1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name ZIRCON SAND
Synonym(s) EUCLA ZIRCON • IMTI ZIRCON • MID-WEST ZIRCON • MURRAY BASIN ZIRCON • VIRGINIA ZIRCON • ZIRCON SAND • ZIRCONIUM SILICATE • ZSA

1.2 Uses and uses advised against

Use(s) MANUFACTURING • RAW MATERIAL

1.3 Details of the supplier of the product

Supplier name ILUKA RESOURCES INC. (VIRGINIA OPERATIONS)
Address 12472 St John Church Road, Stony Creek, Virginia, 23822-3239, UNITED STATES
Telephone (434) 348 4300
Fax (434) 246 3039
Website http://www.iluka.com

1.4 Emergency telephone number(s)

Emergency (434) 348 4300 (24 hour)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS

2.2 Label elements

No signal word, pictograms, hazard or precautionary statements have been allocated.

2.3 Other hazards

Zircon sand contains a small amount of respirable crystalline silica (up to 0.01%) and precautions should be taken to avoid inhaling the dust. The normal grain size of the product precludes it from being an inhalation hazard.

HMIS

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FLAMMABILITY</th>
<th>PHYSICAL HAZARD</th>
<th>PERSONAL PROTECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

NFPA

<table>
<thead>
<tr>
<th>HEALTH HAZARD</th>
<th>FLAMMABILITY</th>
<th>INSTABILITY</th>
<th>SPECIAL HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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>QUARTZ (CRYSTALLINE SILICA)</td>
<td>14808-60-7</td>
<td>238-878-4</td>
<td>0.05 to 0.5%</td>
</tr>
<tr>
<td>ZIRCONIUM SILICATE</td>
<td>14940-68-2</td>
<td>239-019-6</td>
<td>95 to 99%</td>
</tr>
<tr>
<td>KYANITE</td>
<td>1302-76-7</td>
<td>215-106-4</td>
<td>0.1 to 5%</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye
If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

Inhalation
If inhaled, remove person to fresh air and keep comfortable for breathing.

Skin
If on skin (or hair), brush off loose particles. If on clothing, brush off loose particles.

Ingestion
If swallowed, rinse mouth and get medical attention if you feel unwell.

First aid facilities
Eye wash facilities should be available.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING 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 if strongly heated.

5.3 Advice for firefighters

No fire or explosion hazard exists.

5.4 Hazchem code

None allocated.

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

Wear safety equipment as for normal handling. Avoid generating dust. Vacuum up if possible, otherwise sweep up and re-cycle. If the spilled product is not suitable for re-use, damp down, collect and where possible return to manufacturer for reprocessing. Otherwise dispose of to an approved landfill site and cover with clean fill in accordance with State/Local Council regulations.

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. Avoid breathing dust. Wash thoroughly after handling. If handling respirable flour it is advisable to use gloves and wash hands before eating, drinking or smoking to minimise inhalation or ingestion from hands.


7.2 Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use.

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 ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, Crystalline Quartz</td>
<td>ACGIH TLV (US)</td>
<td>--</td>
<td>0.025</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Titanium dioxide</td>
<td>ACGIH TLV (US)</td>
<td>--</td>
<td>10</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Zirconium and compounds, as Zr</td>
<td>ACGIH TLV (US)</td>
<td>--</td>
<td>5</td>
<td>--</td>
<td>10</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 dust levels below the recommended exposure standard.

PPE

<table>
<thead>
<tr>
<th>Eye / Face</th>
<th>Wear safety glasses in normal conditions. Wear dust-proof goggles in dusty conditions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands</td>
<td>Wear industrial grade gloves when handling the material.</td>
</tr>
<tr>
<td>Body</td>
<td>Where heavy contamination is likely, wear coveralls.</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Where an inhalation risk exists, wear a Class P1 (Particulate) respirator.</td>
</tr>
</tbody>
</table>

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>OFF WHITE TO BROWN GRANULAR SOLID</td>
</tr>
<tr>
<td>Odour</td>
<td>ODOURCELESS</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>NOT AVAILABLE</td>
</tr>
<tr>
<td>Melting point</td>
<td>2100°C to 2300°C</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>pH</td>
<td>5 to 7.5</td>
</tr>
<tr>
<td>Vapour density</td>
<td>NOT AVAILABLE</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>4.6 to 4.8</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>INSOLUBLE</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>NOT AVAILABLE</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>
10. STABILITY AND REACTIVITY

10.1 Reactivity
This material is considered inert.

10.2 Chemical stability
Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions
Polymerization is not expected to occur.

10.4 Conditions to avoid
No known conditions to avoid.

10.5 Incompatible materials
None in normal or expected use.

10.6 Hazardous decomposition products
This material will not decompose to form hazardous products.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

| Acute toxicity | Non toxic. There are no known hazards resulting from accidental ingestion of small amounts of zircon sand as may occur during normal handling. Ingestion of larger amounts may cause irritation to the gastro-intestinal system, mainly as a result of abrasion. |
| Skin | Not classified as a skin irritant. Contact may result in mechanical irritation. |
| Eye | Not classified as an eye irritant. Contact may result in mechanical irritation. |
| Sensitization | This product is not known to be a skin or respiratory sensitiser. |
| Mutagenicity | No evidence of mutagenic effects. |
| Carcinogenicity | Zircon sand contains a small amount of respirable crystalline silica (up to 0.01%) and precautions should be taken to avoid inhaling the dust. The normal grain size of the product precludes it from being an inhalation hazard. |
| Reproductive | No evidence of reproductive effects. |
| STOT – single exposure | No known effects from this product. |
| STOT – repeated exposure | Zircon sand contains a small amount of respirable crystalline silica (up to 0.01%) and precautions should be taken to avoid inhaling the dust. The normal grain size of the product precludes it from being an inhalation hazard. |
| Aspiration | This product does not present an aspiration hazard. |

12. ECOLOGICAL INFORMATION

12.1 Toxicity
This product is not anticipated to cause adverse effects to animal or plant life if released to the environment in small quantities. The material is unlikely to cause any environmental damage. It is insoluble in water and is unlikely to contaminate waterways or food chains.

12.2 Persistence and degradability
Not applicable.

12.3 Bioaccumulative potential
This product is not expected to bioaccumulate.
12.4 Mobility in soil
This product has low mobility in soil.

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
Disposal must be in accordance with Federal, State and Local Council regulations. If approved, may be transferred to an approved landfill site. Note: Many states are developing new regulations for the disposal of waste containing Naturally Occurring Radioactive Materials (NORM) or Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) above background levels. Consult and comply with current regulations.

Legislation
Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

14.4 Packing Group
None Allocated

14.5 Environmental hazards
No information provided

14.6 Special precautions for user
No information provided

Other information
May be transported normally as a non-hazardous material.

15. REGULATORY INFORMATION

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

US EPCRA and CAA Regulatory Information
The following components are subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112(r) of the Clean Air Act (CAA):

None of the components of this product are listed on the SARA/CERCLA/CASA lists.

Carcinogenicity
The following components are reported to be carcinogenic:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
<th>NTP</th>
<th>IARC</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUARTZ (CRYSTALLINE SILICA)</td>
<td>14808-60-7</td>
<td>Known</td>
<td>Group 1</td>
<td></td>
</tr>
</tbody>
</table>

TSCA
The following components are not listed on the TSCA Inventory list:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MONAZITE</td>
<td>1306-41-8</td>
</tr>
</tbody>
</table>

Inventory listing(s)
UNITED STATES: TSCA (US Toxic Substances Control Act)
All components are listed on the TSCA inventory, or are exempt.
16. OTHER INFORMATION

16.1 Additional information
For further information see Iluka Zircon Product Specification Sheets.

Note: This product contains small quantities of quartz and radionuclides, both known to the State of California to cause cancer.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

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.

16.2 Abbreviations

ACGIH American Conference of Governmental Industrial Hygienists
CAA Clean Air Act
CAS # Chemical Abstract Service number - used to uniquely identify chemical compounds
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CNS Central Nervous System
EC No. EC No - European Community Number
EMS Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)
EPCRA Emergency Planning and Community Right-to-Know Act
GHS Globally Harmonized System
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
NTP U.S. National Toxicology Program
OEL Occupational Exposure Limit
OSHA Occupational Safety and Health Administration
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
RCRA Resource Conservation and Recovery Act
RQ Reportable Quantity measured in pounds (304, CERCLA)
SARA Superfund Amendments and Reauthorization Act
STEL Short-Term Exposure Limit
STOT-RE Specific target organ toxicity (repeated exposure)
STOT-SE Specific target organ toxicity (single exposure)
TLV Threshold Limit Value
TPQ Threshold Planning Quantity measured in pounds (302)
TQ Threshold Quantity measured in pounds (CAA)
TWA Time Weighted Average
16.3 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.

16.4 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


[ End of SDS ]