SAFETY DATA SHEET

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.

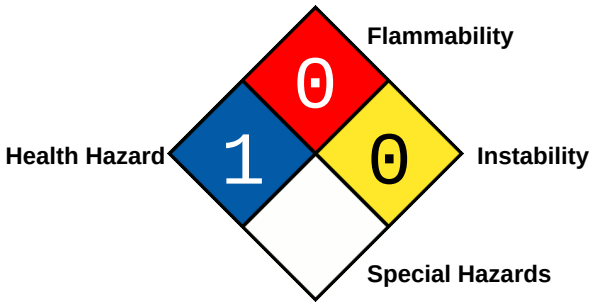
2.3 Other hazards

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

Health	N	1
Flammability		0
Physical Hazard		0
Personal Protection		0

NFPA



3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	0.05 to 0.5%
ZIRCONIUM SILICATE	14940-68-2	239-019-6	95 to 99%
KYANITE	1302-76-7	215-106-4	0.1 to 5%

ILMENITE	103170-28-1	-	0.1 to 1%
RUTILE (TIO2)	1317-80-2	215-282-2	0.1 to 1%
MONAZITE	1306-41-8	-	~ 0.02%

Ingredient Notes Respirable Crystalline Silica < 0.01%.

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

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Silica, Crystalline Quartz	ACGIH TLV (US)	--	0.025	--	--
Titanium dioxide	ACGIH TLV (US)	--	10	--	--
Zirconium and compounds, as Zr	ACGIH TLV (US)	--	5	--	10

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	OFF WHITE TO BROWN GRANULAR SOLID
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	2100°C to 2300°C
Evaporation rate	NOT AVAILABLE
pH	5 to 7.5
Vapour density	NOT AVAILABLE
Specific gravity	4.6 to 4.8
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Autoignition temperature	NOT AVAILABLE
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

Bulk density 2700 to 2950 kg/m³

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. Zircon sand contains low levels of naturally occurring radioactive elements of the uranium and thorium series. It has typical specific activities of 0.6 to 1.2 Bq/g (thorium-232) and 1.5 to 4.5 Bq/g (uranium-238). Low level gamma radiation from bulk or bagged stockpiles of zircon sand can increase gamma levels slightly above normal background.
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

NOT REGULATED FOR TRANSPORT

	LAND TRANSPORT (DOT)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	None Allocated	None Allocated	None Allocated
14.2 Proper Shipping Name	None Allocated	None Allocated	None Allocated
14.3 Transport hazard class	None Allocated	None Allocated	None Allocated
14.4 Packing Group	None Allocated	None Allocated	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:

Ingredient	CAS Number	NTP	IARC	OSHA
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	Known	Group 1	

TSCA

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

Ingredient	CAS Number
MONAZITE	1306-41-8

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.

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Prepared in accordance to OSHA Hazard Communication standard, 29 CFR 1920.1200.

[End of SDS]