MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT Name: D-Gas R 410A

Manufacturer/Distributor: Derkim Kimya San. ve Tic. A.S.

Address/Phone No.: Mahmutbey Mah. 2412. Sok. C Blok Plaza No:2/91-94 Bagcılar/İstanbul

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Subject to Member State regulations, applicable uses are: refrigerant

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
pentafluoroethane (HFC-125)	354-33-6	50	Y
difluoromethane (HFC-32)	75-10-5	50	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to thecriteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Clear, Colorless liquid and vapor with a faint etheral odor.

WARNING!

LIQUID AND GAS UNDER PRESSURE, OVERHEATING AND OVERPRESSURIZING MAY CAUSE GAS RELEASEOR VIOLENT CYLINDER BURSTING. MAY DECOMPOSE ON CONTACT WITH FLAMES OR EXTREMELY HOTMETAL SURFACES TO PRODUCE TOXIC AND CORROSIVE PRODUCTS. VAPOR REDUCES OXYGENAVAILABLE FOR BREATHING AND IS HEAVIER THAN AIR. HARMFUL IF INHALED AND MAY CAUSE HEARTIRREGULARITIES, UNCONSCIOUSNESS OR DEATH. LIQUID CONTACT WITH EYES OR SKIN MAY CAUSEFROSTBITE.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. As withmost liquified gases, contact with the rapidly volatilizing liquid can cause frostbite to any tissue. High vapor

concentrations are irritating to the eyes and respiratory tract and may result in central nervous system (CNS) effectssuch as headache, dizziness, drowsiness and, in severe exposure, loss of consciousness and death. The dense vaporof this material may reduce the available oxygen for breathing. Prolonged exposure to an oxygen-deficient atmospheremay be fatal. Inhalation may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats. Medical conditions aggravated by exposure to this material include heart disease orcompromised heart function.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water. Get medical attention if irritation persists.

IF ON SKIN, Flush exposed skin with lukewarm water (not hot), or use other means to warm skin slowly. Getmedical attention if frostbitten by liquid or if irritation occures.

IF SWALLOWED, Not applicable - product is a gas at ambient temperatures.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, giveoxygen. Get medical attention. Do not give adrenaline, epinephrin or similar drugs following exposure to this product.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature NE

Flash Point NA - Gas Flash Point Method

Flammable Limits- Upper NONE

Lower NONE

Extinguishing Media

Use extinguishing media appropriate to surrounding fire conditions.

Fire Fighting Instructions

Stop the flow of gas if possible. Use water spray on person making shut-off. Fire fighters and others who maybe exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipmentshould be thoroughly decontaminated after use.

Fire and Explosion Hazards

May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosiveproducts. Liquid and gas under pressure, overheating or overpressurizing may cause gas release and/or violentcylinder bursting. Container may explode if heated due to resulting pressure rise. Some mixtures of HCFCsand/or HFCs, and air or oxygen may be combustible if pressurized and exposed to extreme heat or flame.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep upwind.

Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation. Exhaust vapors outdoors.

Do not smoke or operate internal combustion engines. Remove flames and heating elements.

7 HANDLING AND STORAGE

Handling

Avoid breathing gas. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Do not enter confined spaces unless adequately ventilated.

Storage

Do not apply direct flame to cylinder. Do not store cylinder in direct sun or expose it to heat above 120 F.

Do not drop or refill this cylinder. Keep away from heat, sparks and flames.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation

if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing gas. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components (full facepiece recommended). Consult respirator manufacturer to determine appropriate type

equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit Value

pentafluoroethane (HFC-125)

WEEL TWA - 4900 mg/m3 1000 ppmdifluoromethane (HFC-32)

WEEL TWA - 2200 mg/m3 1000 ppm

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate

exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor Clear, Colorless liquid and vapor with a faint etheral odor.

pH NE

Specific Gravity 1.06 @ 25 C

Vapor Pressure (BUBBLE) 213.9 PSIA @ 21.1C (70 F)

Vapor Density (AIR = 1) 2.52

Melting Point NE

Freezing Point NE

Boiling Point - 52.8 C

Solubility In Water Unknown

Molecular Weight 72.59

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under specified conditions or storage, shipment and/or use. See

HANDLING AND STORAGE section of this MSDS for specified conditions.

Incompatibility

Avoid contact with strong alkali or alkaline earth metals, finely powdered metals such as aluminum, magnesiumor zinc and strong oxidizers, since they may react or accelerate decomposition.

Hazardous Decomposition Products

Thermal decomposition products could include Halogen acid (HF), Carbon monoxide, Carbon dioxide, andCarbonyl halide.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

Ethane, pentafluoro-

Inhalation followed by intravenous injection of epinephrine to simulate stress reactions resulted in cardiacsensitization in dogs. Following repeated inhalation exposure, no adverse effects were observed in rats. Nobirth defects were noted in the offspring of rats or rabbits exposed by inhalation during pregnancy. No geneticchanges were observed in tests using bacteria, animal cells or animals. Single exposure (acute) studiesindicate:

Inhalation - Practically Non-toxic to Rats (4-hr LC50 >800,000 ppm)

Methane, difluoro-

Inhalation of this material, followed by intravenous injection of epinephrine to simulate stress reactions, resultedin cardiac sensitization in dogs. Acute inhalation of high concentrations has produced an anesthetic effect inrats. Following repeated inhalation exposure, no adverse effects were observed in rats. No birth defects werenoted in the offspring of rats or rabbits exposed by inhalation during pregnancy, even at dosages whichproduced significant adverse effects in the mother. No genetic changes were observed in tests using bacteria,animal cells or animals. Single exposure (acute) studies indicate:

Inhalation - Practically Non-toxic to Rats (4-hr LC50 >520,000 ppm)

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

No data are available.

Chemical Fate Information

Ethane, pentafluoro-

When released into the environment, this material is expected to partition almost exclusively into the atmosphere. Based on its low n-octanol/water partition coefficient (log Pow 1.48), bioaccumulation isconsidered unlikely. In a 28-day ready biodegradability closed bottle test, it appeared to be stable (about 10%degraded). This material does not dissociate in water.

Methane, difluoro-

The log Pow for this material is 1.62 indicating a low bioconcentration factor. In a 28-day ready biodegradabilityclosed bottle test, this material appeared to be stable.

13DISPOSAL CONSIDERATIONS

Waste Disposal

Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations.Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and localwaste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14TRANSPORT INFORMATION

DOT Name Liquefied Gas NOS

DOT Technical Name (Pentafluoroethane, Difluoromethane)

DOT Hazard Class 2.2

UN Number UN 3163

DOT Packing Group PG NA

RQ

15REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health Y Fire N

Delayed (Chronic) Health N Reactive N

Sudden Release of Pressure Y

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

difluoromethane (HFC-32)

Pennsylvania Environmental Hazard

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

difluoromethane (HFC-32)

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the

Pennsylvania Hazardous Substance List.

difluoromethane (HFC-32)

16.OTHER INFORMATION

This information applies to the product as such and conforming to specifications of Derkim Kimya San. ve Tic. A.S.

In case of formulations or mixtures, it is necessary to ascertain that a new danger will not appear. The information contained is based on our knowledge of the product, at the date of publishing and it is given quite sincerely. However the revision of some data is in progress.
Users are advised of possible additional hazards when the product is used in applications for which it was not intended. This sheet shall only be used and reproduced for prevention and security purposes. The references to legislative, regulatory and codes of practice documents cannot be considered as exhaustive.

It is the responsibility of the person receiving the product to refer to the totality of the official documents concerning the use, the possession and the handling of the product.
It is also the responsibility of the handlers of the product to pass on to any subsequent persons who will come into contact with the product (usage, storage, cleaning of containers, other processes) the totality of the information contained within this safety data sheet and necessary for safety at work, the protection of health and the protection of environment.