

SECTION 1. IDENTIFICATION

GHS product identifier Alumina Ceramic

Chemical name Fired or Sintered Ceramic Formed Parts

Other means of identification ADO-85, ADO-90, ADO-96, APO-94, APOLX-94, ADOS-90-R

RECOMMENDED USE AND RESTRICTIONS

Identified uses Not available

Supplier's details CoorsTek, Inc.
16000 Table Mountain Parkway Golden, CO 80403
Phone: +1 303 271 7000
Fax: +1 303 271 7009

Emergency telephone number +1 303 271 7000
(with hours of operation) 7:00 AM - 4:00 PM MST

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

General Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

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 Ceramic Formed Parts

Other means of identification ADO-85, ADO-90, ADO-96, APO-94, APOLX-94, ADOS-90-R

CAS NUMBER/OTHER IDENTIFIERS

CAS number Not applicable

Product code Not available

Ingredient name	%	CAS Number
Aluminium oxide	60 - 100	1344-28-1
Silicon dioxide (amorphous)	5 - 10	7631-86-9
Manganese dioxide	1 - 5	1313-13-9
Diiron trioxide	0.1 - 1.0	1309-37-1

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. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Skin contact Wash contact areas with soap and 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 Fire-fighters 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 &
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 non-emergency 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 & 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 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
Manganese dioxide	NIOSH REL (United States, 6/2009). STEL: 3 mg/m ³ , (Mn) 15 minutes. Form: Fume TWA: 1 mg/m ³ , (Mn) 10 hours. Form: Fume ACGIH TLV (United States, 3/2012). TWA: 0.2 mg/m ³ , (Mn) 8 hours. OSHA PEL (United States, 6/2010). CEIL: 5 mg/m ³ , (as Mn)
Particulates Not Otherwise Regulated	OSHA PEL (United States). TWA: 5 mg/m ³ Form: Respirable dust TWA: 10 mg/m ³ Form: Total dust ACGIH TLV (United States). TWA: 3 mg/m ³ Form: Respirable.

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

SECTION 8. EXPOSURE CONTROLS CONTINUED
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** Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES
APPEARANCE

- Physical state** Solid [Formed Parts]
- Color** Not available
- 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
- Burning time** Not applicable
- Burning rate** 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

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES CONTINUED

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

SADT Not applicable

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 None known

Hazardous decomposition products Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity There is no data available

IRRITATION/CORROSION

Skin There is no data available

Eyes There is no data available

Respiratory There is no data available

SECTION 11. TOXICOLOGICAL INFORMATION CONTINUED

SENSITIZATION

Skin There is no data available.

Respiratory There is no data available.

OTHER

Mutagenicity There is no data available.

Carcinogenicity There is no data available.

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 Routes of entry anticipated: 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 Chronic exposure to dusts may cause pneumoconiosis.

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

Route	ATE value
Oral	117104.4 mg/kg

SECTION 12. ECOLOGICAL INFORMATION

Toxicity There is no data available.

Persistence and degradability There is no data available.

Bioaccumulative potential There is no data available.

MOBILITY IN SOIL

Soil/water partition coefficient (K_{oc}) There is no data 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. 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	-	-	-

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.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available

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 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

SARA 302/304

Composition/information on ingredients No products were found.

SARA 304 RQ Not applicable

SARA 311/312 Not applicable

Composition/information on ingredients No products were found.

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	Aluminum oxide	1344-28-1	60 - 100
	Manganese dioxide	1313-13-9	1 - 5
Supplier notification	Aluminum oxide	1344-28-1	60 - 100
	Manganese dioxide	1313-13-9	1 - 5

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: Aluminium oxide; Silicon dioxide; Diiron trioxide

New York None of the components are listed.

New Jersey The following components are listed: Aluminium oxide; Diiron trioxide

Pennsylvania The following components are listed: Aluminium oxide; Silicon dioxide; Manganese dioxide; Diiron trioxide

SECTION 15. REGULATORY INFORMATION CONTINUED

CALIFORNIA PROP. 65 No products were found.

INTERNATIONAL REGULATIONS
International lists

Australia inventory (AICS): All components are listed or exempted.

China inventory (IECSC): All components are listed or exempted.

Japan inventory: All components are listed or exempted.

Korea inventory: All components are listed or exempted.

Malaysia Inventory (EHS Register): All components are listed or exempted.

New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.

Philippines inventory (PICCS): All components are listed or exempted.

Taiwan inventory (CSNN): Not determined.

**Chemical Weapons Convention List
Schedule I Chemicals** Not listed

**Chemical Weapons Convention List
Schedule II Chemicals** Not listed

**Chemical Weapons Convention List
Schedule III Chemicals** Not listed

SECTION 16. OTHER INFORMATION
**Hazardous Material
Information System (U.S.A.)**

Health: 2* Flammability: 0 Physical hazards: 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

**National Fire Protection
Association (U.S.A.)**

Health: 2 Flammability: 0 Instability: 0

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SECTION 16. OTHER INFORMATION CONTINUED
HISTORY

Date of issue mm/dd/yyyy 05/15/2014

Version 1

Revised Section(s) Not applicable

Prepared by KMK Regulatory Services Inc.

Key to abbreviations ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships,
 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 UN = United Nations

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