

MATERIAL SAFETY DATA SHEET

MANUFACTURER: Duracool Limited

ADDRESS: 10260 - 21 Street NW
Edmonton, Alberta, Canada T6P 1W4

PHONE: (780) 449-4777

FAX: (780) 449-4766

CHEMTREC

Toll Free 24-Hour Emergency
Telephone Number

North America: 1-800-424-9300

International: (730) 527-3887
call collect

IDENTIFICATION

PRODUCT NAME: Duracool 12a®
Duracool 22a®
Duracool 502a®

UN NUMBER: UN1075

DANGEROUS GOODS CLASS: 2

USES: Refrigerant

DIVISION: 2.1

WHMIS CLASSIFICATION: Class A
Class B, Division 1

PHYSICAL PROPERTIES

DURACOOOL 12a®

PHYSICAL STATE: Gas

SPECIFIC GRAVITY: 0.552

EVAPORATION RATE: Fast >1 (1=n-butylacetate)

FREEZING POINT: n. av.

pH: n. ap.

ODOUR & APPEARANCE: Colourless gas, faintly disagreeable odour, stench to allow detection of leaks

ODOUR THRESHOLD: 4900 ppm

VAPOUR PRESSURE (kPa @ 21°C): 482

(psig @ 70°F): 70

VAPOUR DENSITY: 1.72

BOILING POINT: -31.5°C -24.7°F

COEFFICIENT OF WATER/OIL DISTRIBUTION: <1

DURACOOOL 22a®

PHYSICAL STATE: Gas

SPECIFIC GRAVITY: 0.529

EVAPORATION RATE: Fast >1 (1=n-butylacetate)

FREEZING POINT: -188°C -306°F

pH: n. ap.

ODOUR & APPEARANCE: Colourless gas, faintly disagreeable odour, stench to allow detection of leaks

ODOUR THRESHOLD: 4800 ppm

VAPOUR PRESSURE (kPa @ 21°C): 758

(psig @ 70°F): 110

VAPOUR DENSITY: 1.52

BOILING POINT: -42.1°C -43.8°F

COEFFICIENT OF WATER/OIL DISTRIBUTION: <1

DURACOOOL 502a®

PHYSICAL STATE: Gas

SPECIFIC GRAVITY: 0.506

EVAPORATION RATE: Fast >1 (1=n-butylacetate)

FREEZING POINT: -187.7°C -306°F

pH: n. ap.

ODOUR & APPEARANCE: Colourless gas, faintly disagreeable odour, stench to allow detection of leaks

ODOUR THRESHOLD: 4800 ppm

VAPOUR PRESSURE (kPa @ 21°C): 965

(psig @ 70°F): 140

VAPOUR DENSITY: 1.50

BOILING POINT: -49°C -56.2°F

COEFFICIENT OF WATER/OIL DISTRIBUTION: <1

INGREDIENTS**DURACOOOL 12a®**

ACGIH(1998)

COMPONENTS	% v/v	CAS	LD50	LC50 inhalation	TLV-TWA (ppm)
methylethylmethane	15-40	106-97-8	n.ap.	(mouse) 680mg/½hr	800
2-methylpropane	30-60	75-28-5	n.ap.	(mouse) 52mg/kg 1hr	800
dimethylmethane	40-70	74-98-6	n.ap.	n.av.	2500
Non Hazardous Ingredients	=<2	n.ap.	n.ap.	n.ap.	n.ap.

DURACOOOL 22a®

ACGIH(1998)

COMPONENTS	% v/v	CAS	LD50	LC50	TLV-TWA (ppm)
dimethylmethane	=>98	74-98-6	n.ap.	n.av.	2500
Non Hazardous Ingredients	=<2	n.ap.	n.ap.	n.ap.	n.ap.

DURACOOOL 502a®

ACGIH(1998)

COMPONENTS	% v/v	CAS	LD50	LC50	TLV-TWA (ppm)
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ethyl hydride	3-7	78-84-0	n.ap.	n.av.	simple asphyxiant
dimethylmethane	60-100	74-98-6	n.ap.	n.av.	2500
Non Hazardous Ingredients	=<2	n.ap.	n.ap.	n.ap.	n.ap.

TOXICOLOGICAL ASSESSMENT

INGESTION: Not likely to occur.

SKIN OR EYE CONTACT: Exposure to rapidly expanding gas or vapourizing liquid may cause frost damage to tissue and permanent eye damage. Prolonged contact may irritate the skin and cause dermatitis.

INHALATION: The gas mixture can act as an asphyxiant decreasing the available oxygen concentration of the air. Moderate concentrations may cause headache, drowsiness, dizziness, nausea, vomiting and unconsciousness. High concentrations of vapour may have some degree of anaesthetic action and can be mildly irritating to the mucous membranes. Vapours may be encountered in confined spaces and/or under conditions of poor ventilation. Avoid breathing vapours or mist.

CHRONIC: 12a® Prolonged and/or repeated exposures may cause dermatitis.

22a® No harm expected.

502a® Prolonged and/or repeated exposures may cause dermatitis.

CARCINOGENICITY,
REPRODUCTIVE TOXICITY,
TERATOGENICITY AND
EMBRYOTOXICITY,

MUTAGENICITY: No effects reported, not listed by NTP, OSHA or LARC.

SYNERGISTIC: May aggravate an existing dermatitis. The above evaluation of hazard is based on knowledge of the toxicity of the material's components.

EXPOSURE LIMITS: 12a ® ACGIH recommends:
800 ppm (1900 mg/m3)
OSHA PEL: 800 ppm

22a®, 502a® ACGIH recommends:
2500 ppm
OSHA PEL: 1000 ppm

FIRST AID MEASURES

EYES: Check for contact lenses and remove if present. Flush eyes with large amounts of water for at least 15 minutes. Call for medical attention if irritation persists.

INHALATION: In emergency situations use proper respiratory protection and immediately remove the victim from exposure. Administer artificial respiration if breathing has stopped. Keep at rest and call for medical attention.

SKIN: Flush with large amounts of water. Use soap if available. Remove severely contaminated clothing (including shoes) and launder before reuse. In case of frostbite from contact with liquid, immediately place affected area in lukewarm water and keep at this temperature until circulation returns. If inflammation or irritation develop seek immediate medical attention

INGESTION: Not likely to occur.

PREVENTIVE MEASURES

PERSONAL PROTECTION: The selection of personal protective equipment varies, depending upon conditions of use. In open systems where contact is likely, wear gas-proof goggles, face shield, chemical-resistant overalls and appropriate thermal/chemical gloves. Where skin and eye contact is unlikely, but may occur as a result of short and/or periodic exposures, wear long sleeves, chemical resistant gloves and gas-proof goggles. Where concentrations in air may exceed the occupational exposure limits and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent overexposure by inhalation. Respiratory protection must be NIOSH/MSHA approved and conform to OSHA rules specified in 29 CFR 1910.134.

ENGINEERING Use only in well ventilated situations or employ

CONTROLS: extraction ventilation to maintain atmospheric concentrations well below exposure standards. All mechanical equipment used in ventilation systems should be spark proof.

SPILL/DISPOSAL PROCEDURES: Eliminate all sources of ignition. Prevent additional discharge of material if possible to do so without hazard. Warn occupants of downwind areas. Disperse vapours with hose streams using fog nozzles. Ensure disposal is in compliance with government requirements and ensure conformity to local disposal regulations. Notify the appropriate authorities immediately.

HANDLING, STORAGE & SHIPPING: Store in a cool, well ventilated place away from incompatible materials, do not allow cylinder temperature to exceed 52°C (125°F). Cylinders that are not in use must have the valves in the closed position and be equipped with a protective cap. Transport and store cylinders secured in an upright position in a ventilated space. Use proper grounding procedures.

DOT / TDG: Petroleum gases, liquefied, 2.1, UN1075

FIRE OR EXPLOSION HAZARD

DURACOOOL 12a®

FLAMMABILITY LIMITS IN AIR LEL	UEL
(% BY VOLUME): 1.95%	9.1%
AUTOIGNITION TEMPERATURE: 891°C 1636°F	
FLASHPOINT: n. av.	

DURACOOOL 22a®

FLAMMABILITY LIMITS IN AIR LEL	UEL
(% BY VOLUME): 2.0%	10.0%
AUTOIGNITION TEMPERATURE: 468°C 875°F	
FLASHPOINT: n. av.	

DURACOOOL 502a®

FLAMMABILITY LIMITS IN AIR LEL	UEL
(% BY VOLUME): 2.2%	10.2%
AUTOIGNITION TEMPERATURE: 434°C 813°F	
FLASHPOINT: n. av.	

HAZARDOUS COMBUSTION PRODUCTS: Carbon monoxide, carbon dioxide.

SENSITIVITY TO MECHANICAL IMPACT: Mixture not sensitive, protect cylinders from damage.

SENSITIVITY TO STATIC DISCHARGE: Vapours may ignite if exposed to static discharge.

FIRE AND EXPLOSION HAZARD: Flammable air-vapour mixtures may form if allowed to leak to atmosphere. Accumulation of gas is an ignition hazard. Vapours are heavier than air and may travel to an ignition source.

FIRE EXTINGUISHING PRECAUTIONS: Use water spray to cool exposed cylinders. Do not extinguish flames unless leak can be stopped. Fire can be extinguished with carbon dioxide and/or dry chemical.

REACTIVITY DATA

This material is stable. Hazardous Polymerization will not occur.

INCOMPATIBILITY: Nickel carbonyl with oxygen, chlorine, strong oxidizers.

CONDITIONS TO AVOID: Avoid excessive heat and/or static discharge. Gas explodes spontaneously when mixed with chlorine dioxide.

HAZARDOUS DECOMPOSITION: Thermal decomposition and burning may produce carbon monoxide and/or carbon dioxide.

PREPARATION

Duracool Limited, Technical Department.
(780) 449-4777 November 26, 1999

All information given by Duracool Limited is offered in good faith and is believed to the best of our knowledge to be accurate. The information contained herein is based on supplier and/or other information available at the indicated date of preparation. Duracool does not guarantee the accuracy and this information is offered without warranty, guarantee or liability on the part of the preparer in good faith.

n. av. not available

n. ap. not applicable

est. estimate

v/v volume/volume basis

< less than

> greater than