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MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT NAME: POWERBLAST LS **MSDS #:** 391-0

CHEMICAL NAME AND SYNONYMS: $(\text{Fe,Mg})_2\text{Al}_9\text{Si}_4\text{O}_{23}(\text{OH})$, FeTiO_3 , $\text{Fe}_2\text{Ti}_3\text{O}_9$, TiO_2 , ZrSiO_4

MATERIAL IDENTIFICATION AND USE: This material is a dark reddish brown, granular aggregate for use as a blasting media. This product contains less than 1% free crystalline silica. **Note:** This MSDS covers many products and individual physical and chemical properties will vary. Consult individual Technical Data Sheet's for specifics.

MANUFACTURER AND SUPPLIER:

OPTA MINERALS
407 Parkside Drive
Waterdown, Ontario
L0R 2H0
Telephone: 905-689-6661
Emergency: 905-689-6661, Ext. 222

SECTION 2 – COMPOSITION/INFORMATION ON INGREDIENTS

The product consists of dry, odourless, dark reddish brown sand grains. Major ingredients are:

Ingredients	Chemical formula by weight	Typical %	CAS #
Aluminium Oxide	Al_2O_3	~44.0	1344-28-1
Amorphous Silica	SiO_2 (total)	~27.1	61790-53-2
Iron Oxide	Fe_2O_3	~15.7	1309-37-1
Titanium Dioxide	TiO_2	~ 8.14	13463-67-7
Zirconium Silicate	$\text{ZrO}_2 \cdot \text{SiO}_2$	~ 2.96	14940-68-2
Magnesium Oxide	MgO	~ 1.73	1309-48-4
Manganese Oxide	MnO	~ 0.28	
Quartz	SiO_2	0.5 – 1.0	14808-60-7
Uranium (natural)	U (natural)		7440-29-1
Thorium (natural)	Th (natural)	<0.05	7440-61-1

SECTION 3 – HAZARDS IDENTIFICATION

Acute

INGESTION

Non-toxic by ingestion. Swallowing a large amount may result in irritation to the digestive system due to abrasiveness.

EYE CONTACT

Solids and dust of dried product can be irritating due to abrasiveness.

SKIN CONTACT:	Can cause skin irritation due to abrasiveness
INHALATION:	As shipped from the manufacturer, the grain size of the product is outside the respirable range (>10um diameter) and precludes it from being an inhalation hazard. Handling and processing can however fracture grains, and in the dry state this can generate dust. It can be irritating if inhaled at high concentration. May cause symptoms such as coughing or sneezing.
Chronic	
General	The main exposure route to the constituents in Staurolite Concentrate is dust inhalation.
Silica	Crystalline silica is a know cause of lung fibrosis (silicosis). It has also been classified as a human carcinogen. (International Agency for Research on Cancer). Staurolite concentrate contains quartz, (up to 1%) and precautions should be taken to avoid inhaling the dust.,
Uranium Thorium	As is common with many minerals, Staurolite Concentrate contains very low levels (below 0.05% by weight) of naturally occurring radioactive elements of the uranium and thorium series. Internal exposure via inhaled dust is the main exposure. Close proximity to large quantities (bulk or stockpiles) of staurolite concentrate over long periods (2000 hours per year) may result in direct exposure. This Staurolite concentrate is exempt from the NRC regulations for source material per 10 CFR40 because it is below the 0.05% uranium and thorium.

SECTION 4 – FIRST AID MEASURES

INGESTED	Wash mouth out with water ensuring the mouthwash is not swallowed. Seek medical attention as a precaution if discomfort occurs.
EYE	Check for and remove any contact lenses. Hold eyelid open and flush with plenty of clean water. Continue for al least 15 minutes or until grit is removed. Seek medical attention if irritation persists. DO NOT RUB EYES!
SKIN	Gently remove contaminated clothing to avoid generating dust. Wash material from the skin and wash remaining material from the skin with gentle water stream. If irritation persists, seek medical advice. Launder clothing before re-use.
INHALATION	Move to fresh air. Blow nose to remove particles from nasal passages. If any adverse reaction develops, seek medical attention
First Aid Facilities	Eye wash facilities
Advice to Physician	Treat symptomatically

SECTION 5 – FIRE FIGHTING MEASURES

Flashpoint	Not applicable
Flammability limits	Not applicable
General Hazard	This product is not flammable or combustible and does not support combustion
Extinguishing media	Use media suitable for the material that is burning

SECTION 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 Federal, Provincial, State and Local regulations.

SECTION 7 - STORAGE AND HANDLING

Handling (Personnel): Avoid breathing dust. Use gloves and wash hands before eating, drinking or smoking to minimize inhalation or ingestion from hands.

SECTION 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. Points of dust generation such a conveyor and hopper discharges should be equipped with an effective extraction system.

If using staurolite concentrate for sand blasting, use in a blasting chamber with mechanical extraction ventilation that meets OSHA 29 CFR part 1910.94. Where sand blasting occurs outside of chamber, minimize dust contamination of surroundings and maintain dust levels below the recommended exposure standards.

Personal Protection: Wear safety glasses with side shields or dust proof goggles to protect against abrasive effects. Use NIOSH/MSHA approved respiratory protection programs that meet OSHA 29 CFR part 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator. When sand blasting, use a type CE abrasive blast supplied air respirator covering head, neck and shoulders a per CFR 1910.94 (a)(5).

Exposure Standards:

COMPONENT	CAS #	% by Wt	OSHA PEL	OSHA CEILING	ACGIH TLV	ACGIH STEL	LISTED CARCINOGEN (YES/NO)		
			[mg/m ³]	[mg/m ³]	[mg/m ³]	[mg/m ³]	NTP	IARC	OSH A
Zircon (ZrO ² ·SiO ²)	14940-93-8	3-6	5 (as Zircon)	N?A	5 (as Zircon)	10 (as Zircon)	NO	NO	NO
Quartz (SiO ²)	14808-60-7	0.5 - 1	See Footnote 3		0.025 as respirable dust			Yes Group 1	
Ilmenite, Rutile Leucoxene as Titanium Oxide TiO ₂	13463-67-7	11– 13	5 (resp.) 10 (total)		10			Not Classified Group 3	
Kyanite, Staurolite, Sillmanite (See footnote 2)	12182-56-8 1302-76-7	76–86	5 (respirable) 15 total		10		NO	NO	NO
Uranium (natural)	7440-61-1	<0.05	0.05 (insoluble) as U		0.2 As U	0.6 (insoluble) as U		Inad-equate	
Thorium (natural)	7440-29-1	<0.05	Not established		--	--		Inad-equate	

NOTES:

1. Exposure limits listed for each ingredient is for exposure to dust that may be generated during product transfer and handling
2. OSHA standards for Kyanite, Staurolite and Sillimanite are particulate not otherwise regulated (PNOR) ("Nuisance Dust")
3. OSHA Table Z-3 establishes the following limits for quartz

OSHA Table Z-3	Mmpcf (a)	Mg/m ³
Quartz (respirable)	250 (b) % SiO ₂ + 5	10 mg/m ³ % SiO ₂ + 2
Quartz (total)	-----	30 mg/m ³ % SiO ₂ + 2

Notes to Table Z-3

(a)mmpcf = millions of particles per cubic foot of air, based on impinger samples counted by light-field techniques.
(b)Percent quartz is the amount determined from airborne samples. Both concentrations and percent quartz determined from the fraction passing size selector impactor having characteristics set forth in 29 CFR 1910.1000 table Z3 footnote (e)

Uranium, Thorium Exposure² Uranium and thorium are naturally occurring radioactive materials (NORM). Occupational exposure to NORM should be as low as reasonably achievable, (ALARA principle), and should not exceed a total of 100 milliseiverts (100millirems) per year over five consecutive years (ICRP).

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

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Dry, dark reddish brown sand grains
ODOUR: Odourless
pH: 6 - 8
VAPOUR PRESSURE Not volatile
MELTING POINT: 1380 – 1540 C
EVAPORATION RATE: Not volatile
SOLUBILITY IN WATER (%): Insoluble.
SPECIFIC GRAVITY 3.7 – 3.8
BULK DENSITY 1900 kg/m³
GRAIN SIZE (AFS#) 95 -110

SECTION 10 – STABILITY AND REACTIVITY

REACTIVITY: Inert
CHEMICAL STABILITY Stable
INCOMPATIBILITIES: None in normal or expected use
DECOMPOSITION: Decomposition will not occur

SECTION 11 – TOXICOLOGICAL INFORMATION

No toxicological information available.

SECTION 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 chain.

SECTION 13 – DISPOSAL CONSIDERATIONS

Disposal must be in accordance with Federal, Provincial, State and local regulations. If approved, may be transferred to an approved landfill site.

NOTE: many states are developing new regulations for disposal of waste containing Natural Occurring Radioactive Materials (NORM) above background levels. Consult and comply with current regulations.

SECTION 14 – TRANSPORT INFORMATION

Activity is < 2,000 pCi/gram; not regulated by U.S. DOT OR IMO.

SECTION 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

SECTION 16 – OTHER INFORMATION

California Proposition 65 Warning: This product contains substances know to the State of California to cause cancer.

PREPARATION DATE OF MSDS

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DATE ISSUED: March 19, 2008

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For non-emergency questions, please contact your sales person.
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