1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier
Product name: BERYLLIUM OXIDE
Synonym(s): DMO BERYLLIUM OXIDE

1.2 Uses and uses advised against
Use(s): HEAT SINK COMPOUND

1.3 Details of the supplier of the safety data sheet
Supplier name: DEFENCE MATERIEL ORGANISATION
Address: Russell Offices, ACT, Australia, 2600
Telephone: (02) 6266 7054 (Mon-Fri 0800-1700)
Fax: (02) 6266 7646
Email: dmo.hazchem@defence.gov.au
Website: Not supplied

1.4 Emergency telephone number(s)
Emergency: 13 11 26 (24Hrs)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA
GHS Classification(s):
- Acute Toxicity: Oral: Category 3
- Skin Corrosion/Irritation: Category 2
- Skin Sensitization: Category 1
- Serious Eye Damage / Eye Irritation: Category 2A
- Acute Toxicity: Inhalation: Category 2
- Specific Target Organ Systemic Toxicity (Single Exposure): Category 3
- Carcinogenicity: Category 1B
- Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 1

2.2 Label elements
Signal word: DANGER
Pictograms:

Hazard statement(s)
H301: Toxic if swallowed.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H330: Fatal if inhaled.
H335: May cause respiratory irritation.
H350: May cause cancer.
H372: Causes damage to organs through prolonged or repeated exposure.

Prevention statement(s)
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
Product name: BERYLLIUM OXIDE

Use only outdoors or in a well-ventilated area.

Contaminated work clothing should not be allowed out of the workplace.

Wear protective gloves/protective clothing/eye protection/face protection.

Wear respiratory protection.

Response statement(s)
- P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
- 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.
- P308 + P313 IF exposed or concerned: Get medical advice/attention.
- P310 Immediately call a POISON CENTER or doctor/physician.
- P314 Get medical advice/attention if you feel unwell.
- P320 Specific treatment is urgent - see first aid instructions (applies if immediate administration of antidote is required).
- P330 Rinse mouth.
- P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.
- P362 Take off contaminated clothing and wash before re-use.

Storage statement(s)
- P403 + P233 Store in a well-ventilated place. Keep container tightly closed (applies if the substance is volatile so as to generate a hazardous atmosphere).
- P405 Store locked up.

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

2.3 Other Hazards
No information provided.

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</th>
</tr>
</thead>
<tbody>
<tr>
<td>BERYLLIUM OXIDE</td>
<td>1304-56-9</td>
<td>215-133-1</td>
<td>99.8%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye
If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation
If inhaled, remove from contaminated area. To protect rescuer, use a Full-face Class P3 (Particulate) respirator where an inhalation risk exists. Apply artificial respiration if not breathing.

Skin
If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

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

First aid facilities
No information provided.

4.2 Most important symptoms and effects, both acute and delayed
No information provided.

4.3 Immediate medical attention and special treatment needed
Treat symptomatically.
5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Use an extinguishing agent suitable for the surrounding fire.

5.2 Special hazards arising from the substance or mixture
Non flammable. May evolve toxic gases (beryllium oxides) when heated to decomposition.

5.3 Advice for firefighters
Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use waterfog to cool intact containers and nearby storage areas.

5.4 Hazchem code
2Z

- Z Water Fog (or fine water spray if fog unavailable)
- Z Self Contained Breathing apparatus and protective gloves.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Clear area of all unprotected personnel. Contact emergency services where appropriate.

6.2 Environmental precautions
Prevent product from entering drains and waterways.

6.3 Methods of cleaning up
Contain spillage, then cover / absorb spill with moist sand or similar, collect and place in sealable containers for re-use, treatment and/or disposal. Avoid generating dust.

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
Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

7.2 Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area, removed from incompatible substances, heat or ignition sources and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. Check regularly for leaks or spills. Large storage areas should have appropriate ventilation systems.

7.3 Specific end use(s)
No information provided.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters
Exposure standards

<table>
<thead>
<tr>
<th>Substance</th>
<th>Reference</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beryllium &amp; compounds</td>
<td>SWA (AUS)</td>
<td>--</td>
<td>0.002</td>
<td>--</td>
<td>--</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, use local or extraction
Product name: BERYLLIUM OXIDE

Ventilation at source. Use a fully enclosed ventilated system (e.g. glove box) if available. Maintain dust levels below the recommended exposure standard.

**PPE**

- **Eye/ Face**: Wear safety glasses.
- **Hand**: Wear leather gloves.
- **Body**: Wear coveralls.
- **Respiratory**: Wear a Full-face Class P3 (Particulate) respirator. At high dust levels, wear a Powered Air Purifying Respirator (PAPR) with Class P3 (Particulate) filter.

### 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>WHITE SOLID</td>
</tr>
<tr>
<td>Odour</td>
<td>SLIGHT ODOUR</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>pH</td>
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<tr>
<td>Melting Point</td>
<td>2530°C</td>
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<tr>
<td>Boiling Point</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Flash Point</td>
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</tr>
<tr>
<td>Evaporation Rate</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Flammability</td>
<td>NON FLAMMABLE</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>Vapour Pressure</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Vapour Density</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>INSOLUBLE</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>Specific Gravity</td>
<td>3.0106</td>
</tr>
</tbody>
</table>

#### 9.2 Other information

No information provided.
10. STABILITY AND REACTIVITY

10.1 Reactivity
Carefully review all information in sections 10.2 to 10.6.

10.2 Chemical stability
Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions
Hazardous polymerization is not expected to occur.

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

10.5 Incompatible materials
Incompatible with oxidising agents (e.g. hypochlorites), acids (e.g. nitric acid), heat and ignition sources.

10.6 Hazardous decomposition products
May evolve toxic gases (beryllium oxides) when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Health hazard summary
HIGHLY TOXIC - IRRITANT. This product has the potential to cause serious adverse health effects. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in delayed effects which may be fatal. Chronic exposure may result in lung, liver, kidney and heart damage. Beryllium and beryllium compounds are classified as carcinogenic to humans (IARC Group 1). Individuals with pre-existing respiratory impairment (e.g. asthmatics) or liver, kidney or heart disease are advised to avoid exposure. Chronic exposure to beryllium may result in CBD (Chronic Beryllium Disease). May cause sensitisation by skin contact.

Eye
Irritant. Contact may result in irritation, lacrimation, pain and redness. May result in burns with prolonged contact.

Inhalation
Highly toxic - irritant. Acute exposure may result in irritation of the nose and throat, respiratory system damage, pulmonary oedema and death. Acute effects may be delayed 2 to 5 weeks. Chronic exposure may result in lung fibrosis and heart, kidney and liver damage. Beryllium is classified as carcinogenic to humans (IARC Group 1).

Skin
Irritant. Contact may result in irritation, redness, rash and dermatitis. Prolonged or repeated contact may result in burns. May cause sensitisation by skin contact.

Ingestion
Highly toxic. Ingestion may result in burns to the mouth and throat, nausea, vomiting, abdominal pain and diarrhoea. Ingestion of large quantities may result in ulceration, convulsions and coma.

Toxicity data
BERYLLIUM OXIDE (1304-56-9)
- TCLo (Inhalation): 17 mg/m³/5 hours/day/48 weeks - intermittent (rabbit)
- TDLo (Intravenous): 500 mg/kg/6 weeks - intermittent (rabbit)

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 Results of PBT and vPvB assessment
No information provided.

12.6 Other adverse effects
No information provided.
13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

**Waste disposal**
Reuse where possible. Return unused portion to the manufacturer. Dispose of in accordance with local regulations. Product may need to be treated prior to disposal. Contact the manufacturer/supplier for additional information (if required).

**Legislation**
Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

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

<table>
<thead>
<tr>
<th>Land Transport (ADG)</th>
<th>Sea Transport (IMDG/IMO)</th>
<th>Air Transport (IATA/ICAO)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1566</td>
<td>1566</td>
<td>1566</td>
</tr>
</tbody>
</table>

14.1 UN number
14.2 UN proper shipping name
BERYLLIUM COMPOUND, N.O.S.

14.3 Transport hazard classes

- **DG division**: 6.1 6.1 6.1
- **Subsidiary risk(s)**: None Allocated - -
- **Packing group**: II II II

14.4 Environmentals hazards
None Allocated

14.6 Special precautions for user

- **Hazchem Code**: 2Z
- **EMS**: F-A, S-A

15. REGULATORY INFORMATION

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

**Poison schedule**
Classified as a Schedule 6 Poison using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

**Classifications**
Carc. - Carcinogen
T - Toxic
T+ - Very toxic
Xi - Irritant

**Risk phrases**
- R25: Toxic if swallowed.
- R26: Very toxic by inhalation.
- R36/37/38: Irritating to eyes, respiratory system and skin.
- R43: May cause sensitisation by skin contact.
- R48/23: Toxic: danger of serious damage to health by prolonged exposure through inhalation.
- R49: May cause cancer by inhalation.

**Safety phrases**
- S22: Do not breathe dust.
- S24: Avoid contact with skin.
- S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
- S62: If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

Inventory listing(s)

Reviewed: 06 Aug 2013
Printed: 22 Apr 2015
**Product name**  
BERYLLIUM OXIDE

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

**UNITED STATES: TSCA (US Toxic Substances Control Act)**  
All components are listed on the TSCA inventory, or are exempt.

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**15.2 Chemical safety assessment**

No information provided.

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**16. OTHER INFORMATION**

**Additional information**

**PRIORITY POLLUTANT - ENVIRONMENTAL TOXICITY:** This product is known to adversely affect aquatic or animal life in small concentrations. Will accumulate or biomagnify.

**IARC GROUP 1 - CONFIRMED HUMAN CARCINOGEN.** This product contains an ingredient for which there is sufficient evidence to have been classified by the International Agency for Research into Cancer as a human carcinogen. The use of products known to be human carcinogens should be strictly monitored and controlled.

**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.

**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.

**COLOUR RATING SYSTEM:** RMT has assigned all ChemAlert reports a colour rating of Green, Amber or Red for the sole purpose of providing users with a quick and easy means of determining the hazardous nature of a product. Safe handling recommendations are provided in all ChemAlert 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.

While all due care has been taken by RMT in the preparation of the Colour Rating System, it is intended as a guide only and RMT does not provide any warranty in relation to the accuracy of the Colour Rating System. As far as is lawfully possible, RMT accepts no liability or responsibility whatsoever for the actions or omissions of any person in reliance on the Colour Rating System.

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**Abbreviations**

- ACGIH: American Conference of Governmental Industrial Hygienists
- CAS #: Chemical Abstract Service number - used to uniquely identify chemical compounds
- CNS: Central Nervous System
- EC No.: EC No - European Community Number
- EMS: Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
- GHS: Globally Harmonized System
- GTEPG: Group Text Emergency Procedure Guide
- IARC: International Agency for Research on Cancer
- LC50: Lethal Concentration, 50% / Median Lethal Concentration
- LD50: Lethal Dose, 50% / Median Lethal Dose
- mg/m³: Milligrams per Cubic Metre
- OEL: Occupational Exposure Limit
- PEL: Permissible Exposure Limit
- pH: relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
- ppm: Parts Per Million
- REACH: Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
- STEL: Short-Term Exposure Limit
- STOT-RE: Specific target organ toxicity (repeated exposure)
Product name: BERYLLIUM OXIDE

STOT-SE  Specific target organ toxicity (single exposure)
SUSMP  Standard for the Uniform Scheduling of Medicines and Poisons
SWA  Safe Work Australia
TLV  Threshold Limit Value
TWA  Time Weighted Average

Report Status: This ChemAlert report has been independently compiled by RMT’s scientific department utilising the original Safety Data Sheet (“SDS”) for the product provided to RMT by the manufacturer. The information is based on the latest chemical and toxicological research 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. It is an independent collation by RMT of information obtained from the original SDS for this product. Its content has not been authorised or verified by the manufacturer / distributor of the chemical to which it relates.

This ChemAlert report does not constitute the manufacturer's original SDS and is not intended to be a replacement for same. It is provided to subscribers of ChemAlert as a reference tool only, is not all-inclusive and does not represent any guarantee as to the properties of the product. 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 ChemAlert report, 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 ChemAlert report.

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End of Report