

**HCS OSHA-GHS
Safety Data Sheet**

Revision Date 09/26/2016

1. PRODUCT AND COMPANY IDENTIFICATION

Trebol USA, LLC
641 S. Rosemary Avenue
Andrews, SC 29510

EMERGENCY PHONE NUMBERS:

Chemtrec: (800) 424-9300 (24 hrs) or (703) 527- 3887
Medical: Poison Control Center: (800) 222-1222 (24 hrs)

Information Telephone Numbers	Phone Number	Available Hours
Product Information	843-520-1100	8:30 a.m. - 4:30 p.m. (Eastern)

Product Name	Zircon (All Grades)
Product Synonym(s)	See miscellaneous section for all applicable grades covered by this (M)SDS.
Chemical Family	Inorganic silicate
Chemical Formula	ZrO ₂ SiO ₂
Chemical Name	Zirconium Silicate
EPA Reg Number	
Product Use	Ceramics, Investment Casting

2. HAZARDS IDENTIFICATION**Hazard Summary**

Physical Hazards	Not classified for physical hazards.
Health Hazards	Not classified for health hazards.
Environmental Hazards	Not classified for environmental hazards.

GHS Label elements, including precautionary statements

Pictogram	None
Signal word	None
Hazard statement(s)	None
Precautionary statement(s)	None

Potential Health Effects

Inhalation	Can cause respiratory tract irritation.
Skin	May irritate skin.
Eyes	May irritate eyes.
Ingestion	May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENT

Ingredient Name	CAS Registry Number	EC Number	Typical Wt. %	GHS Classification
Zirconium Silicate	14940-68-2	239-19-6	94-100%	Not classified
Aluminum Silicate	1302-76-7	215-106-4	<2.0%	Not classified

This product also includes a small amount (<0.05%) quartz. Quartz as respirable crystalline silica is listed as a known human carcinogen. The quantity of quartz in this product does not require listing on this SDS nor GHS classification. However, Trebol chooses to disclose this information to users.

4. FIRST AID MEASURES

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

IF IN EYES, immediately flush with plenty of water. Get medical attention if irritation persists.

IF ON SKIN, flush the area with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if irritation develops and persists.

IF SWALLOWED, induce vomiting immediately as directed by medical personnel.

NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5. FIRE-FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	None	
Flash Point	None	Flash Point Method
Flammable Limits- Upper	NA	
Lower	NA	

Extinguishing Media

Product does not burn. Use extinguishing media appropriate to surrounding fire conditions.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full firefighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Firefighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

None known.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing dust. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

In Case of Spill or Leak

Stop the leak, if possible. Ventilate the space involved. Sweep up, place in container for recovery or disposal.

Reduce dust spreading with a water spray. Prevent waterway contamination. Construct a dike to prevent spreading. Protect workers with water spray. Collect run-off water and transfer to drums or tanks for later disposal. Avoid creating a dusty atmosphere. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Clean up procedures: Transfer to containers, preparatory for later recovery or disposal. Avoid generation of dusts. Remove from spill location. Flush area with water spray, collect rinsate.

7. HANDLING AND STORAGE Handling

Precautions for safe handling.

Avoid contact with eyes. Avoid creating dust in handling, transfer or clean-up. Avoid breathing dust. Use only with adequate ventilation. Wash thoroughly after handling.

Storage

This material is not hazardous under normal storage conditions; however, material should be stored in closed containers, in a secure area to prevent container damage and subsequent spillage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment immediately available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing dust. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

		<u>Exposure Limit Value</u>
Quartz		
ACGIH TWA	Respirable particle	0.025 mg/m3
Zirconium Silicate		
ACGIH STEL	-Zirconium compound, as Zr	10 mg/m3
ACGIH TWA	-Zirconium compound, as Zr	5 mg/m3
OSHA TWA PEL	-Zirconium compound, as Zr	5 mg/m3

-Only those components with exposure limits are printed in this section.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	White granules or powder with no characteristic odor
pH	NE
Specific Gravity	4.68
Vapor Pressure	NA

Vapor Density	NA
Melting Point	NE
Freezing Point	NA
Boiling Point	NA
Solubility In Water	Insoluble

10. STABILITY AND REACTIVITY

Chemical stability

This material is chemically stable under normal and anticipated storage and handling conditions.

Conditions to avoid

No data available

Materials to avoid

Strong oxidizing agents

Hazardous decomposition products

Zircon sand will disassociate to Zirconium Dioxide (ZrO_2) and Silicon Dioxide (SiO_2) when heated above 1540 degrees Celsius.

11. TOXICOLOGICAL INFORMATION

Data on this material and/or its components are summarized below.

Zirconium Silicate

Following single or repeated intraperitoneal doses, this material was considered to be physiologically inert. Following repeated inhalation exposure to dust of this material, radiographic lung shadows were reported in rats; however, histological examination of the lung tissues showed no changes. Following implantation of a disc of this material into the muscle tissue of rabbits, histological examination of the surrounding tissues did not show any effects that were different from other materials used in medical implants. This material contains trace quantities of naturally occurring radioactive uranium, thorium and radium (106-120 Pico curies/gram). Overexposure to respirable dusts containing radioactive uranium, thorium and radium may cause lung cancer. (Zircon is exempt from NRC regulations for source material per 10 CFR 40, since it falls under the definition of material containing less than 0.05% uranium or thorium. However, calculations show that observance of 2.2-2.8 mg/m³ of respirable dust will, under voluntary guidelines, ensure that intake is less than 10% of the annual limits on intake (ALIS) specified in 10 CFR 20.1502(B) and NRC standards for protection against radiation for uranium, thorium, radium and radioactive daughter decay products).

Zirconium and Zirconium Compounds

Single exposure (acute) studies indicate that zirconium and zirconium compounds are slightly toxic to mice, rats and guinea pigs if swallowed [LD₅₀ 990 to 2,290 mg/kg (insoluble zirconium salts)] and practically non-toxic to rats, guinea pigs, rabbits, cats and dogs if inhaled (LC₅₀ >6 mg/l).

Aluminum Silicate

Workers exposed to a hydrated clay of this material, have been reported to have experienced lung effects ranging from mild pneumoconiosis, a non-disabling lung change, to progressive pulmonary fibrosis and emphysema. Exposure to the anhydrous form of this material used for refractory and porcelain manufacture, has been reported to cause interstitial pulmonary fibrosis in workers and in experimental animals; these findings are complicated by the presence of cristobalite. Another report has indicated that occupational exposure to this material in kitty litter dust caused pulmonary fibrosis; however, further evaluation of these workers and lack of pulmonary toxicity in animals from instillation of this material in the lungs suggests that smoking behavior may have been the most significant causative factor. Oral administration of aluminum silicate to dogs and rats showed no evidence of toxicity to kidneys or other organs. In vitro studies and long-term inhalation studies with this material have shown aluminum silicate to be less cytotoxic and carcinogenic than other inorganic fiber dusts. Other studies have suggested an association between aluminum and neurological degenerative diseases, including Alzheimer's disease, dialysis dementia and reduced neural-motor functions. In aluminum sensitive animal species such as cats and rabbits, a pathological change noted in neurons is an accumulation of neurofibrillary tangles. Neurofibrillary tangles and increased brain levels of aluminum are also observed in patients with Alzheimer's disease and dialysis dementia; however, these tangles are associated with a variety of neurological disorders. Because there are scientific questions regarding these studies, the causative

association between aluminum and these diseases has not been demonstrated. In a study of occupationally exposed workers to aluminum dusts, no increased mortality from Alzheimer's disease or other neurological diseases was noted.

Quartz

Chronic inhalation of crystalline silica may cause a progressive pneumoconiosis (silicosis), a form of disabling lung disease (pulmonary fibrosis). Data from animal studies on crystalline forms of silica confirm the capacity of free crystalline silica to induce a fibrinogenic response in lungs. Studies on a variety of laboratory animals (rats, guinea pigs, rabbits, and monkeys) using inhalation as well as intratracheal routes of exposure indicate the ability of crystalline silica to produce silicosis similar to that seen in man. In addition, experiments in animals have confirmed human experience that the presence of crystalline silica in the lung increased susceptibility to tuberculosis and other lung infections. Crystalline silica inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), and respirable forms of crystalline silica are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program. The IARC listing is based on the determination that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz from occupational exposures. Epidemiology studies cited by IARC give indications of increased risk for lung cancer from inhaled crystalline silica (quartz) resulting from occupational exposure. Studies involving heavy industrial exposure to silica in granite and foundry workers, brick factories and sandblasting produced increased levels of protein and enzymes in urine, which is indicative of kidney damage.

Potential health effects

Inhalation	May be harmful if inhaled. Causes respiratory tract irritation.
Ingestion	May be harmful if swallowed.
Skin	May be harmful if absorbed through skin. Causes skin irritation.
Eyes	Causes eye irritation.

Zircon is not anticipated to be carcinogenic, mutagenic, or toxic to reproduction.

12. ECOLOGICAL INFORMATION

Toxicity

Ecotoxicological Information

Data on this material and/or its components are summarized below.

Zirconium and Zirconium Compounds

Zirconium is moderately toxic to green algae (96-hr EC50 2.6 mg/l), no more than slightly toxic to rainbow trout (96-hr LC50 >20 mg/l), slightly to moderately toxic to bluegill sunfish (96-hr LC50 15-240 mg/l) and slightly toxic to practically non-toxic to fathead minnow (96-hr LC50 14-115 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Zirconium and Zirconium Compounds

Zirconium is an element and will not degrade. It occurs in the environment in insoluble forms which remain unavailable to living organisms. In a bioconcentration assay in bluegill sunfish, zirconium showed a low potential bioaccumulation with a bioconcentration factor of 3.3.

13. DISPOSAL CONSIDERATIONS

Waste Disposal

Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14. TRANSPORT INFORMATION

DOT (US) Name	NOT REGULATED
DOT Technical Name	NOT REGULATED
DOT Hazard Class	NOT REGULATED
IMDG	NOT DANGEROUS GOODS
IATA	NOT DANGEROUS GOODS
UN Number	NOT DANGEROUS GOODS
DOT Packing Group	NOT DANGEROUS GOODS
RQ	NA

15. REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	N
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	<u>CERCLA RQ</u>	<u>SARA TPQ</u>
Quartz	NE	NE
Zirconium Silicate	NE	NE
Aluminum silicate	NE	NE

SARA Title III, Section 313

This product does not contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

California Prop 65 - Carcinogen

This product does contain the following chemical(s), as indicated below, currently on the California list of Known Carcinogens.
Quartz (less than 0.05%)

European Economic Community Information

EU RISK PHRASES: R42 - May cause sensitization by inhalation, R43 - May cause sensitization by skin contact, R36 - Irritating to eyes.

Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Aluminum silicate
Quartz
Zirconium Silicate

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Aluminum silicate
Quartz
Zirconium Silicate

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Aluminum silicate
Quartz
Zirconium Silicate

16. OTHER INFORMATION

HMIS Classification

Health hazard:	1
Flammability:	0
Physical hazards:	0

NFPA Rating

Health hazard:	1
Fire:	0
Reactivity Hazard:	0

Revision Information

Revision Date	26 SEP 2016	Revision Number	11
Supersedes Revision Dated	06 APR 2016		

Revision Summary

Updated section 2 Hazards Identification GHS label elements.

Key

NE= Not Established; NA= Not Applicable; ® = Registered Trademark

Miscellaneous

This MSDS covers the following grade of Zircon: Granular, Granular SA, 140 Mesh, 200 Mesh, 200 Mesh SA, 325 Mesh, 325 Mesh SA, 400 Mesh, 600 Mesh, and Milltrox.

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