BOC Limited
ABN 95 000 029 729

MATERIAL SAFETY DATA SHEET

 # 008

PRODUCT NAME **R407C**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name	**BOC LIMITED (AUSTRALIA)**
Address	10 Julius Avenue, North Ryde, NSW, AUSTRALIA, 2113
Telephone	+61 131 262, (02) 8874 4400
Fax	+61 132 427 (24 hours)
Emergency	1800 653 572 (24/7) (Australia only)
Web Site	http://www.boc.com.au/
Synonym(s)	GENETRON 407C • PRODUCT CODE: 224 • 008 - MSDS NUMBER
Use(s)	REFRIGERANT
MSDS Date	19 June 2008

2. HAZARDS IDENTIFICATION

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO NOHSC CRITERIA

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

UN No.	3340	**DG Class**	2.2	**Subsidiary Risk(s)**	None Allocated
Pkg Group	None Allocated	**Hazchem Code**	2RE	**EPG**	2C2

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content w/w
1,1,1,2-TETRAFLUOROETHANE (HFC 134A)	C2-H2-F4	811-97-2	52%
PENTAFLUOROETHANE (HFC-125)	C2-H-F5	354-33-6	25%
DIFLUOROMETHANE (HFC-32)	C-H2-F2	75-10-5	23%

4. FIRST AID MEASURES

Eye	Treatment for cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention.
Inhalation	If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if available. Keep warm and rested. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor
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	Ingestion is considered unlikely due to product form.
Advice to Doctor	Use of adrenaline and other catecholamines may be contraindicated due to possible cardiac sensitisation. Treatment for asphyxia.

5. FIRE FIGHTING MEASURES

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

Fire and Explosion Temperatures in a fire may cause cylinders to rupture. Cool cylinders exposed to fire by applying water from a protected location. Do not approach cylinders suspected of being hot.

Extinguishing Use water fog to cool containers from protected area.

Hazchem Code 2RE

6. ACCIDENTAL RELEASE MEASURES

Spillage Always ensure cylinder pressure is below equipment pressure rating and any relief valve setting. Contact manufacturer for guidance. Leak checking may be done by pressure drop test or by using soapy water on outlets and outlets. Shut cylinder valve to stop gas leaks from equipment if possible and safe to do so. If cylinder or cylinder valve is leaking then shut the cylinder valve, depressurise the equipment, disconnect cylinder from equipment and move the cylinder to a well ventilated area, preferably outdoors. Never attempt to repair a leaking or damaged cylinder valve.

7. STORAGE AND HANDLING

Storage Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
		ppm	mg/m3	ppm	mg/m3
1,1,1,2-Tetrafluoroethane	NOHSC (AUS)	1000.0	4240.0	--	--

PENTAFLUOROETHANE (HFC-125)

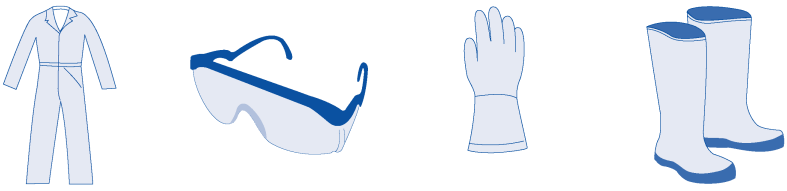
ES-TWA: Asphyxiant

WES-TWA: Asphyxiant

Biological Limits No biological limit allocated.

Engineering Controls Use with adequate ventilation. In poorly ventilated areas, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

PPE Wear safety boots, leather gloves, coveralls and safety glasses. Where a significant inhalation risk exists, wear an Air-line respirator.



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS LIQUEFIED GAS	**Solubility (water)**	0.0015 g/g
Odour	SLIGHT SWEET/ETHEREAL ODOUR	**Specific Gravity**	1.17 @ 20°C (Liquid)
pH	NOT APPLICABLE	**% Volatiles**	100 %
Vapour Pressure	1190 kPa @ 21°C	**Flammability**	NON FLAMMABLE
Vapour Density	3.6 (Air = 1)	**Flash Point**	NOT APPLICABLE
Boiling Point	-43°C	**Upper Explosion Limit**	NOT APPLICABLE
Melting Point	NOT AVAILABLE	**Lower Explosion Limit**	NOT APPLICABLE
Evaporation Rate	NOT APPLICABLE	**Autoignition Temperature**	NOT AVAILABLE

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

Conditions to Avoid Avoid heat, sparks, open flames and other ignition sources.

Material to Avoid Incompatible with oxidising agents (eg. hypochlorite), alkalis/ alkali earth metals. Compounding ingredients in natural rubber can be extracted during rapid liquid withdrawal causing the rubber to swell.

Decomposition May evolve toxic gases (eg: fluorides, carbon oxides, hydrogen fluoride) when heated to decomposition.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Asphyxiant. Symptoms of exposure are directly related to displacement of oxygen from air. As the amount of oxygen inhaled is reduced from 21-14% volume, the pulse rate will accelerate and the rate and volume of breathing will increase. The ability to maintain attention and think clearly is diminished, muscular co-ordination is somewhat disturbed. As oxygen decreases from 14-10% volume, judgement becomes faulty, severe injuries may cause no pain. Muscular effort lead to rapid fatigue. Further reduction to 6% may cause nausea and vomiting. Ability to move may be lost. Permanent brain damage may result even after resuscitation from exposure to this low level of oxygen. Below 6% breathing is in gasps and convulsions may occur. Inhalation of a mixture containing no oxygen may result in unconsciousness from the first breath and death will follow in minutes.

Eye Irritant vapour. Low temperature evaporating liquid can cause cold burns.

Inhalation Irritant - asphyxiant. Effects are proportional to oxygen displacement.

Skin Irritating vapour. Low temperature evaporating liquid can cause cold burns.

Ingestion Ingestion is considered unlikely due to product form.

Toxicity Data

1,1,1,2-TETRAFLUOROETHANE (HFC 134A) (811-97-2)
LC50 (Inhalation): 1500 g/m3/4 hour (rat)
PENTAFLUOROETHANE (HFC-125) (354-33-6)
LC50 (Inhalation): 2735 g/m3/2 hours (mouse)
DIFLUOROMETHANE (HFC-32) (75-10-5)
LC50 (Inhalation): 1810 g/m3 (mouse)

12. ECOLOGICAL INFORMATION

Environment Product is not ozone deleting. Non-bioaccumulative. Product is persistent in the atmosphere. Not hazardous to aquatic environment. Very low toxicity for aquatic organisms.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Recover and recycle using appropriate techniques and equipment. Return all recovered material to the supplier for recycle or disposal.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Transport Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE

Shipping Name	REFRIGERANT GAS R407C				
UN No.	3340	**DG Class**	2.2	**Subsidiary Risk(s)**	None Allocated
Pkg Group	None Allocated	**Hazchem Code**	2RE	**EPG**	2C2

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).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

16. OTHER INFORMATION

Additional Information APPLICATION METHOD: Transferred as a liquid into and out of refrigeration equipment by controlled pressure decanting through flexible pipework.

ABBREVIATIONS:
ADB - Air-Dry Basis.
BEI - Biological Exposure Indice(s)
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EINECS - European INventory of Existing Commercial chemical Substances.
IARC - International Agency for Research on Cancer.
M - moles per litre, a unit of concentration.
mg/m3 - Milligrams per cubic metre.
NOS - Not Otherwise Specified.
NTP - National Toxicology Program.
OSHA - Occupational Safety and Health Administration.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
TWA/ES - Time Weighted Average or Exposure Standard.

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.

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.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Material Safety Data Sheet ('MSDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer.

While RMT has taken all due care to include accurate and up-to-date information in this MSDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this MSDS.

Prepared By
Risk Management Technologies
5 Ventnor Ave, West Perth
Western Australia 6005
Phone: +61 8 9322 1711
Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au

MSDS Date: 19 June 2008

End of Report