# *Material Safety Data Sheet*

## RUTILE SAND

ILUKA

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Identification**

Product Names : RUTILE SAND
Other Names : Rutile
Chemical Formula : $TiO_2$

**Company Identification**

| | | |
|---|---|---|
| Company | : **ILUKA Resources Inc.** | |
| Address | : Florida Operations | : Virginia Operations |
| | : 1223 Warner Road | : 12472 St John Church Road |
| | : Green Cove Springs | : Stony Creek |
| | : Florida 32043 – 4623 USA | : Virginia 23822 - 3239 USA |
| Telephone Number | : (904) 284 9832 | : (434) 246 8016 |
| Fax Number | : (904) 284 4006 | : (434) 246 3039 |
| Emergency No | : (904) 284 9832 (24 hours) | : (434) 246 8016 (24 hour) |

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredients (typical) | CAS Number | Weight % |
|---|---|---|
| Rutile | 13463-67-7 | 82 – 97% |
| Ilmenite | | <1% |
| Leucoxene | | 1 – 17% |
| Zircon | 14940-68-2 | 1% approx |
| Monazite | | <0.1% |
| Kyanite | 1302-76-7 | 0.5% |
| Quartz | 14808-60-7 | <0.1% |

## 3. HAZARDS IDENTIFICATION

*Not classified as hazardous according to US Agency for Toxic Substances and Disease Registry and the American Conference of Governmental Industrial Hygienists.*

**Potential Health Effects**

***Acute***

Swallowed — Non-toxic. There are no known hazards resulting from accidental ingestion of Rutile Sand as may occur during normal handling. Swallowing a large amount may result in irritation to the digestive system due to abrasiveness.

Eye — Solids and dust can be moderately irritating due to abrasiveness.

Skin — Low hazard.

Inhaled — The normal grain size of the product precludes it from being an inhalation hazard. Handling can however fracture grains, and in the dry state this can generate dust. This is normally regarded as general nuisance dust, but can be irritating if inhaled at high concentration. May cause symptoms such as coughing or sneezing.

***Chronic***

Silica — Crystalline silica is a known cause of lung fibrosis (silicosis). It has also has been classified as a human carcinogen. (International Agency for Research on Cancer).

| | |
|---|---|
| | Rutile Sand contains a very small amount of free quartz, (up to 0.1 %) and precautions should be taken to avoid inhaling the dust. |
| Radiation | In common with many minerals, Rutile Sand contains very low levels of naturally occurring radioactive elements of the uranium and thorium series. The main radiological hazard from the product is internal exposure to small amounts of alpha particles given off by inhaled dust. Low level gamma radiation from bulk or bagged stockpiles of Rutile Sand may present a lesser, external hazard.<br>Iluka Rutile Sand is exempt from NRC regulations for source material per 10 CFR 40, since it falls under the definition of unprocessed material containing less than 0.05 % uranium and thorium. |
| General | The main route of entry into the body is by inhalation of dust. |

**Carcinogenic Information**

The following components are listed by the IARC, NTP, OSHA and ACGIH as carcinogens. A "P" indicates a proposed carcinogen.

| Material | IARC | NTP | OSHA | ACGIH |
|---|---|---|---|---|
| Quartz | x | x | - | - |

## 4. FIRST AID MEASURES

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|---|---|
| Swallowed | First aid is unlikely to be required, but if necessary wash mouth out with water ensuring the mouthwash is not swallowed. Seek medical attention as a precaution if discomfort occurs. |
| Eye | Hold eyelid open and flush with plenty of clean water. Continue for at least 15 minutes or until grit is removed. Seek medical attention if soreness or irritation persists. |
| Skin | Gently remove contaminated clothing to avoid generating dust. Wash material from the skin. If repeated contact results in skin irritation, seek medical advice. Launder clothing before re-use. |
| Inhaled | Move to fresh air. Blow nose to remove particulates from nasal passages. If any adverse reaction develops, seek medical attention. |
| First Aid Facilities | Eye wash facilities. |
| Advice to Physician | Treat symptomatically. |

## 5. FIRE FIGHTING MEASURES

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|---|---|
| Flashpoint | : Not applicable |
| Flammability Limits | : Not applicable |
| General Hazard | This product is not flammable and does not support combustion. |
| Extinguishing Media | Use media suitable for the material that is burning. |

## 6. ACCIDENTAL RELEASE MEASURES

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|---|---|
| Spills and Disposal | 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 re-processing. Otherwise dispose of to an approved landfill site and cover with clean fill in accordance with State/Local Council regulations. |

## 7. STORAGE AND HANDLING

**Handling (Personnel)**

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.

## 8. EXPOSURE CONTROLS/PERSONEL PROTECTION

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|---|---|
| Engineering Controls | Ventilation requirements will depend on handling methods and the amount in use, but should be sufficient to maintain dust levels below exposure limits. Points of dust generation such as conveyor and hopper discharges should be equipped with an effective extraction system. |
| Personal Protection | Safety glasses with side shields or goggles. If risk of inhaling dust is present wear, at minimum, a dust mask (disposable or cartridge type). |

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|---|---|
| Exposure Standards (Occupational) | Inhalable general nuisance dust: [1] TLV – TWA: 10mg/$m^3$ (ACGIH)<br>Respirable quartz dust: TLV – TWA: 0.1mg/$m^3$ (ACGIH) |

[1] TLV (Threshold Limit Value) is the exposure standard term used by American Conference of Governmental Industrial Hygienists (ACGIH)

Radiation exposure[2] :

Occupational exposure should be as low as reasonably achievable, (ALARA principle), but should not exceed a total of 100 milli-seiverts over five consecutive years. (ICRP).

[2] Recommendation of the International Commission on Radiological Protection, ICRP Publication 60, Annals of the ICRP Vol 21, No 1 – 3 1991

## 9. PHYSICAL AND CHEMICAL PROPERTIES

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|---|---|
| Appearance (Form) | : Dark brown to black free running sand. Grains can be ruby red under the microscope. Odourless and tasteless |
| Melting Point | : >1825$^o$ C |
| Vapour Pressure | : Not volatile |
| Evaporation Rate | : Not volatile |
| Specific Gravity | : 4.0 - 4.3 |
| Solubility in Water | : Insoluble |
| pH | : No data |
| Bulk Density | : 2400 - 2700 kg/$m^3$ |
| Grain size (AFS No) | : 75 - 95 |

## 10. STABILITY AND REACTIVITY

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|---|---|
| Reactivity | : Inert |
| Chemical Stability | : Stable |
| Incompatibilities | : None in normal or expected use. |
| Decomposition | : Decomposition will not occur. |

## 11. TOXICOLOGICAL INFORMATION

No toxicological information available.

## 12. ECOLOGICAL INFORMATION

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

## 13. DISPOSAL CONSIDERATIONS

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.

## 14. TRANSPORT INFORMATION

May be transported normally as a non-hazardous material.

## 15. REGULATORY INFORMATION

**U.S. Federal Regulations**

TSCA Inventory Status : Reported/Included

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

| | |
|---|---|
| Acute | : No |
| Chronic | : Yes |
| Fire | : No |
| Reactivity | : No |
| Pressure | : No |

**LISTS:**

| | |
|---|---|
| SARA Extremely Hazardous Substance | : No |
| CERCLA Hazardous Material | : No |
| SARA Toxic Chemical | : No |

## 16. OTHER INFORMATION

For further information see Iluka Rutile Product Specification Sheets

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

**Preparation Information**

This MSDS has been prepared by Iluka Resources Inc, Safety Health and Environment Department.

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|---|---|
| Revision Number | : US - 2 |
| Date of Issue | : October 2003 |
| Replaces: | : US – 1 January 2000 |