



TULSTAR PRODUCTS, INC.

5510 SOUTH LEWIS AVENUE • TULSA, OK 74105 • (918) 749-9060 • FAX (918) 747-1444
TULSTAR@TULSTAR.COM • WWW.TULSTAR.COM

MATERIAL SAFETY DATA SHEET

Company Information

Company Information: **TULSTAR PRODUCTS, INC.**
5510 S. Lewis Ave
Tulsa, OK 74105
Phone Number: (918) 749-9060
Fax Number: (918) 747-1444
Email Address: tulstar@tulstar.com
Emergency Phone Number: CHEMTREC 800-424-9300 (24 hours)

Product Information

Product Name: R401a
Other Generic names: Chlorodifluoromethane (HCFC-22)
Chlorotetrafluoroethane (HCFC-124)
Difluoroethane (HFC-152a)

Composition/Information on Ingredients

<u>Ingredient Name</u>	<u>CAS Number</u>	<u>Weight %</u>
Chlorodifluoroemethane (HCFC-22)	75-45-6	53
Chlorotetrafluoroethane (HCFC-124)	2837-89	34
Difluoroethane (HFC-152a)	75-37-6	13

Hazards Identification

Emergency Overview: Colorless, volatile liquid with ethereal and faint sweetish odor. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (> 250°C), decomposition products may include Hydrochloric Acid (HCl), Hydrofluoric Acid (HF), and carbonyl halides such as phosgene.

Potential Health Hazards:

- Skin- Irritation would result from defatting of tissue. Liquid contact may cause frostbite.
- Eyes- Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get medical attention.
- Inhalation- Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Call a physician. Do not give epinephrine (adrenaline).
- Ingestion- Ingestion is an unlikely route of exposure and is not expected to be hazardous. It may cause discomfort due to its low boiling point. Do not induce vomiting unless instructed to do so by a physician.
- Advice to Physician- Because of possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine, should be used with special caution only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

First Aid Measures

- Skin:** Promptly flush skin with water until all the chemical is removed. If there is evidence of frostbite, bath (do not rub) with lukewarm (not hot) water. In the absence of water, cover with a clean soft cloth or similar covering. Call a physician.
- Eye:** Immediately flush eyes with large amounts of water for at least 15 minutes, lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.
- Inhalation:** Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Call a physician. Do not give epinephrine (adrenaline).
- Ingestion:** Ingestion is unlikely because of the physical properties of the mixture, and is not expected to be hazardous. It may cause discomfort due to its low boiling point. Do not induce vomiting unless instructed to do so by a physician.
- Advice to Physician:** Because of possible disturbances of cardiac rhythm, catecholamine drugs such as epinephrine, should be used with special caution only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

Fire Fighting Measures

Flammable Properties:

Flash Point-	None
Autoignition Temperature-	Unknown
Upper Flame Limit (Volume % in air)-	None up to 80°C
Lower Flame Limit (Volume % in air)-	None up to 80°C
Flame Propagation Rate (Solids)-	Not Applicable
OSHA Flammability Class-	Not Applicable

Extinguishing Media: Use any standard agent – choose the one most appropriate for type of surrounding fire.

Unusual Fire & Explosion Hazards: The mixture is not flammable. One component (152a) does not have flame limits and a second (22) is combustible when mixed with air pressures above atmospheric. HCFC-124, by analogy, is expected to exhibit a similar characteristic to HCFC-22. It is, therefore, recommended that air not be mixed with 104a at pressures exceeding and that mixtures of air and 401a not be used for leakage detection.

Special Fire Fighting Precautions: Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against suffocation and possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decompositions.

Accidental Release Measures

In Case of Spill or Other Release: Always wear recommended personal protective equipment. Unprotected personnel should not return until air has been tested and determined safe, including underlying areas. Personnel using self-contained breathing apparatus, and other protective equipment, should try to eliminate any possible ignition source and close valves or repair source of leak.

Handling & Storage

Normal Handling: Always wear recommended personal protective equipment. Avoid breathing vapors or liquid contact with eyes, skin or clothing. Do not puncture or drop containers, expose them to flame or excessive heat or drilling. Tank cleaning personnel should use only a formal tank entry procedure based on recognized safety principles. It should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

Storage: Store in a cool, well-ventilated area of low fire risk. Protect container and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly and replace container guard after use and when empty.

Exposure Controls/Personal Protection

Engineering Controls: Provide local exhaust at filling zones and areas where leakage is probable. Mechanical ventilation may be adequate for other operating and storage areas.

Personal Protection Equipment:

- Skin Protection- Skin contact with refrigerant gases may cause frostbite. General work clothing and gloves (leather) should be provide adequate protection under routine conditions. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.
- Eye Protection- For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles. Contact lenses should not be worn under such conditions.
- Respiratory Protection- None generally required for adequately vented work situations. For accidental or non-ventilated situations, where concentration may rise above the PEL of 1,000 ppm, use a self-contained NIOSH approved breathing apparatus.
- Additional Recommendations- Impervious boots in case of spillage or leakage, or if there is the probability of repeated or prolonged contact with liquid product. High dose-level warning signs are recommended for areas of principal exposure. Provide eyewash stations and quick drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations.

Exposure Guidelines:

<u>Ingredient Name</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>Other Limit</u>
Chlorodifluoromethane (HCFC-22)	1000 ppm (TWA)	1000 ppm (TWA)	None
Chlorotetrafluoroethane (HCFC-124)	None established	None established	1000 ppm TWA
Difluoroethane (HFC-152a)	None	None	1000 ppm TWA

Physical & Chemical Properties

- Appearance: Liquefied gas
- Physical State: Gas at normal temperatures
- Molecular Weight: 94.4
- Chemical Formula: CHClF₂ (wt%) = 53
CH₃CHF₂ (wt%) = 13
CHClF₂CF₃ (wt%) = 34
- Odor: Slightly ethereal
- Specific Gravity: 1.188 @ 25° C (70°F) (Water = 1.0)
- Solubility in Water: 0.24 wt % @ 25°C (77°F) (Weight %)
- pH: Neutral
- Boiling Point: -33°C (-30.5°F) Average
- Melting Point: Unknown
- Vapor Pressure: 111.2 psia @ 25°C (77°F)
- Vapor Density: 3.5 (Air = 1.0)
- Evaporation Rate: Greater than 1 Compared to: CCl₄ = 1.0
- % Volatiles: % Volatiles by volume @ 68°F (20°C) = 100
- Flash Point: None detected; will not burn

Stability & Reactivity

- Normally Stable (Conditions to Avoid): The product is stable. Do not mix with oxygen or air above atmospheric pressure. Any source of high temperature, such as lighted cigarettes, flames, hot sports, welding, may yield toxic or corrosive decomposition products.
- Incompatibilities: Freshly abraded aluminum surfaces may cause strong exothermic reaction. Chemically active metals- sodium, potassium, calcium, powdered magnesium, and zinc.
- Hazardous Decomposition Products: Halogens, halogen acids, and possible carbonyl halides, such as phosgene. These are toxic and corrosive.
- Hazardous Polymerization: Will not occur.

Toxicological Information

Immediate (acute) effects: LC₅₀ 4HR (rat)- ≥ 230,000 ppm (based on HCFC-22)
Cardiac Sensitization Threshold (dog)- ≥ 25,000 ppm (based on HCFC-124)
EC₅₀ (rat)- ≥ 25,000 ppm (based on HCFC-124)
Delayed (Subchronic & Chronic) Effects: Chronic Inhalation NOEL (rat)- ≥ 25,000 ppm (based on HFC-152a)
Other Data: None of the components have positive genetic test results.

Ecological Information

Degardability/Aquatic Toxicity: Not pertinent.

Disposal Considerations

RCRA: Is the unused product a RCRA hazardous waste if discarded? Not a "hazardous waste" if discarded.

If yes, the RCRA ID number is- Not applicable

Other Disposal Considerations: Disposer must comply with federal, state and local disposal or discharge laws. Disposal of 401a may be subject to state and local regulations. User should review their operations in terms of applicable state and local laws and regulations, then consult with appropriate regulatory agencies before discharging or disposing of waste material.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

Transport Information

US DOT Hazard Class: US DOT proper shipping name- Liquefied gas (chlorodifluoromethane, chlorotetrafluoroethane, difluoroethane)

US DOT Hazard Class- 2.2

US DOT Packing Group- Not applicable

US DOT ID Number: UN3163