MATERIAL SAFETY DATA SHEET
ILMENITE

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identification

Product Names: Ilmenite

Other Names: Ilmenite Sand

Chemical formula: $FeO.Fe_2O_3.TiO_2$

Company Identification

Company: Mineral Sand Resources (Pty) Ltd

Address: Farm Geelwal Karoo

Koekenaap, Western Cape

South Africa

Telephone Number: (+27)87 150 4010

Fax Number: n/a

Emergency No: (+27)87 150 4010

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients (typical)	Weight %
Ilmenite	78.66%
Rutile	0.43%
Zircon	2.80%
Leucoxene	0.15%
Garnet	16.52%
Others	1.44%

Typical Analysis – Chemical

Chemical Name	CAS number	Proportion
TiO_2	13463-67-7	35.56%
SiO_2	14808-60-7	9.12%
FeO	1345-25-1	33.30%
Fe_2O_3	1309-37-1	47.62%
ZrO_2	1314-23-4	2.45%
Al_2O_3	1344-28-1	3.92%
P_2O_5	1314-56-3	0.16%
Cr_2O_3	1333-82-0	0.18%
V_2O_5	1314-62-1	0.20%
Nb_2O_5	1313-96-8	0.04%
Th	7440-29-1	265.71 mg/kg
MnO	1344-43-0	1.17%
MgO	1309-48-4	1.47%
CaO	1305-78-8	0.72%

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 Ilmenite Sand as may occur during normal handling. Swallowing a large amount may result in irritation to the digestive system due to abrasiveness.

Eye. The Ilmenite grains 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, however handling can cause grains to fracture so producing 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). Ilmenite Sand contains a small amount of free quartz, (up to 0.5 %) and precautions should be taken to avoid inhaling the dust.

Radiation. In common with many minerals, Ilmenite 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 from small amounts of alpha particles given off by inhaled dust. Low level gamma radiation from bulk or bagged stockpiles of Ilmenite sand may present a lesser, external hazard. MSR Ilmenite 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.

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

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

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

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 reprocessing. Otherwise dispose of to an approved landfill site and cover with clean fill in accordance with local regulations.

7. STORAGE AND HANDLING

Handling (Personnel)

Avoid breathing dust. Wash thoroughly after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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. Indoor points of dust generation such as conveyor and hopper discharges should be equipped with an effective extraction system.

If using MSR Ilmenite sand as an abrasive blast agent in confined areas, airborne dust should be controlled by a physical enclosure in accordance with 29 CFR 1910.94 Ventilation (a) Abrasive Blasting.

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).

OSHA (29 CFR 1910.94) requires a continuous flow air-line supplied respirator with hood for protection in abrasive blasting operations.

Exposure Standards Inhalable general nuisance dust:

([1] TLV, Occupational) TWA – 10mg/m3 (ACGIH)

Respirable quartz dust:

TWA – 0.1mg/m3 (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

Appearance (Form):	Black free running sand, odourless and tasteless
Melting Point:	1400 °C (approximately)
Vapour Pressure:	Not volatile
Evaporation Rate:	Not volatile
Specific Gravity:	4.5 (approximately)
Solubility in Water:	Insoluble
pH:	6 – 7.5
Bulk Density:	2600 - 2850 kg/m^3
Grain size:	75 to 600 micron

10. STABILITY AND REACTIVITY

Reactivity:	Inert
Chemical Stability:	Stable

Incompatibilities: None in normal or expected use.

Decomposition: Decomposition will not occur.

11. TOXICOLOGICAL INFORMATION

Non-toxic

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 local 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

Transport is not regulated and may be transported as a non-hazardous material. Trucks transporting bulk material must be covered to prevent dust generation.

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

Radiological protection

The regulation pertaining to radiological protection vary from country to country. It is the responsibility of the buyer to ensure that those are met in accordance with its country law.

16. OTHER INFORMATION

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

Preparation Information

This MSDS has been prepared by Mineral Sands Resources (Pty) Ltd, Safety Health and Environment Department.