

Revised date 01.08.2024

## MATERIAL SAFETY DATA SHEET

### HFC 404A

#### CHEMICAL PRODUCT

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Corporate MSDS Number : TAB-003008  
Composition : HFC 404A (100%)  
Chemical Formula : CHF<sub>2</sub>CF<sub>3</sub> + CH<sub>2</sub>FCF<sub>3</sub> + CH<sub>3</sub>CF<sub>3</sub>  
Chemical Name : Pentafluoroethane + 1,1,1,2-tetrafluoroethane + 1,1,1-trifluoroethane  
Composition : HFC 125 (44.0%) + HFC 134a (4.0%) + HFC 143a (52.0%)  
CAS# : 354-33-6 + 811-97-2 + 420-46-2  
UN# : 337  
HS Code : 382761  
Hazard : 2.2

#### COMPANY IDENTIFICATION

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TABRIGAS Egypt  
Port Said Free Zone area - Egypt  
Sunday - Thursday (9:00 - 17:00)  
00 202 2734 22 77 / 78 / 79  
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#### PRODUCT USE

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Refrigerant

#### TRADE NAMES & SYNONYMS

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R-404A  
HFC 404A  
HP 62

#### HAZARDS IDENTIFICATION

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##### Emergency Overview

Misuse or intentional inhalation abuse may lead to death without warning. Vapors 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

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**Skin**

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

**Eyes**

Contact with liquid or refrigerated gas can cause cold burns and frostbite. It may cause eye irritation. May cause: tearing, Redness, and 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 include light-headedness, dizziness, confusion, coordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, fainting, dizziness, or weakness. Vapors 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**

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**First Aid**

**Skin contact**

Take off all contaminated clothing immediately. Flush the 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, and lie down. Move to fresh air. Keep the 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.

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**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**

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**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 becomes 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 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 the combustibility of this substance in the presence of certain concentrations of chlorine.

**Suitable extinguishing media**

: As appropriate for combustibles in the area. Extinguishing agents from other burning material in the area is sufficient to stop burning.

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**Firefighting Instructions**

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

**ACCIDENTAL RELEASE MEASURES**

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

**Accidental Release Measures**

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

**HANDLING AND STORAGE**

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**Handling (Personnel)**

Avoid breathing vapors 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 under good industrial hygiene and safety practices.

**Storage**

Valve protection caps and valve outlet threaded plugs must remain in place unless the container is secured with a valve outlet piped to the use point. Do not drag, slide, or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure-reducing regulator when connecting the cylinder to lower-pressure (> 3000 PSIG) piping or systems. Never attempt to lift the cylinder by its cap. Use a check valve or trap in the discharge line to prevent hazardous backflow 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 a temperature not exceeding 52°C. Do not store near combustible materials. Avoid areas where salt or other corrosive materials are present.

**EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**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 the use of torches or other open flames, or if employees are entering enclosed areas.

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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 of face contact due to splashing, spraying or airborne contact with this material.

Protective measures

A 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 |
| Pentafluoro ethane           |          |           |                |
| 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 that are lower than the AEL are in effect, such limits shall take precedence.

**PHYSICAL AND CHEMICAL PROPERTIES**

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|                             |                               |
|-----------------------------|-------------------------------|
| 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)              |

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## STABILITY AND REACTIVITY

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### 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

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### 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.

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Skin irritation:

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

Skin sensitization:

Not tested on animals Not expected to cause sensitization based on an 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.

Pentafluoro ethane (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.

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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

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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**

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**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  
Pentafluoro ethane (HFC-125)

**96 h LC50:**

Danio ratio (zebra fish) > 200 mg/l

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The information given is based on data obtained from similar substances.

96 h LC50:

Oncorhynchus mykiss (rainbow trout) 450 mg/l

The information given is based on data obtained from similar substances.

72 h EC50:

Pseudokirchneriella subcapitata (green algae) > 114 mg/l

The 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

The information given is based on data obtained from similar substances.

48 h EC50:

Daphnia magna (Water flea) > 97.9 mg/l

The 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

The 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

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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.

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## Environmental Hazards:

Empty pressure vessels should be returned to the supplier.

**TRANSPORTATION INFORMATION**

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|          |                      |                          |
|----------|----------------------|--------------------------|
| 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**

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## 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 per the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

End of MSDS  
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