

Material Safety Data Sheet

R -422D

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Corporate MSDS Number : TAB-00124

Product Use

Refrigerant

Trade names and Synonyms

R-422D

MO29

Isceon® MO29

Company Identification

TABRIGAS EGYPT – PACKAGER / DISTRIBUTOR

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Pentafluoroethane (HFC-125))	354-33-6	65.7 %
1, 1, 1, 2-Tetrafluoroethane (HFC-134a))	811-97-2	32.5 %
1Isobutane (<0.1% butadiene)	75-28-5	3.4 %

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.

Eyes

Contact with liquid or refrigerated gas can cause cold burns and frostbite.

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.

Target Organs

Isobutene (<0.1% butadiene) : Central nervous system

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

Wash off with warm water. Take off all contaminated clothing immediately.

Eye contact

Rinse immediately with plenty of water and seek medical advice.

Inhalation

Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be Necessary.

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.

Firefighting Instructions

: In the event of fire, wear self-contained breathing apparatus. Wear neoprene gloves during cleaning up work after a fire.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Cool containers / tanks with water spray.

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)

Evacuate personnel to safe areas.

Spill Cleanup

Ventilate area using forced ventilation, especially low or enclosed places where heavy vapors might collect. Recover free liquid for reuse or reclamation.

Accidental Release Measures

Prevent material from entering sewers, waterways, or low areas.

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.

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. 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. Keep container tightly closed in a dry and well-ventilated place. Store in original container. Protect from contamination. No materials to be especially mentioned.

Storage temperature
 < 52 °C (< 126 °F)

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released.

Personal Protective Equipment

Respiratory protection

For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Hand protection

Additional protection: Impervious gloves

Eye protection

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

Exposure Guidelines

Exposure Limit Values

Pentafluoroethane			
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA
1, 1, 1, 2-Tetrafluoroethane			
AEL *	(DUPONT)	1,000 ppm	8 & 12 hr. TWA
Isobutene (<0.1% butadiene)			
TLV	(ACGIH)	1,000 ppm	TWA
TLV	(ACGIH)	1,000 ppm	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
pH	: neutral
Boiling point	: -43 °C (-45 °F)
% Volatile	: 100 %
Vapor Pressure	: 12,200 hPa at 25 °C (77 °F)
Density (as liquid)	: 1.157 g/cm ³ at 25 °C (77 °F)
Specific gravity	: 1.15 at 25 °C (77 °F)
Water solubility	: 5 g/l at 25 °C (77 °F)
Vapor density	: 3.9 at 25°C (77°F) and 1013 hPa (Air=1.0)

STABILITY AND REACTIVITY

Stability

Stable at normal temperatures and storage conditions.

Conditions to Avoid

The product is not flammable in air under ambient conditions of temperature and pressure. When pressurized with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions. Avoid open flames and high temperatures.

Incompatibility

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

Hazardous decomposition products

Hazardous thermal decomposition products:: Carbon oxides, Hydrogen fluoride, Carbonyl fluoride

TOXICOLOGICAL INFORMATION

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.

Carcinogenicity

Overall weight of evidence indicates that the substance is not carcinogenic.

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.

Further information

Cardiac sensitization threshold limit : 490000 mg/m³

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 tumours 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.

Further informationCardiac sensitization threshold limit : 312975 mg/m³**Isobutene (<0.1% butadiene)****Dermal:**

Not applicable

Oral:

Not applicable

Inhalation 4 h LC50:

276808 ppm , rat

The toxicological data has been taken from products of similar composition.

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.

Mutagenicity :

Did not cause genetic damage in animals.

Did not cause genetic damage in cultured bacterial cells.

ECOLOGICAL INFORMATION

Aquatic Toxicity

Pentafluoroethane (HFC-125)

96 h LC50:

Oncorhynchus mykiss (rainbow trout) > 81.8 mg/l

Information given is based on data obtained from similar substances.

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) > 118 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

DISPOSAL CONSIDERATIONS

Waste Disposal:
Can be used after re-conditioning.

Environmental Hazards:
Empty pressure vessels should be returned to the supplier.

TRANSPORTATION INFORMATION

TDG_ROAD	UN number	: 1078
	Proper shipping name	: Refrigerant gas, n.o.s. (1, 1, 1, 2-Tetrafluoroethane, Pentafluoroethane)
	Class	: 2.2
	Labeling No.	: 2.2

TDG_RAIL	UN number	: 1078
	Proper shipping name	: Refrigerant gas, n.o.s. (1, 1, 1, 2-Tetrafluoroethane, Pentafluoroethane)
	Class	: 2.2
	Labeling No.	: 2.2

IATA_C	UN number	: 1078
	Proper shipping name	: Refrigerant gas, n.o.s. (1, 1, 1, 2-Tetrafluoroethane, Pentafluoroethane)
	Class	: 2.2
	Labeling No.	: 2.2

IMDG	UN number	: 1078
	Proper shipping name	: Refrigerant gas, n.o.s. (1, 1, 1, 2-Tetrafluoroethane, Pentafluoroethane)
	Class	: 2.2
	Labeling No.	: 2.2

REGULATORY INFORMATION

DSL 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).