

ACCORDING TO US CFR 1910.1200

1. SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product Name	R-401A
Synonym(s)	REFRIGERANT GAS MIX.
CAS No.	Mixture.
EC No.	Mixture.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified Use(s)	Refrigerant.
Uses Advised Against	Not known.

1.3 Details of the supplier of the safety data sheet

Company Identification	Hudson Technologies Company
Address	PO Box 1541 One Blue Hill Plaza Pearl River, New York USA
Postal code	10965
Telephone	+1 (800) 953 2244
Fax	+1 (845) 512 6070
E-mail	information@hudsontech.com

1.4 Emergency telephone number

Company	+1 (800) 501 4376
CHEMTREC (U.S.)	+1 (800) 424 9300
INTERNATIONAL	+1 (703) 527 3887

2. SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

US CFR 1910.1200	Gases under pressure; Press. Gas; Liquefied gas. Ozone 1; Harms public health and the environment by destroying ozone in the upper atmosphere.
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2.2 Label elements

Product Name Liquefied Gas N.O.S. (Chlorodifluoromethane and Chlorotetrafluoroethane) (R-401A)

Hazard Pictogram(s)



GHS04



GHS07

Signal Word(s) Warning.

Hazard Statement(s) H280: Contains gas under pressure; may explode if heated.
H420: Harms public health and the environment by destroying ozone in the upper atmosphere.
OSHA-H01: MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.

Precautionary Statement(s) P202: Do not handle until all safety precautions have been read and understood.
P261: *Avoid breathing gas.
P262: Do not get in eyes, on skin, or on clothing.
P304, P340, P313: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
P410+P403: Protect from sunlight. Store in a well-ventilated place.
P502: Refer to manufacturer for information on recovery/recycling.

2.3 Other hazards

May cause asphyxiation when concentrations are sufficient to reduce oxygen below safe breathing levels.
May cause frost-bite.

2.4 Additional Information

CGA-PG05: Use a back flow preventive device in the piping.
CGA-PG10: Use only with equipment rated for cylinder pressure.
CGA-PG06: Close valve after each use and when empty.
CGA-PG02: Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).
CGA-PG27: Read and follow the Safety Data Sheet (SDS) before

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

5. SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing media As appropriate for surrounding fire.

Unsuitable extinguishing media None.

5.2 Special hazards arising from the substance or mixture

Contains gas under pressure; may explode if heated. The product should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. Decomposes in a fire giving off toxic fumes: Hydrochloric acid, Hydrofluoric acid, Carbonyl halides, Oxides of carbon.

5.3 Advice for fire-fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. If it is safe to do so, containers should be removed from fire area because they are likely to rupture under fire conditions. Keep containers cool by spraying with water if exposed to fire.

6. SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area. Shut off leaks if without risk. Ensure adequate ventilation. Wear appropriate personal protective equipment, avoid direct contact.

6.2 Environmental precautions

Do not allow to enter drains, sewers or watercourses. Spills and releases may have to be reported to Federal and/or local authorities.

6.3 Methods and material for containment and cleaning up

Allow small spillages to evaporate provided there is adequate ventilation. Ventilate area using forced ventilation, especially low or enclosed places where heavy vapours might collect.

6.4 Reference to other sections

See Also Section 8, 13.

7. SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Provide sufficient ventilation. Avoid breathing gas. Avoid contact with skin and eyes. Wear protective gloves/protective clothing/eye protection/face protection. Do not drag, roll, slide or drop cylinders. Use a suitable hand truck design for cylinder movement. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object into valve cap openings. Doing so may damage valve causing a leak to occur. Secure cylinders in an upright position at all times, close all valves when not in use. Keep closed even when empty. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

7.2 Conditions for safe storage, including any incompatibilities

Protect from sunlight. Store in a well-ventilated place.

Storage temperature

<125°F (52°C)

Storage life

Stable under normal conditions.

Incompatible materials

Strong oxidizing agents, Chlorine, Powdered Aluminium, Magnesium and Zinc.

8. SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational Exposure Limits

SUBSTANCE.	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Chlorodifluoromethane (R-22)	75-45-6	1000	3540			TLV (ACGIH)
1,1-difluoroethane (R-152A)	75-37-6	1000				AIHA

Remark

TLV: Threshold Limit Value (ACGIH)
Workplace Environmental Exposure Level (AIHA)

8.2 Exposure controls

Appropriate engineering controls Ensure adequate ventilation.

Personal protection equipment



Eye Protection

Wear eye/face protection.



Skin protection

Wear suitable gloves.



Respiratory protection

Where engineering controls are not fitted or inadequate wear suitable respiratory protective equipment. A suitable mask with filter type A may be appropriate.

Thermal hazards

Not applicable.

9. SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Gas.
	Color: Colorless.
Odor	Ether-like.
Odor threshold	Not established.
pH	Neutral.
Melting point/freezing point	Not applicable.
Initial boiling point and boiling range	-27°F (-33°C)
Flash Point	Not applicable.
Evaporation rate	>1 (CCl4=1.0)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	Not applicable.
Vapor pressure	112.1 psia @ 77°F (25°C)
Vapor density	3.3 @ 77°F (25°C) (Air = 1)
Density (g/ml)	Not available.
Relative density	Not available.



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Solubility(ies)	Solubility (Water): 0.1 WT% @ 77°F (25°C) Solubility (Other): Not available.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not applicable.
Decomposition Temperature (°C)	Not available.
Viscosity	Not applicable.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
9.2 Other information	
Percent Volatile (%)	100%

10. SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

Stable under normal conditions.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions known if used for its intended purpose.

10.4 Conditions to avoid

Keep away from heat and direct sunlight.

10.5 Incompatible materials

Strong oxidizing agents, Chlorine, Powdered Aluminium, Magnesium and Zinc.

10.6 Hazardous decomposition product(s)

Halogens, halogen acids and possibly carbonyl halides.

11. SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity - Ingestion Low acute toxicity.

Acute toxicity - Skin Contact Low acute toxicity.

Acute toxicity - Inhalation	Low acute toxicity. Chlorodifluoromethane: LC50 (6h) (mouse): >150,000 ppm
Skin corrosion/irritation	Liquid contact can cause severe irritation and frostbite.
Serious eye damage/irritation	Liquid contact can cause severe irritation and frostbite.
Skin sensitization data	Not classified.
Respiratory sensitization data	Not classified.
Germ cell mutagenicity	There is no evidence of mutagenic potential.
Carcinogenicity	No evidence of carcinogenicity.
Reproductive toxicity	Not classified.
Lactation	Not classified.
STOT - single exposure	None anticipated.
STOT - repeated exposure	None anticipated.
Aspiration hazard	Not classified.
11.2 Other information	Not known.

12. SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity - Aquatic invertebrates	Low toxicity to invertebrates. Chlorodifluoromethane: EC50 (48 hour) (Daphnia magna): 433mg/l
Toxicity - Fish	Low toxicity to fish.
Toxicity - Algae	Low toxicity to algae.
Toxicity - Sediment	Not classified.
Compartment	
Toxicity - Terrestrial	Not classified.
Compartment	

12.2. Persistence and Degradation

The product is not biodegradable.
Chlorodifluoromethane: Not readily biodegradable.

12.3. Bioaccumulative potential

The product has low potential for bioaccumulation.
Chlorodifluoromethane: Log Kow < 4

12.4. Mobility in soil

Not applicable.

12.5 Other adverse effects

Harms public health and the environment by destroying ozone in the upper atmosphere.

13. SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Containers must not be punctured or destroyed by burning, even when empty. Refer to manufacturer/supplier for information on recovery/recycling.

13.2 Additional Information

Disposal should be in accordance with local, state or national legislation.

R-401A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

14. SECTION 14: TRANSPORT INFORMATION

14.1 UN number

UN No. 3163

14.2 UN proper shipping name

UN proper shipping name LIQUEFIED GAS, N.O.S. (CHLORODIFLUOROMETHANE, 2-CHLORO- 1,1,1,2-TETRAFLUOROETHANE).

14.3 Transport hazard class(es)

ADR/RID Class 2.2
IMDG Class 2.2
IMDG EMS Not available.

ICAO/IATA

Excepted Quantities E1

Passenger and Cargo Aircraft

Limited Quantities Packing


Instructions

Cargo Aircraft Limited Quantities

Max net Qty

Special Provisions Not applicable.

Emergency Response 2L

Guidebook (ERG) Code	
ADR Classification Code	2A
ADR HIN	20
ADR Transport Category	3
Tunnel Restriction Code	C/E
Emergency Action Code	2TE
Advice on Additional Personal Protection (APP)	Not applicable.
14.4 Packing group	
Packing group	Not applicable.
Labels	2.2
	
Special Provisions	274
Limited Quantities	120 m
Excepted Quantities	E1
Mixed Packing Instructions for Packages	P200
Special Packing Provisions for Packages	Not applicable.
Mixed Packing Instructions for Packages	MP9
14.5 Environmental hazards	
Environmental hazards	Not classified as a Marine Pollutant.
14.6 Special precautions for user	
Special precautions for user	Not known.
14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	
Packing Instructions for Portable Tanks (M) T50	
Special Provisions for Portable Tanks	Not applicable.
Tank Code for Tanks	PxBN(M)
Special Provisions for Tanks	TA4 TT9
Vehicle for Tank Carriage	AT
Special Provisions for Carriage	Not applicable.

**Packages**

Special Provisions for Carriage - Not applicable.

Bulk

Special Provisions for Carriage - CV9 CV10 CV36

Loading, Unloading and Handling

Special Provisions for Carriage - Not applicable.

Operation**15. SECTION 15: REGULATORY INFORMATION****15.1 Federal**

Toxic and hazardous substances All chemicals are not listed.

(29 CFR 1910; Subpart Z)

National emission standards for All chemicals are not listed.

hazardous air pollutants (40 CFR

61.01)

Title III Consolidated List of Lists All chemicals listed.

TSCA (Toxic Substance Control Act) All chemicals listed, except: Chlorotetrafluoroethane (CAS No. 63938-10-3).

SARA 313 Toxic Chemicals Chlorodifluoromethane (CAS No. 75-45-6).

CAA 602 - Ozone Depleting Substances (ODS) Chlorodifluoromethane (CAS No. 75-45-6) – Class II ODS.

15.2 State

State Right to Know Lists

Chlorodifluoromethane (CAS No. 75-45-6)

Listed in: New Jersey, Minnesota, Pennsylvania, Rhode Island



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Chlorotetrafluoroethane (CAS No. 63938-10-3)

Listed in: New Jersey

1,1-difluoroethane (CAS No. 75-37-6)

Listed in: New Jersey

Proposition 65 (California) All chemicals are not listed.

15.3 Other

OSPAR List of Chemicals for Priority Action All chemicals are not listed.

NTP (National Toxicology Program) All chemicals are not listed.

OSHA (List of Highly Hazardous Chemicals, Toxics and Reactives) All chemicals are not listed.

IARC (International Agency for Research on Cancer) Chlorodifluoromethane (CAS No. 75-45-6).

16. SECTION 16: OTHER INFORMATION

The following sections contain 1-16 revisions or new statements:

NFPA		HMIS	
Health	2	Health	1
Fire	1	Flammability	0
Instability	0	Physical hazards	1

LEGEND:

Hazard Pictogram(s)



GHS04

Hazard Statement(s)



GHS07

H280: Contains gas under pressure; may explode if heated.
 H420: Harms public health and the environment by destroying ozone in the upper atmosphere.
 EUH059: Hazardous to the ozone layer.

Precautionary Statement(s)

P410+P403: Protect from sunlight. Store in a well-ventilated place.
 P502: Refer to manufacturer for information on recovery/recycling.

Additional Information required by Federal Standard 313 Rev. E:

Contract or Solicitation Number: SPE4A6-16-D-0226
 Prime Contractor: Hudson Technologies, Inc.
 Prime Contractor CAGE: 7DSQ0

National Stock Number (NSN): 6830013913101

Specification Reference:

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