BOC Limited
ABN 95 000 029 729
10 Julius Avenue
NORTH RYDE NSW 2113
Tel + 61 131 262
Fax + 61 132 427

MATERIAL SAFETY DATA SHEET
052

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name **R410A (BOC LIMITED)**

Synonyms 168 - BOC PRODUCT CODE.

Uses REFRIGERANT.

Supplier Name BOC LIMITED (AUSTRALIA)
Address 10 Julius Avenue, North Ryde NSW, 2113, AUSTRALIA
Telephone + 61 131 262, (02) 8874 4400
Fax + 61 132 427 (24 hours)
Emergency 1800 653 572 (A/H) (Australia only)

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO NOHSC CRITERIA
CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Formula	Conc.	CAS No.
DIFLUOROMETHANE (HFC-32)	C-H2-F2	50%	75-10-5
PENTAFLUOROETHANE (HFC-125)	C2-H-F5	50%	354-33-6

4. FIRST AID MEASURES

Eye Hold eyelids apart and flush continuously with water or sterile saline solution. Continue until advised to stop by the Poisons Information Centre or for at least 15 minutes.

Inhalation Leave area of exposure immediately. If assisting a victim avoid becoming a casualty, wear an Air-line respirator or Self Contained Breathing Apparatus (SCBA). If victim is not breathing apply artificial respiration and seek urgent medical attention. Give oxygen if available.

Skin COLD BURNS: Remove contaminated clothing and gently flush affected areas with warm water (30 C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention.

Ingestion For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor. If swallowed, do not induce vomiting. Ingestion is considered unlikely due to product form.

Advice To Doctor Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve toxic gases (eg. fluorides, carbon oxides, hydrogen fluoride) when heated to decomposition.

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5. FIRE FIGHTING MEASURES cont.

Fire and Explosion

Non flammable gas. Evacuate area in fire situation and contact emergency services. Do not approach cylinders. Use waterfog to cool intact containers and nearby storage areas.

Extinguishing Non flammable. Use water fog to cool intact containers.

Hazchem Code 2RE

6. ACCIDENTAL RELEASE MEASURES

Spillage GAS CYLINDERS: If the cylinder is leaking, wearing appropriate PPE move it to a well ventilated area and allow to discharge. Eliminate all potential ignition sources. Inform supplier of leak. Do not attempt to repair leaking valve. Clear area of personnel in direction of gas movement.

7. HANDLING AND STORAGE

Handling Use safe work practices to avoid eye or skin contact and inhalation. Observe good personal hygiene. Prohibit eating, drinking and smoking in contaminated areas. Wash hands before eating. Remove contaminated clothing and protective equipment before entering eating areas.

Method of Application This product is transferred as a liquid in and out of refrigeration equipment by controlled pressure decanting through flexible pipework.

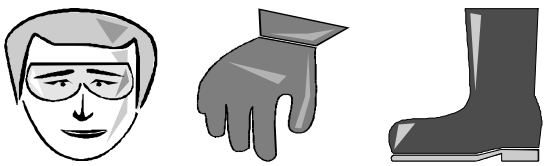
Storage Store cylinders securely, in separate area in an upright position in cool (<45 C), dry, well ventilated area, removed from heat sources, oxidising agents, alkalis, alkaline earth metals, metal powders & foodstuffs. Ensure cylinders are labelled, protected from physical damage and valves closed when not in use. Make use of old stock first, do not store empty and full cylinders together. Also store removed from freshly abraded aluminium.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation Use with adequate natural ventilation. Open windows and doors where possible. In poorly ventilated areas, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

Exposure Standards An exposure standard (ES-TWA, ES-STEL, WES) has not been allocated to the ingredients contained in this product.

PPE Wear safety glasses, safety boots and nitrile gloves. When using large quantities or where heavy contamination is likely, wear coveralls. Where an inhalation risk exists, wear an Air-line respirator.



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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: COLOURLESS LIQUID
Odour: FAINT SWEET AND ETHEREAL ODOUR
pH: NOT AVAILABLE
Vapour Pressure: 1484 kPa @ 21 C
Vapour Density: 3.0 (Air = 1)
Boiling Point: - 52.8 C
Melting Point: NOT AVAILABLE
Evaporation Rate: NOT AVAILABLE
Solubility (water): 0.28 % @ 25 C
Specific Gravity: NOT AVAILABLE
% Volatiles: 99.99 %
Flammability: NON FLAMMABLE
Flash Point: NOT RELEVANT
Upper Explosion Limit: NOT RELEVANT
Lower Explosion Limit: NOT RELEVANT
Autoignition Temperature: NOT AVAILABLE

10. STABILITY AND REACTIVITY

Reactivity Incompatible with oxidising agents (eg. hypochlorite), alkalis/ alkali earth metals and finely divided metal powders (eg. aluminium, barium, lithium). Also incompatible with freshly abraded aluminium surfaces and may cause a strong exothermic reaction.

Decomposition Products fluorides, carbon oxides, hydrogen fluoride) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Asphyxiant gas - non irritant. Adverse health effects may result upon exposure at very high levels or with direct contact. Prevent vapour build up and direct eye/skin contact. Over exposure at high levels may result in cardiac arrhythmias (irregular beating or arrest of the heart). Individuals with pre-existing medical conditions (CNS, heart, lungs, kidneys) may have increased susceptibility.

Eye Non irritating. However, direct contact with liquid may result in corneal burns and severe frost-bite with possible permanent damage.

Inhalation Non irritant - Asphyxiant. Effects are proportional to oxygen displacement with symptoms that include air hunger, rapid breathing, elevated heart rate, drowsiness and loss of mental alertness. At high levels, lack of coordination, vomiting, mental instability, shaking, lung damage, convulsions, coma and death.

Skin Non irritating. Contact with liquid (eg. cold vessels or pipes containing liquid or vapour) may result in frost-bite with severe tissue damage.

Ingestion Due to product form (gas), ingestion is considered highly unlikely.

Toxicity Data

DIFLUOROMETHANE (HFC-32) (75-10-5)
LC50 (Inhalation) : 1810 g/m3 (mouse)

PENTAFLUOROETHANE (HFC-125) (354-33-6)
LC50 (Inhalation) : 2735 g/m3/2 hours (mouse)

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12. ECOLOGICAL INFORMATION

Environment Global warming has been predicted as a potential consequence of the emission of this product.

13. DISPOSAL CONSIDERATIONS

Waste Disposal If stored in cylinders, return to manufacturer or supplier for recycling. Do not puncture or incinerate. Dispose of to an approved landfill site. Contact the manufacturer for additional information.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Transport Class 2.2 Non flammable gas. Do not transport with chemicals of class; 1 (Explosives), 4.2 (Spontaneously combustibles), 5.2 (Organic peroxides) and foodstuffs.

UN Number	1078
Shipping Name	REFRIGERANT GAS, N.O.S.
DG Class	2.2
Subsidiary Risk(s)	None Allocated
Packing Group	None Allocated
Hazchem Code	2RE

15. REGULATORY INFORMATION

Poison Schedule A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

16. OTHER INFORMATION

Additional Information ASPHYXIANT GASES: Asphyxiant gases may displace oxygen, leading to oxygen deficiency. Where oxygen content is low, effects may include: 12-16% oxygen: increased breathing/ pulse rate, lack of coordination; 10-14%: mental disturbance, fatigue, breathing stress; 6-10%: vomiting, collapse and possible unconsciousness; 0-6%: convulsions, respiratory collapse and death.

ASPHYXIANTS (1): When present in the atmospheres in high concentrations, asphyxiants reduce the oxygen concentration by displacement. Atmospheres deficient in oxygen do not provide adequate sensory warning of danger and most simple asphyxiants are odourless. Therefore it is not appropriate to recommend an exposure standard for each asphyxiant, but to maintain oxygen concentrations. However, some asphyxiants may be given an exposure standard due to the potential for narcotic effects at high concentrations or an explosion hazard.

ASPHYXIANTS (2): There is a significant hazard associated with workers entering poorly ventilated areas (eg. tanks) where oxygen may be deficient. An air supplied breathing apparatus may be required if adequate ventilation is not ensured. Refer to AS/NZS 2865 - Safe Working in a Confined Space.

COLOUR RATING SYSTEM: Chem Alert reports are assigned a colour rating of Green, Amber or Red for the purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe

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16. OTHER INFORMATION cont.

handling recommendations are provided in all Chem Alert reports so as to clearly identify how users can control the hazards and thereby reduce the risk (or likelihood) of adverse effects. As a general guideline a Green colour rating indicates a low hazard, an Amber colour rating indicates a moderate hazard and a Red colour rating indicates a high hazard.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this Chem Alert report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made. Information provided by Risk Management Technologies is summarised for ease of use. Additional technical information is available by calling +61 8 9322 1711.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a Chem Alert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

ABBREVIATIONS:
mg/m3 - Milligrams per cubic metre
ppm - Parts Per Million
TWA/ES - Time Weighted Average or Exposure Standard.
pH - relates to hydrogen ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline.
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
M - moles per litre, a unit of concentration.
IARC - International Agency for Research on Cancer.

Report Reviewed 16th November 2004

Date Printed 16th December 2004

Report Status Chem Alert reports are compiled as an independent source of information by RMT's scientific department, based on the latest chemical and toxicological research and, where appropriate, in compliance with relevant standards, guidance notes and legislation. Where available the manufacturer's original MSDS is also provided to Chem Alert subscribers as a scanned image for their convenience. In many instances Chem Alert reports are compiled on behalf of manufacturers in which case they serve as the "Manufacturer's MSDS" and are clearly identifed as such on the relevant reports.

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Colour Rating AMBER