1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier
Product name: PHOSGENE
Synonym(s): 084 - MSDS NUMBER • CARBONYL CHLORIDE • PRODUCT CODES: 160, 175

1.2 Uses and uses advised against
Use(s): CHEMICAL REAGENT

1.3 Details of the supplier of the product
Supplier name: BOC LIMITED (AUSTRALIA)
Address: 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA
Telephone: 131 262, (02) 8874 4400
Fax: 132 427 (24 hours)
Website: http://www.boc.com.au

1.4 Emergency telephone number(s)
Emergency: 1800 653 572 (24/7) (Australia only)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
CLASSIFIED AS HAZARDOUS ACCORDING TO AUSTRALIAN WHS REGULATIONS

GHS classification(s)
- Acute Toxicity: Inhalation: Category 2
- Gases Under Pressure: Liquefied gas
- Skin Corrosion/Irritation: Category 1B

2.2 Label elements
Signal word: DANGER

Pictogram(s)

Hazard statement(s)
- H280: Contains gas under pressure; may explode if heated.
- H314: Causes severe skin burns and eye damage.
- H330: Fatal if inhaled.

Prevention statement(s)
- P260: Do not breathe dust/fume/gas/mist/vapours/spray.
- P264: Wash thoroughly after handling.
- P271: Use only outdoors or in a well-ventilated area.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P284: Wear respiratory protection.
Response statement(s)
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P320 Specific treatment is urgent - see first aid instructions.
P363 Wash contaminated clothing before reuse.

Storage statement(s)
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s)
P501 Dispose of contents/container in accordance with relevant regulations.

2.3 Other hazards
Asphyxiant. Effects are proportional to oxygen displacement.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>EC Number</th>
<th>Content (v/v)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHOSGENE</td>
<td>75-44-5</td>
<td>200-870-3</td>
<td>&gt;99%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye
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). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison 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
Due to product form and application, ingestion is considered unlikely.

First aid facilities
Eye wash facilities should be available.

4.2 Most important symptoms and effects, both acute and delayed

Exposure may produce catching of breath, choking, coughing, tightness in chest, lacrimation, difficulty and pain in breathing and cyanosis. Brief exposure to 50 ppm may be rapidly fatal. Late developing symptoms are oedema, coughing with bloody sputum and general weakness.

4.3 Immediate medical attention and special treatment needed

The manufacturer reports that patients should be kept rested and under observation for 24 - 48 hours in case of pulmonary odema. Subsequent treatment is symptomatic and supportive. Continuous administration of oxygen be means of mask may be necessary for several days.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Use water fog to cool containers from protected area.

5.2 Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases (chlorides) when heated to decomposition. May evolve flammable hydrogen gas in contact with some metals. Cylinders may explode if heated.
5.3 Advice for firefighters
Temperatures in a fire may cause cylinders to rupture. Cool cylinders or containers exposed to fire by applying water from a protected location. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool. Do not approach cylinders or containers suspected of being hot.

5.4 Hazchem code
2XE
X Wear liquid-tight chemical protective clothing and breathing apparatus. Contain spill and run-off.
E Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS.

6.2 Environmental precautions
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

6.3 Methods of cleaning up
Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

6.4 Reference to other sections
See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement.

7.2 Conditions for safe storage, including any incompatibilities
Do not store near 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.

7.3 Specific end use(s)
No information provided.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters
Exposure standards

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Reference</th>
<th>TWA</th>
<th>STEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ppm</td>
<td>mg/m³</td>
</tr>
<tr>
<td>Phosgene</td>
<td>SWA (AUS)</td>
<td>0.02</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Biological limits
No biological limit values have been entered for this product.

8.2 Exposure controls
Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.
**PHOSGENE**

**PPE**
- **Eye / Face**: Wear safety glasses.
- **Hands**: Wear leather or insulated gloves.
- **Body**: Wear coveralls and safety boots.
- **Respiratory**: Wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>COLOURLESS GAS</td>
</tr>
<tr>
<td>Odour</td>
<td>MUSTY HAY ODOUR</td>
</tr>
<tr>
<td>Flammability</td>
<td>NON FLAMMABLE</td>
</tr>
<tr>
<td>Flash point</td>
<td>NOT RELEVANT</td>
</tr>
<tr>
<td>Boiling point</td>
<td>7.6°C</td>
</tr>
<tr>
<td>Melting point</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>NOT APPLICABLE</td>
</tr>
<tr>
<td>pH</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Vapour density</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>NOT APPLICABLE</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>DECOMPOSES</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>175 kPa @ 25°C</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>NOT RELEVANT</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>NOT RELEVANT</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Viscosity</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>NOT AVAILABLE</td>
</tr>
</tbody>
</table>

#### 9.2 Other information

- **Critical temperature**: 182°C
- **Critical pressure**: 5674 kPa
- **% Volatiles**: 100%

### 10. STABILITY AND REACTIVITY

#### 10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

#### 10.2 Chemical stability

No information provided.

#### 10.3 Possibility of hazardous reactions

Polymerization will not occur.

#### 10.4 Conditions to avoid

No information provided.

#### 10.5 Incompatible materials

Incompatible with water or moisture (evolving carbon dioxide and corrosive hydrochloric acid), amines, oxidising agents and alkalis (e.g. sodium hydroxide). Hydrochloric acid may evolve highly flammable hydrogen gas in contact with metals.

#### 10.6 Hazardous decomposition products

May evolve toxic gases (chlorides) when heated to decomposition.
11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity  Fatal if inhaled. Exposure may result in shortness of breath, choking, coughing, tightness in chest, lacrimation, difficulty and pain in breathing and cyanosis. Late developing symptoms are pulmonary oedema, coughing with bloody sputum and general weakness.

PHOSGENE
LC50 (Inhalation): 5 ppm / 1 hour (rat)

Skin  Causes burns. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.

Eye  Causes burns. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.

Sensitization  Not classified as causing skin or respiratory sensitisation.

Mutagenicity  Not classified as a mutagen.

Carcinogenicity  Not classified as a carcinogen.

Reproductive  Not classified as a reproductive toxin.

STOT – single exposure  Over exposure may result in damage to the respiratory system. Symptoms include sore throat, burning sensation, shortness of breath and oedema.

STOT – repeated exposure  Not classified as causing organ effects from repeated exposure.

Aspiration  Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No information provided.

12.2 Persistence and degradability
No information provided.

12.3 Bioaccumulative potential
No information provided.

12.4 Mobility in soil
No information provided.

12.5 Other adverse effects
No information provided.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Waste disposal  Cylinders should be returned to the manufacturer or supplier for disposal of contents.

Legislation  Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE
14.4 Packing Group | None Allocated | None Allocated | None Allocated

14.5 Environmental hazards | No information provided

14.6 Special precautions for user

<table>
<thead>
<tr>
<th>Hazchem code</th>
<th>2XE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTEPG</td>
<td>2B8</td>
</tr>
<tr>
<td>EMS</td>
<td>F-C, S-U</td>
</tr>
</tbody>
</table>

Other information: Ensure cylinder is separated from driver and foodstuffs. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

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

Classifications: Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes: C Corrosive, T+ Very toxic

Risk phrases: R26 Very toxic by inhalation, R34 Causes burns.

Safety phrases: S7/9 Keep container tightly closed and in a well ventilated place, S24/25 Avoid contact with skin and eyes, S45 In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

Inventory listing(s): AUSTRALIA: AICS (Australian Inventory of Chemical Substances)
All components are listed on AICS, or are exempt.

16. OTHER INFORMATION

Additional information: The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

APPLICATION METHOD: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this 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.

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 ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.
Report status

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ("SDS").

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier 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, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, 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 SDS.

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[ End of SDS ]