

**SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING**
**1.1 PRODUCT IDENTIFIER**

<b>Product name</b>	Zirconia Ceramic
<b>Product code</b>	Not available
<b>Product description</b>	Not available
<b>Product type</b>	Solid
<b>Other means of identification</b>	YTZP, TTZ, DURA-Z, ZDY, YZ-110, TZ-3Y-E, Cerastat

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

**Identified uses** Not available

**1.3 DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET**

**Supplier's details** CoorsTek, Inc.  
 14143 Denver West Parkway, Suite 400  
 Golden, CO 80401  
 Phone: +1 303 271 7100  
 Fax: +1 303 271 7009  
 Website: www.coorstek.com

**E-mail address of person responsible for this SDS** coorsteksds@coorstek.com

**1.4 EMERGENCY TELEPHONE NUMBER**

**Emergency telephone number (with hours of operation)** +1 303 271 7100  
 8am-5pm MDT (M-F)

**SECTION 2: HAZARDS IDENTIFICATION**
**2.1 CLASSIFICATION OF THE SUBSTANCE OR MIXTURE**

**Product definition** Mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]** Not classified  
 The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended. See Section 11 for more detailed information on health effects and symptoms.

**SECTION 2: HAZARDS IDENTIFICATION CONTINUED**
**2.2 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

**Supplemental label elements** Not applicable

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** Not applicable

**Special packaging requirements**

**Containers to be fitted with child-resistant fastenings** Not applicable

**Tactile warning of danger** Not applicable

**2.3 OTHER HAZARDS**

**Other hazards which do not result in classification** None known

**SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**
**3.2 MIXTURES** Mixture

PRODUCT/INGREDIENT NAME	IDENTIFIERS	%	REGULATION (EC) NO. 1272/2008 [CLP]	TYPE
Zirconium dioxide	EC: 215-227-2 CAS: 1314-23-4	≥90	Not classified	[2]
Yttrium oxide	EC: 215-233-5 CAS: 1314-36-9	≥10 - ≤25	Not classified	[2]
Magnesium oxide	EC: 215-171-9 CAS: 1309-48-4	≥3 - ≤5	Not classified	[2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section. Occupational exposure limits, if available, are listed in Section 8.

**Type**

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII

[4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

[5] Substance of equivalent concern

**SECTION 4: FIRST AID MEASURES**

**4.1 DESCRIPTION OF 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.
- Protection of first-aiders** No action shall be taken involving any personal risk or without suitable training.

**4.2 MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH 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

**4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED**

- Notes to physician** Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** No specific treatment

**SECTION 5: FIREFIGHTING MEASURES**

**5.1 EXTINGUISHING MEDIA**

**Suitable extinguishing media** Material does not burn. Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** None known

**5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE**

**Hazards from the substance or mixture** No specific fire or explosion hazard

**Hazardous combustion products** Decomposition products may include the following materials: metal oxide/oxides

**5.3 ADVICE FOR FIREFIGHTERS**

**Special protective actions for firefighters** No special measures are required

**Special protective equipment for firefighters** Firefighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for firefighters (including helmets, protective boots, and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

**6.1 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 specialised 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 non-emergency personnel”.

**6.2 ENVIRONMENTAL PRECAUTIONS** Avoid dispersal of spilt 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).

**6.3 METHODS AND MATERIAL 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, labelled 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.

**6.4 Reference to other sections** See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

**SECTION 7: HANDLING AND STORAGE**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**7.1 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.

**7.2 CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES** Store in accordance with local regulations. Do not store in unlabelled containers. Any dust generated during handling or processing should be removed by wet mopping or vacuuming.

**7.3 SPECIFIC END USE(S)**

**Recommendations** Not available

**Industrial sector specific solutions** Not available

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

**8.1 CONTROL PARAMETERS**

**Occupational exposure limits**

PRODUCT/INGREDIENT NAME	EXPOSURE LIMIT VALUES
Zirconium dioxide	<b>INSHT (Spain, 1/2017)</b> TWA: 5 mg/m <sup>3</sup> , (as Zr) 8 hours STEL: 10 mg/m <sup>3</sup> , (as Zr) 15 minutes
Yttrium oxide	<b>INSHT (Spain, 1/2017)</b> TWA: 1 mg/m <sup>3</sup> , (as Y) 8 hours
Magnesium oxide	<b>INSHT (Spain, 1/2017)</b> TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Dust and fumes

**Recommended monitoring procedures** If this product contains ingredients with exposure limits, personal, workplace atmosphere, or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

**DNELs/DMELs** No DNELs/DMELs available

**PNECs** No PNECs available

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION CONTINUED**
**8.2 EXPOSURE CONTROLS**

<b>Appropriate engineering controls</b>	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
<b>Individual protection measures</b>	
<b>Hygiene measures</b>	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.
<b>Eye/face protection</b>	Recommended: safety glasses or goggles
<b>Skin protection</b>	
<b>Hand protection</b>	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.
<b>Body protection</b>	Not required under normal conditions of use
<b>Other skin protection</b>	Not required under normal conditions of use
<b>Respiratory protection</b>	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.
<b>Environmental exposure controls</b>	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**
**9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES**
**Appearance**

<b>Physical state</b>	Solid [Formed Parts]
<b>Colour</b>	White
<b>Odour</b>	None
<b>Odour threshold</b>	Not applicable
<b>pH</b>	Not applicable
<b>Melting point/freezing point</b>	>1700°C
<b>Initial boiling point and boiling range</b>	>2200°C
<b>Flash point</b>	Not applicable
<b>Evaporation rate</b>	Not applicable
<b>Flammability (solid, gas)</b>	Material does not burn
<b>Upper/lower flammability or explosive limits</b>	Not applicable

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES CONTINUED**

**Vapour pressure** Not applicable

**Vapour density** Not applicable

**Relative density** 3.7

**Solubility(ies)** Insoluble in the following materials: cold water and hot water

**Partition coefficient: n-octanol/water** Not applicable

**Auto-ignition temperature** Not flammable

**Decomposition temperature** Not available

**Viscosity** Not applicable

**Explosive properties** Not available

**Oxidising properties** Not available

**9.2 OTHER INFORMATION**

**Solubility in water** Negligible solubility in water  
No additional information

**SECTION 10: STABILITY AND REACTIVITY**

**10.1 REACTIVITY** No specific test data related to reactivity available for this product or its ingredients.

**10.2 CHEMICAL STABILITY** The product is stable.

**10.3 POSSIBILITY OF HAZARDOUS REACTIONS** Under normal conditions of storage and use, hazardous reactions will not occur.

**10.4 CONDITIONS TO AVOID** No specific data

**10.5 INCOMPATIBLE MATERIALS** Reactive or incompatible with the following materials: oxidising materials

**10.6 HAZARDOUS DECOMPOSITION PRODUCTS** Under normal conditions of storage and use, hazardous decomposition products should not be produced.

**SECTION 11: TOXICOLOGICAL INFORMATION**

**11.1 INFORMATION ON TOXICOLOGICAL EFFECTS**

**Acute toxicity** There is no data available.

**Irritation/Corrosion** There is no data available.

**Sensitisation** There is no data available.

**Mutagenicity** There is no data available.

**Carcinogenicity** There is no data available.

**Reproductive toxicity** There is no data available.

**SECTION 11: TOXICOLOGICAL INFORMATION CONTINUED**

**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 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

**DELAYED AND IMMEDIATE EFFECTS AS WELL AS 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

**Other information** Not available



**SECTION 12: ECOLOGICAL INFORMATION**

**12.1 TOXICITY** There is no data available.

**12.2 PERSISTENCE AND DEGRADABILITY** There is no data available.

**12.3 BIOACCUMULATIVE POTENTIAL** There is no data available.

**12.4 MOBILITY IN SOIL**

**Soil/water partition coefficient (K<sub>oc</sub>)** Not available

**Mobility** Not available

**12.5 RESULTS OF PBT AND VPVB ASSESSMENT**

**PBT** Not applicable

**vPvB** Not applicable

**12.6 OTHER ADVERSE EFFECTS** No known significant effects or critical hazards.

**SECTION 13: DISPOSAL CONSIDERATIONS**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**13.1 WASTE TREATMENT METHODS**

**Product**

**Methods of disposal** The generation of waste should be avoided or minimised 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.

**Hazardous waste** Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 2008/98/EC.

**Packaging**

**Methods of disposal** The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Special precautions** 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 spilt material and runoff and contact with soil, waterways, drains, and sewers.

**SECTION 14: TRANSPORT INFORMATION**

	ADR/RID	ADN	IMDG	IATA
14.1 UN number	Not regulated	Not regulated	Not regulated	Not regulated
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No	No	No	No
Additional information	-	-	-	-

**14.6 SPECIAL PRECAUTIONS FOR USER** Transport within user's 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**
**15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE**
**EU Regulation (EC) No. 1907/2006 (REACH)**
**Annex XIV - List of substances subject to authorisation**

**Annex XIV** None of the components are listed.

**Substances of very high concern** None of the components are listed.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** Not applicable

**Other EU regulations**

**Europe inventory** All components are listed or exempted

**Ozone depleting substances (1005/2009/EU)** Not listed

**Prior Informed Consent (PIC) (649/2012/EU)** Not listed

**Seveso Directive** This product is not controlled under the Seveso Directive.

**15.2 CHEMICAL SAFETY ASSESSMENT** This product contains substances for which Chemical Safety Assessments are still required.

**SECTION 16: OTHER INFORMATION**

**Abbreviations and acronyms** ATE = Acute Toxicity Estimate  
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]  
 DMEL = Derived Minimal Effect Level  
 DNEL = Derived No Effect Level  
 EUH statement = CLP-specific Hazard statement  
 PBT = Persistent, Bioaccumulative and Toxic  
 PNEC = Predicted No Effect Concentration  
 RRN = REACH Registration Number  
 vPvB = Very Persistent and Very Bioaccumulative

**PROCEDURE USED TO DERIVE THE CLASSIFICATION ACCORDING TO REGULATION (EC) NO. 1272/2008 [CLP/GHS]**

CLASSIFICATION	JUSTIFICATION
Not classified	-

**Full text of abbreviated H statements** Not applicable

**Full text of classifications [CLP/GHS]** Not applicable

**HISTORY**

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**Version** 2

**Prepared by** KMK Regulatory Services Inc.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.