

SAFETY DATA SHEET



1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name ZIRCON CONCENTRATE

Synonym(s) ZIC, HT TAILINGS, ZIRCON SAND CONCENTRATE

1.2 Uses and uses advised against

Use(s) Mineral concentrate suitable for separation into component mineral sands products of Zircon, Rutile, Ilmenite, Leucoxene and Monazite

1.3 Details of the supplier of the product

Supplier name SIERRA RUTILE LIMITED

Address 110 Wilkinson Road, PO Box 59, Freetown, SIERRA LEONE

Telephone +232 76 801 416

Email srlfree@sierra-rutile.com

Website <http://www.sierra-rutile.com>

1.4 Emergency telephone number(s)

Emergency +232 796 252 103

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO GLOBALLY HARMONISED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS)

2.2 Label elements

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

2.3 Other hazards

No information provided.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content
ZIRCON (ZrSiO ₄)	14940-68-2	239-019-6	22-31%
ILMENITE	103170-28-1		3-5%
RUTILE (TiO ₂)	1317-80-2	215-282-2	13-16%
GARNET	1302-62-1		16-20%
QUARTZ	14808-60-7	238-878-4	26-36%
KYANITE	1302-76-7	215-106-4	3-5%
MONAZITE	1306-41-8		1.8-2.5%

Ingredient Notes Respirable Crystalline Silica < 0.01%.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye	If in eyes, hold eyelids apart and flush continuously with running water for several minutes, or until particle is removed. Remove contact lenses if present and 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.

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. Clear all unprotected personnel from area. 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 collect and place in suitable containers for reuse 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

Carefully read the product label before use. 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 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/m ³	ppm	mg/m ³
Respirable Crystalline Silica	OSHA PEL (US)	--	0.05	--	--
Titanium dioxide	SWA (AUS)	--	10	--	--
Zirconium compounds	SWA (AUS)	--	5	--	10
Uranium (natural)	SWA (AUS)	--	0.2	--	0.6

Biological limits

Ingredient	Determinant	Sampling Time	BEL
Uranium	Uranium in urine	End of shift	200 µg/L

Reference: ACGIH Biological Exposure Indices

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Mechanical extraction ventilation is recommended where an inhalation risk exists. Maintain dust levels below the recommended exposure standard.

PPE

- Eye / Face** Wear dust-proof goggles.
- Hands** Wear PVC or rubber gloves.
- Body** Wear coveralls when using large quantities or where heavy contamination is likely.
- Respiratory** Wear a Class P1 (Particulate) respirator where an inhalation risk exists. Wear a Powered Air Purifying Respirator (PAPR) with Class P3 (Particulate) filter or a Full-face Class P3 (Particulate) respirator at high dust levels.



9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	GREY TO PINK GRANULAR SOLID
Odour	ODOURLESS
Flammability	NON FLAMMABLE
Flash point	NOT RELEVANT
Boiling point	NOT AVAILABLE
Melting point	1550°C TO 1600°C
Evaporation rate	NOT AVAILABLE
pH	NEUTRAL
Vapour density	NOT AVAILABLE
Specific gravity	3.5 to 4.0
Solubility (water)	INSOLUBLE
Vapour pressure	NOT AVAILABLE
Upper explosion limit	NOT RELEVANT
Lower explosion limit	NOT RELEVANT
Partition coefficient	NOT AVAILABLE
Auto-ignition 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	2100 to 2300 kg/m ³
Specific activity	<10 Bq/g

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

Stable under recommended conditions of storage.

10.3 Possibility of hazardous reactions

Polymerisation is not expected to occur.

10.4 Conditions to avoid

Avoid contact with incompatible substances.

10.5 Incompatible materials

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

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

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 concentrate as may occur during normal handling. Ingestion of larger amounts may cause irritation to the gastrointestinal system, mainly as a result of abrasion.

Ingredient	Oral Toxicity (LD50)	Dermal Toxicity (LD50)	Inhalation Toxicity
Uranium	750 mg/kg	--	--

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 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 particle 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 This product contains low levels of naturally occurring radioactive elements of the uranium and thorium series. It has typical specific activities of 4.5 to 6.5 Bq/g (thorium-232) and 1.5 to 2.5 Bq/g (uranium-238). Low level gamma radiation from bulk or bagged stockpiles of zircon concentrate 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.

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 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. 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 CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE, IMDG OR IATA

	LAND TRANSPORT (ADG)	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

Hazchem code None Allocated

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 are 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 None allocated.

Risk phrases None allocated.

Safety phrases None allocated.

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

16. OTHER INFORMATION

Additional information **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 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: 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 report that would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate

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. Exposure standards must be reduced in the following circumstances: strenuous work conditions; hot, humid climates; high altitude conditions; extended shifts (which increase the exposure period and shorten the period of recuperation).

PRODUCT NAME ZIRCON CONCENTRATE

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
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
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)
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

Revision history

Revision	Description
1.0	Initial SDS creation
2.0	Align with Iluka Standard

Report status

This document represents 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 all due care has been taken to include accurate and up-to-date information in this SDS, Sierra Rutile Limited does not provide any warranty as to accuracy or completeness and accepts no liability for any loss, injury or damage (including consequential loss) that 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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