SAFETY DATA SHEET

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product identifier

Product name **ZIRCON KYANITE CONCENTRATE**

Synonyms MID-WEST ZIRCON TAILINGS ● ZIRCON SAND ● ZIRCON TAILINGS

Uses and uses advised against

Uses MINERAL CONCENTRATE

Mineral concentrate suitable for upgrading to mineral sands products such as zircon and kyanite.

Details of the supplier of the product

Supplier name **ILUKA RESOURCES LIMITED**

Address Level 23, 140 St Georges Terrace, Perth, WA, 6000, AUSTRALIA

Telephone +61 8 9360 4700

Fax +61 8 9360 4777

Website http://www.iluka.com

Emergency telephone numbers

Emergency +61 8 9780 3555; +61 13 11 26 (PIC)

2. HAZARDS IDENTIFICATION

Emergency overview

Off-white to brown granular solid. Odourless. Non flammable.

Classification of the substance or mixture

NOT CLASSIFIED AS A HAZARDOUS SUBSTANCE OR MIXTURE

GHS Label elements

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

Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
QUARTZ (CRYSTALLINE SILICA)	14808-60-7	238-878-4	1 to 5%
RUTILE (TIO2)	1317-80-2	215-282-2	<3%
KYANITE	1302-76-7	215-106-4	50 to 60%
ZIRCONIUM SILICATE	14940-68-2	239-019-6	30 to 40%
ILMENITE	103170-28-1	-	<3%

Ingredient Notes Respirable Crystalline Silica <0.01%.

4. FIRST AID MEASURES

Description of first aid measures

Eye	If in eyes, rinse cautiously with water for several minutes, or until particle is removed. Remove contact lenses if present and easy to do - continue rinsing.
Inhalation	If inhaled move to fresh air and keep comfortable.
Skin	If skin or hair contact occurs, brush off loose particles. If on clothing, brush off loose particles. If irritation occurs, seek medical advice.
Ingestion	If swallowed, rinse mouth and get medical attention if you feel unwell.
First aid facilities	Eye wash facilities should be available.

Most important symptoms and effects, both acute and delayed

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

Specific advice for doctors

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

Special hazards arising from the substance or mixture

Non flammable. May evolve toxic gases if strongly heated.

Precautions and protective measures for fire fighting

No fire or explosion hazard exists.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Wear Personal Protective Equipment (PPE) as detailed in section 8 of the SDS. Contact emergency services where appropriate.

Environmental precautions

Prevent product from entering drains and waterways.

Methods of cleaning and suggested disposal materials

Contain spillage, then collect and place in suitable containers for reuse or disposal. Avoid generating dust.

Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

7. HANDLING AND STORAGE

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.

Conditions for safe storage

Store in a well ventilated area, removed from incompatible substances and foodstuffs. Ensure containers are adequately labelled, protected from physical damage and sealed when not in use. When stockpiled, ensure leachate and runoff cannot enter drains or waterways.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure standards

Ingredient	Reference	TWA		STEL	
		ppm	mg/m³	ppm	mg/m³
Respirable Crystalline Silica	OSHA PEL (US)	--	0.05	--	--
Titanium dioxide	SWA (AUS)	--	10	--	--
Zirconium and compounds, as Zr	NHFPC (China)	--	5	--	10
Zirconium compounds (as Zr)	SWA (AUS)	--	5	--	10

Biological limits

No biological limit values have been entered for this product.

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.

Personal protective equipment

Eye / Face Wear safety glasses and if there is a potential for dust, wear dust-proof goggles.

Hands Wear industrial grade gloves when handling material.

Body Where heavy contamination is likely, wear coveralls.

Respiratory 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

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	NOT AVAILABLE
Evaporation rate	NOT AVAILABLE
pH	5 to 7.5
Vapour density	NOT AVAILABLE
Specific gravity	3.8 to 4.1
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

Other information

Bulk density	2400 to 2500 kg/m³

10. STABILITY AND REACTIVITY

Chemical stability

Stable under recommended conditions of storage.

Possibility of hazardous reactions

Polymerization is not expected to occur.

Conditions to avoid

Avoid contact with incompatible substances.

Incompatible materials

Incompatible with acids (e.g. nitric acid).

Hazardous decomposition products

May evolve toxic gases when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

Acute toxicity	Non-toxic. There are no known hazards resulting from accidental ingestion of this product as may occur during normal handling. Ingestion of large quantities may cause irritation to the gastrointestinal system, mainly as a result of abrasion.
Skin corrosion/irritation	Not classified as a skin irritant. Contact may result in mechanical irritation.
Eye damage or irritation	Not classified as an eye irritant. Contact may result in mechanical irritation.
Respiration or skin sensitisation	This product is not known to be a skin or respiratory sensitiser.
Mutagenicity	No evidence of mutagenic effects.
Carcinogenicity	This product contains a small amount of respirable crystalline silica and precautions should be taken to avoid inhaling the dust. Crystalline silica is classified as carcinogenic to humans (IARC Group 1). The normal grain size of the product precludes it from being an inhalation hazard.
Reproductive toxic	Not classified as a reproductive toxin.
STOT - single exposure	No known effects from this product.
STOT - repeated exposure	The normal grain size of the product precludes it from being an inhalation hazard. This product contains a small amount of respirable crystalline silica and precautions should be taken to avoid inhaling the dust.
Aspiration hazard	This product does not present an aspiration hazard.

12. ECOLOGICAL INFORMATION

Toxicity

The material is unlikely to cause any environmental damage. It is insoluble in water and is unlikely to contaminate waterways or food chains.

Persistence and degradability

Not applicable.

Bioaccumulative potential

This product is not expected to bioaccumulate.

Mobility in soil

This product has low mobility in soil.

13. DISPOSAL CONSIDERATIONS

Waste materials and contaminated packaging	Disposal must be in accordance with Federal, State and Local Council regulations. If approved, may be transferred to an approved landfill site. 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.
Disposal considerations	Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

	LAND TRANSPORT (CNDG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
UN Number	None allocated.	None allocated.	None allocated.
Proper Shipping Name	None allocated.	None allocated.	None allocated.
Transport hazard class	None allocated.	None allocated.	None allocated.
Packing Group	None allocated.	None allocated.	None allocated.

Environmental hazards

No information provided.

Special precautions for user

15. REGULATORY INFORMATION

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

Regulation	Ingredient(s)	Listed
Inventory of Existing Chemical Substance in China (IECSC)	ILMENITE	
	KYANITE	Listed
	QUARTZ (CRYSTALLINE SILICA)	Listed
	RUTILE (TIO2)	
	ZIRCONIUM SILICATE	Listed

16. OTHER INFORMATION

Additional information

EXPOSURE STANDARDS - TIME WEIGHTED AVERAGES: Exposure standards are established on the premise of an 8 hour work period of normal intensity, under normal climatic conditions and where a 16 hour break between shifts exists to enable the body to eliminate absorbed contaminants. In the following circumstances, exposure standards must be reduced: Strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, 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: form of product; 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 report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

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
IARC	International Agency for Research on Cancer
LC50	Lethal Concentration, 50% / Median Lethal Concentration
LD50	Lethal Dose, 50% / Median Lethal Dose
mg/m^3	Milligrams per Cubic Metre
OEL	Occupational Exposure Limit
pH	relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm	Parts Per Million
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
TWA	Time Weighted Average

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.

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

Prepared in accordance with GB/T 16483 and GB/T 17519.

Version No: 2.2
14 Mar 2018

[End of SDS]