50:

Oncorhynchus mykiss (rainbow trout) 450 mg/l

72 h EC50:

Algae > 118 mg/l

Information given is based on data obtained from similar substances.

48 h EC50:

Daphnia magna (Water flea) 980 mg/l

Environmental Fate

1, 1, 1-Trifluoroethane (HFC-143a)

Biodegradability:

Not readily biodegradable.

DISPOSAL CONSIDERATIONS

Waste Disposal:

Can be used after re-conditioning. Recover by distillation or remove to a permitted waste disposal facility. Comply with applicable Federal, State/Provincial and Local Regulations.

Environmental Hazards:

Empty pressure vessels should be returned to the supplier.

TRANSPORTATION INFORMATION

TDG_ROAD	UN number	: 3337
	Proper shipping name	: Refrigerant gas R 404A
	Class	: 2.2
	Labeling No.	: 2.2
TDG_RAIL	UN number	: 3337
	Proper shipping name	: Refrigerant gas R 404A
	Class	: 2.2
	Labeling No.	: 2.2
IATA_C	UN number	: 3337
	Proper shipping name	: Refrigerant gas R 404A
	Class	: 2.2
	Labeling No.	: 2.2
IMDG	UN number	: 3337
	Proper shipping name	: Refrigerant gas R 404A
	Class:	2.2
	Labeling No.	: 2.2



REGULATORY INFORMATION

DSL Status:

On the inventory, or in compliance with the inventory

TSCA Status:

On the inventory, or in compliance with the inventory

WHMIS Classification:

A - Compressed Gas

Remarks:

One or more components of this product are subject to a Significant New Activity (SNAc) restriction under the Canadian Environmental Protection Act (CEPA). This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

End of MSDS