

SECTION 1. IDENTIFICATION

GHS product identifier Alumina Zirconia Composite Ceramic

Chemical name Fired or Sintered Zirconia Ceramic Formed Parts

Other means of identification CZ1, CZ3, CZ6, CZ8, CZ9, AZ-25, AZ-67, AZ-93, CZ-9, CZR, CZRy, ZTA, ZTA-A3, ZTA-90

Product Type Solid

**RELEVANT IDENTIFIED USES OF THE
SUBSTANCE OR MIXTURE AND USES
ADVISED AGAINST**

Identified uses Not available

Supplier's details CoorsTek, Inc.
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(with hours of operation)** +1 303 271 7100
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SECTION 2. HAZARDS IDENTIFICATION

OSHA/HCS status While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture Not classified

GHS LABEL ELEMENTS

Signal word No signal word

Hazard statements No known significant effects or critical hazards

PRECAUTIONARY STATEMENTS

Prevention Not applicable

Response Not applicable

Storage Not applicable

Disposal Not applicable

Hazards not otherwise classified None known

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture Mixture

Chemical name Fired or Sintered Zirconia Ceramic Formed Parts

Other means of identification CZ1, CZ3, CZ6, CZ8, CZ9, AZ-25, AZ-67, AZ-93, CZR, CZRy, ZTA, ZTA-A3, ZTA-90

CAS NUMBER/OTHER IDENTIFIERS

CAS number Not applicable

Product code Not available

INGREDIENT NAME	%	CAS NUMBER
Zirconium dioxide	10 - 70	1314-23-4
Aluminium oxide	30 - 90	1344-28-1
Zinc oxide	0 - 5	1314-13-2
Chromium (III) oxide	0 - 5	1308-38-9
Yttrium oxide	0 - 5	
Magnesium oxide	0 - 3	

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4. FIRST AID MEASURES
**DESCRIPTION OF NECESSARY
FIRST AID MEASURES**

- Eye contact** Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Get medical attention if irritation occurs.
- Inhalation** Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- Skin contact** Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.
- Ingestion** Not a likely route of exposure. If large amounts of product are ingested, give two glasses of water and get prompt medical attention. Never give anything by mouth to an unconscious person.

SECTION 4. FIRST AID MEASURES, CONTINUED
**MOST IMPORTANT SYMPTOMS/EFFECTS,
ACUTE AND DELAYED**
Potential acute health effects

Eye contact	High dust concentrations from grinding, sanding, or machining formed parts in a way that generates dust may cause mechanical eye irritation.
Inhalation	High dust concentrations from grinding, sanding, or machining formed parts in a way that generates dust may cause upper respiratory irritation.
Skin contact	Prolonged skin contact with dust may result in dryness. If no dust is generated from fired parts, no acute effects are known.
Ingestion	No known significant effects or critical hazards

OVER-EXPOSURE SIGNS/SYMPTOMS

Eye contact	No known significant effects or critical hazards
Inhalation	No known significant effects or critical hazards
Skin contact	No known significant effects or critical hazards
Ingestion	No known significant effects or critical hazards

**INDICATION OF IMMEDIATE MEDICAL
ATTENTION AND SPECIAL TREATMENT
NEEDED, IF NECESSARY**

Notes to physician	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	No specific treatment
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training. See toxicological information (Section 11)

SECTION 5. FIRE-FIGHTING MEASURES
EXTINGUISHING MEDIA

Suitable extinguishing media	Material does not burn. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	None known
Specific hazards arising from the chemical	No specific fire or explosion hazard
Hazardous thermal decomposition products	Decomposition products may include the following materials: metal oxide/oxides
Special protective actions for fire-fighters	No special measures are required.
Special protective equipment for fire-fighters	Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

- For non-emergency personnel** No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Put on appropriate personal protective equipment.
- For emergency responders** If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For nonemergency personnel”.
- Environmental precautions** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

- Spill** Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. If fired powder is released, wear an N-95 dust mask or half-face respirator and polymer gloves and clean up with a shovel, wet mop, or vacuum system. If the powder is mixed with water, dam any drains in the area with absorbent material and clean up using mops, wet vacuums or similar equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

- Protective measures** Put on appropriate personal protective equipment (see Section 8).
- Advice on general occupational hygiene** Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Workers should wash hands and face before eating, drinking, and smoking. See also Section 8 for additional information on hygiene measures.
- Conditions for safe storage, including any incompatibilities** Store in accordance with local regulations. Do not store in unlabeled containers. Any dust generated during handling or processing should be removed by wet mopping or vacuuming.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

Occupational exposure limits

INGREDIENT NAME	Exposure Limits
Zinc oxide	<p>NIOSH REL (United States, 10/2013). CEIL: 15 mg/m³ Form: Dust TWA: 5 mg/m³ 10 hours. Form: Dust and fumes STEL: 10 mg/m³ 15 minutes. Form: Fertilizer and/or industrial use</p> <p>OSHA PEL (United States, 6/2016) TWA: 5 mg/m³ 8 hours. Form: Fertilizer and/or industrial use TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>ACGIH TLV (United States, 3/2016) TWA: 2 mg/m³ 8 hours. Form: Respirable fraction STEL: 10 mg/m³ 15 minutes. Form: Respirable fraction</p>

Appropriate engineering controls

Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

INDIVIDUAL PROTECTION MEASURES

Hygiene measures

Wash hands, forearms, and face thoroughly after handling chemical products, before eating, smoking, and using the lavatory, and at the end of the working period.

Eye/face protection

Recommended: safety glasses or goggles.

SKIN PROTECTION

Hand protection

Wear polymer gloves if prolonged exposure to powder is expected. Use of a barrier cream can reduce potential skin rash due to extremely dry skin.

Body protection

Not required under normal conditions of use

Other skin protection

Not required under normal conditions of use

Respiratory protection

Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**APPEARANCE**

Physical state	Solid [Formed Parts]
Color	White
Odor	None
Odor threshold	Not applicable
pH	Not applicable
Melting point	>1700°C (>3092°F)
Boiling point	>2200°C (>3992°F)
Flash point	Not applicable
Evaporation rate	Not applicable
Flammability (solid, gas)	Material does not burn
Lower and upper explosive (flammable) limits	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Relative density	3.7
Solubility	Insoluble in the following materials: cold water and hot water
Solubility in water	Negligible solubility in water
Partition coefficient: n-octanol/water	Not applicable
Auto-ignition temperature	Not flammable
Decomposition temperature	Not available
Viscosity	Not applicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	No specific data
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials and moisture
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. TOXICOLOGICAL INFORMATION
INFORMATION ON TOXICOLOGICAL EFFECTS

Acute toxicity There is no data available.

Irritation/Corrosion There is no data available.

Sensitization There is no data available.

Mutagenicity There is no data available.

Carcinogenicity

NAME	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Zirconium dioxide	-	-	-	A4	-	-
Aluminium oxide	-	-	-	A4	-	-
Chromium (III) oxide	-	3	-	A4	-	-

Reproductive toxicity There is no data available.

Teratogenicity There is no data available.

Specific target organ toxicity (single exposure) There is no data available.

Specific target organ toxicity (repeated exposure) There is no data available.

Aspiration hazard There is no data available.

Information on the likely routes of exposure Inhalation

POTENTIAL ACUTE HEALTH EFFECTS

Eye contact High dust concentrations from grinding, sanding, or machining formed parts in a way that generates dust may cause mechanical eye irritation.

Inhalation High dust concentrations from grinding, sanding, or machining formed parts in a way that generates dust may cause upper respiratory irritation.

Skin contact Prolonged skin contact with dust may result in dryness. If no dust is generated from fired parts, no acute effects are known.

Ingestion No known significant effects or critical hazards

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS

Eye contact No known significant effects or critical hazards

Inhalation No known significant effects or critical hazards

Skin contact No known significant effects or critical hazards

Ingestion No known significant effects or critical hazards

SECTION 11. TOXICOLOGICAL INFORMATION, CONTINUED

DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE

Short term exposure

Potential immediate effects No known significant effects or critical hazards

Potential delayed effects No known significant effects or critical hazards

Long term exposure

Potential immediate effects No known significant effects or critical hazards

Potential delayed effects No known significant effects or critical hazards

Potential chronic health effects

General No known significant effects or critical hazards

Carcinogenicity No known significant effects or critical hazards

Mutagenicity No known significant effects or critical hazards

Teratogenicity No known significant effects or critical hazards

Developmental effects No known significant effects or critical hazards

Fertility effects No known significant effects or critical hazards

NUMERICAL MEASURES OF TOXICITY

Acute toxicity estimates There is no data available.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY

Ingredient: zinc oxide

RESULT	SPECIES	EXPOSURE
Acute IC50 1.85 mg/L Marine water	Algae - Skeletonema costatum	96 hours
Acute IC50 46 µg/L Fresh water	Algae - Pseudokirchneriella subcapitata - Exponential growth phase	72 hours
Acute LC50 98 µg/L Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
Acute LC50 1.1 ppm Fresh water	Fish - Oncorhynchus mykiss	96 hours

Persistence and degradability There is no data available.

Bioaccumulative potential

PRODUCT/INGREDIENT NAME	LogP _{ow}	BCF	POTENTIAL
Zinc oxide	-	60960	High

MOBILITY IN SOIL

Soil/water partition coefficient (K_{oc}) Not available

Other adverse effects No known significant effects or critical hazards.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

SECTION 14. TRANSPORT INFORMATION

	DOT	IMDG	IATA
UN Number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No	No	No
Additional information	-	-	-

AERG : Not applicable.

Special precautions for user Transport within users' premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

SECTION 15. REGULATORY INFORMATION

U.S. Federal regulations **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 307: Zinc oxide; Chromium (III) oxide

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) Listed

Clean Air Act Section 602 Class I Substances Not listed

Clean Air Act Section 602 Class II Substances Not listed

DEA List I Chemicals (Precursor Chemicals) Not listed

DEA List II Chemicals (Essential Chemicals) Not listed

SECTION 15. REGULATORY INFORMATION, CONTINUED

SARA 302/304 Composition/information on ingredients No products were found.

SARA 304 RQ Not applicable

SARA 311/312 Classification Not applicable

SARA 313

	PRODUCT NAME	CAS NUMBER	%
Form R - reporting requirements	Zinc oxide	1314-13-2	≥5 - ≤10
	Chromium (III) oxide	1308-38-9	≥5 - ≤10
Supplier notification	Zinc oxide	1314-13-2	≥5 - ≤10
	Chromium (III) oxide	1308-38-9	≥5 - ≤10

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

STATE REGULATIONS

Massachusetts The following components are listed: Zirconium dioxide; Aluminium oxide; Zinc oxide; Chromium (III) oxide

New York None of the components are listed.

New Jersey The following components are listed: Aluminium oxide; Zinc oxide; Chromium (III) oxide

Pennsylvania The following components are listed: Aluminium oxide; Zinc oxide; Chromium (III) oxide

California Prop. 65 No products were found.

SECTION 16. OTHER INFORMATION

Procedure used to derive the classification

CLASSIFICATION	JUSTIFICATION
	Not classified.

HISTORY

Date of issue mm/dd/yyyy 02/15/2017

Date of previous issue 04/30/2014

Version 2

Prepared by KMK Regulatory Services Inc.

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