

CoorsTek, Inc.
MATERIAL SAFETY DATA SHEET

CoorsTek, 16000 North Table Mountain Parkway Golden, Colorado 80401	EMERGENCY TELEPHONE NO: (303) 278-4000		
TRADE NAME: Alumina - Zirconia Ceramic	MSDS NUMBER: 21	DATE OF ISSUE: January 14, 1998	
CHEMICAL NAME: Sintered Alumina - Zirconia Ceramic	SYNONYMS: AZ-25 - All		
PREPARED BY: CoorsTek	REVISION: Original	REVISION DATE: NA	DATE OF REVIEW: January 14, 1998

1. INGREDIENTS

MATERIAL	PERCENT	ACGIH (TLV)	OSHA (PEL)
1. Aluminum Oxide (CAS # 1344-28-1)	> 60	10 mg/m ³ (TWA)	15 mg/m ³ (T) 5 mg/m ³ (R)
2. Zirconium Oxide (CAS # 1314-23-4)	< 26	5 mg/m ³ (TWA) 10 mg/m ³ (STEL) as Zr	5 mg/m ³ (T) as Zr
3. Amorphous Phase (see comment 1, section 11)	< 9	Not Established	Not Established

All values are Time Weighted Average (TWA), unless noted
 STEL = Short Term Exposure Limit
 T = Total Particulate Matter (TWA)
 R = Respirable Fraction of Particulate Matter (TWA)

2. PHYSICAL DATA

APPEARANCE: White / Off-white, or Pink Inert Solid	ODOR: None	MELTING POINT: 5000 ° F	SPECIFIC GRAVITY: Approximately 3.85
VAPOR DENSITY (AIR = 1): NA	% VOLATILE BY VOLUME: 0	BULK DENSITY: NAIF	BOILING POINT: NA
VAPOR PRESSURE: NA	% SOLUBILITY (H ₂ O): Negligible	EVAPORATION RATE (BuOAC = 1): NAIF	OTHER:

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD: NA
FLAMMABLE LIMITS LEL: NA UEL: NA
EXTINGUISHING MEDIA: Will not burn. Select media which is appropriate for fighting surrounding fire.
SPECIAL FIRE-FIGHTING PROCEDURES: Use NIOSH approved self-contained breathing apparatus with full face piece operated in pressure demand or other positive pressure mode. Wear full fighting protective clothing.
UNUSUAL FIRE AND EXPLOSION HAZARDS Not an explosion hazard

4. HEALTH HAZARD DATA

LD50 ORAL (INGESTION) NAIF	LD50 DERMAL (SKIN CONTACT) NAIF	LD50 (INHALATION) NAIF
PRIMARY ROUTE OF EXPOSURE Inhalation		
EFFECTS OF OVEREXPOSURE: FIRED OR SINTERED SOLID MATERIAL HAS NO KNOWN HEALTH HAZARD.		
ACUTE: High dust concentrations may cause mechanical eye irritation and upper respiratory irritation. Prolonged skin contact with dust may result in dryness.		
CHRONIC: Chronic exposure to dusts may cause pneumoconiosis.		
There are no known medical conditions aggravated by exposure to this product.		

5. EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Move to area free from risk of further exposure. Administer oxygen or artificial respiration, as needed. Get medical attention.
Eye Contact: Flush with tepid water for at least 15 minutes while holding eyelids open. Seek medical attention if irritation develops.
Skin Contact: Wash affected areas with soap and water. Seek medical attention if irritation develops.
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.

6. PHYSICAL HAZARDS

None known.

7. SPECIAL PROTECTION INFORMATION

VENTILATION:

If dust is generated during processing or use, local exhaust should be provided to maintain exposures below the limits cited in Section 1. Design details for local exhaust ventilation systems may be found in the latest edition of "Industrial Ventilation: A Manual of Recommended Practices" published by ACGIH Committee on Industrial Ventilation, PO Box 16153, Lansing, MI 48910. The need for local exhaust ventilation should be evaluated by a professional industrial hygienist. Local Exhaust systems should be designed by a professional engineer.

RESPIRATORY:

If airborne concentrations may exceed the exposure limits outlined in Section 1, use a NIOSH/MSHA approved respirator for dusts and mists with an exposure limit of not less than 0.05 mg/M³. If exposures exceed 10 times the recommended limits, consult a professional industrial hygienist, or your respiratory equipment supplier, about the selection of the proper equipment. The evaluation of the need for respiratory protection should be determined by a professional industrial hygienist.

EYE PROTECTION:

Safety glasses are recommended.

PROTECTIVE GLOVES:

Wear any polymer gloves if prolonged exposure to powder is expected.

ALL CHEMICALS SHOULD BE HANDLED SO AS TO PREVENT EYE CONTACT AND EXCESSIVE OR REPEATED SKIN CONTACT. APPROPRIATE EYE AND SKIN PROTECTION SHOULD BE EMPLOYED. INHALATION OF DUSTS AND VAPORS SHOULD BE AVOIDED.

8. CHEMICAL REACTIVITY

CONDITIONS CAUSING INSTABILITY:

Stable. None known.

INCOMPATIBILITY (MATERIALS TO AVOID):

None known.

HAZARDOUS DECOMPOSITION PRODUCTS:

May include oxides of zirconium and aluminum at extremely high temperatures.

SPECIAL SENSITIVITY:

None known.

9. STORAGE INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING:

Store in a cool, dry area. Any dust generated during handling or processing should be removed by wet mopping or vacuuming. Avoid breathing dusts.

10. SPILL, LEAK, AND DISPOSAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED:

Secure area and obtain necessary personal protective equipment. Scoop up material and place in appropriate containers for reuse or disposal. Do not allow material to enter sewer or waterways. Small amounts may be cleaned up by wet mopping or vacuuming.

EPA RCRA ID NUMBER:

NA

WASTE DISPOSAL METHOD:

This material, if discarded, is not defined as hazardous under 40 CFR 261. Disposal in a landfill in accordance with applicable federal, state, and local laws or regulations is recommended.

11. ADDITIONAL COMMENTS

1. Amorphous phase is composed of silicon dioxide, aluminum oxide, and magnesium oxide
2. This product contains the following ingredients which are listed as Special Health Hazard Substances by the State of New Jersey: None
3. This product contains the following ingredients which are listed as hazardous substances under the State of New Jersey Right-To-Know legislation: Aluminum Oxide.
4. This product contains the following ingredients which are listed as Special Hazardous Substances by the Commonwealth of Pennsylvania: None.
5. This product contains the following ingredients which are listed as Extraordinarily Hazardous Substances by the Commonwealth of Massachusetts: None
6. This product contains the following ingredients listed under Proposition 65 of the State of California: None
7. This product contains the following ingredients listed on the Toxic Substances Control Act Chemical Inventory List: Aluminum oxide, zirconium oxide, silicon dioxide, and magnesium oxide.
8. Pursuant to Section 313, SARA Title III, this product contains the following reportable substances: None
9. OSHA Hazard Communication Categories: Irritant, Eye Hazard, Lung Hazard.
10. SARA: Fire - No; Pressure - No; Reactive - No; Acute - Yes; Chronic - Yes.
11. No DOT labels are required, no DOT Hazard ID Number has been assigned, and no DOT shipping restrictions apply.
12. Judgments as to the suitability of the information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, CoorsTek extends no warranties, makes no representations, and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Not Est. = Not Established
NAIF = No Applicable Information Found
NA = Not Applicable