CoorsTek
Amazing Solutions.

ORIGINAL DATE: 01/24/1991
REVISION DATE: 08/04/1999

SECTION I: MATERIAL IDENTIFICATION

MATERIAL NAME (TRADE NAME):	Alumina Ceramic - Sintered
DESCRIPTION:	Sintered Aluminum Oxide ADOS-90-R, ADS-96-R, ADS-995-R, AHP-99-R, AD-96-RC, AD-96-IWB, AD-96-A6, AD-96-AWB, Ixion 771, AD-90-S2, Virgin and Reclaim.
OTHER DESIGNATION:	Fired Alumina Ceramic CAS # 1344-28-1
MANUFACTURER:	CoorsTek 2449 River Road Grand Junction, CO 81505

SECTION II: INGREDIENTS AND HAZARDS

		PERCENT
Al_2O_3 (Aluminum Oxide)	>	90.0
SiO_2 Total (Silicon Dioxide)	<	5.0
SiO_2 Free (Silicon Dioxide)	<	1.0
TiO_2 (Titanium Dioxide)	<	2.0
Fe_2O_3 (Iron III Oxide)	<	2.0
MnO_2 (Manganese Dioxide)	<	3.0
MgO (Magnesium Oxide)	<	1.0
CaO (Calcium Oxide)	<	1.0

The primary phase of the sintered ceramic is alpha alumina with small amount of glass phase. SiO_2, TiO_2, Fe_2O_3, MnO_2, MgO, and CaO may combine with Al_2O_3 to form solid solutions or spinel phases.

SECTION III: PHYSICAL DATA

Boiling point	ND
Specific gravity (g/cc)	3.35 minimum
Water solubility	Negligible
Melting point	ND

Appearance & Odor: A white or black inert solid; no odor.

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SECTION IV: FIRE AND EXPLOSION HAZARD

FLASH POINT & METHOD	AUTOIGNITION TEMPERATURE	FLAMMABILITY LIMITS IN AIR	LOWER	UPPER
Non-flammable	NA	NA	-	-

Extinguishing media and procedures: Use extinguishing aids appropriate to surrounding media. For dust, fire fighters should use self-contained breathing equipment and eye protection.

SECTION V: REACTIVITY DATA

This is a stable material.

SECTION VI: HEALTH HAZARD INFORMATION

EXPOSURE LIMITS:	ACGIH (TLV)		OSHA (PEL)	
	TWA	STEL	TWA	STEL
Aluminum oxide (total dust)	10 mg/m³	ND	10 mg/m³	ND
Respirable dust	ND	ND	5 mg/m³	ND

Fired or sintered ceramic alumina has no known health hazards in solid state. If in air borne form, avoid breathing dust and keep dust out of eyes. This is a non-toxic material with a free silica (quartz) content of less than 1.0% and TLV of a nuisance particulate.

First Aid Eye contact: Wash eyes thoroughly with plenty of water to remove dust particles. Get medical help if irritation persists.

SUSPECT ANIMAL CARCINOGEN	SUSPECT HUMAN CARCINOGEN	MUTAGEN	TERATOGEN
NO	NO	NO	NO

Regulated as carcinogen by: IARC: NO; OSHA: NO; NTP: NO; OTHER: NO.

SECTION VII: SPILL, LEAK AND DISPOSAL

Collect in a convenient manner which will avoid dusting conditions. Dispose of this material as an inert solid in a landfill. No special precautions are necessary according to the manufacturer. Follow Federal, State and local regulations for disposal.

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SECTION VIII: SPECIAL PROTECTION INFORMATION

When in non-airborne state, no special protection is necessary. When airborne, use general and local exhaust ventilation to keep dust levels within the TLV limits in the air of the work place.

Under heavy dusting conditions, use an approved dust respirator. Use goggles or other suitable eye protection to keep particles out of the eyes. Under dusting conditions, the presence of other materials in the air that could be adsorbed on alumina particles and carried into the respiratory tract needs to be considered.

SECTION IX: SPECIAL PRECAUTIONS AND COMMENTS

Store in closed containers (or bags) which are protected from physical damage. Follow good housekeeping practices where this material is handled or stored. Preplacement and periodic medical examinations should be used to evaluate lung function of workers exposed regularly to this material in the airborne form.

SECTION X: ENVIRONMENTAL/SAFETY REGULATIONS

Section 313 (Title III Superfund Amendment and Reauthorization Act)

This product does not contain any chemical 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.

DATA SOURCE(S) CODE 1, 2, 12, 14, 16, 1000A

Judgments as to the suitability of the information herein for purchaser's purposed are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Coors Ceramics Company extends no warranties, makes no representations and assume no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

NA: Not Applicable ND: Not Determined

Prepared by:
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MATERIAL SAFETY DATA SHEET

CoorsTek, 600 Ninth Street, Golden, Colorado 80401	EMERGENCY TELEPHONE NO: (303) 278-4000		
TRADE NAME: Alumina Ceramic	MSDS NUMBER: 01		DATE OF ISSUE: June 9, 1992
CHEMICAL NAME: Sintered Alumina Ceramic	SYNONYMS: AD-85; AD-90; AD-94; AD-96; AD-98; AD-995; AD-998; ADO-90; ADO-96; ADR-96; AHP-99; AP-All; APO-94; APOLX-94; FG-995		
PREPARED BY: CoorsTek, Inc.	REVISION: 04	REVISION DATE: January 2004	REVIEWED BY: Environmental, Health and Safety

1. INGREDIENTS

MATERIAL	PERCENT	ACGIH (TLV)	OSHA (PEL)
1. Aluminum Oxide (CAS #1344-28-1)	> 85	10 mg/m^3 (T)	10 mg/m^3 (T) 5 mg/ m^3 (R) (as Al)
2. Amorphous Phase (See Comment 1, Section II)	< 15	Not Established	Not Established
All values are Time-Weighted Averages T = Total Particulate Matter R = Respirable Fraction of Particulate Matter			

2. PHYSICAL DATA

APPEARANCE: White or dark brown inert solid	ODOR: None	MELTING POINT: 3700°F	SPECIFIC GRAVITY: Approximately 3.7
VAPOR DENSITY (AIR = 1): NA	% VOLATILE BY VOLUME: 0	BULK DENSITY: NAIF	BOILING POINT: 4000°F
VAPOR PRESSURE: NA	% SOLUBILITY (H_2O): Negligible	EVAPORATION RATE (BuOAC = 1): NAIF	OTHER: NAIF

3. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD:
NA

FLAMMABLE LIMITS

LEL: NA UEL: NA

EXTINGUISHING MEDIA:
Will not burn. Select media that 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 fire-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 the latest edition of "Industrial Ventilation: A Manual of Recommended Practices" published by ACGIH Committee on Industrial Ventilation, P.O. 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/M^3. 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. PROPER PERSONAL PROTECTVIE EQUIPMENT SELECTION SHOULD FOLLOW THE RECOMMENDATIONS PROVIDED IN THE HAZARD ANALYSIS DONE FOR THE TASK INVOLVED, OR AS DETERMINED BY A PROFESSIONAL INDUSTRIAL HYGIENIST.

8. CHEMICAL REACTIVITY

CONDITIONS CAUSING INSTABILITY:
Stable. None known.

INCOMPATIBILITY (MATERIALS TO AVOID):
None known.

HAZARDOUS DECOMPOSITION PRODUCTS:
May include oxides of aluminum at 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. Wet mopping or vacuuming may clean up small amounts.

EPA RCRA ID NUMBER:
N/A

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 as a CAL-OSHA Workplace Airborne Contaminant: Aluminum Oxide
8. This product contains the following ingredients listed on the Illinois Toxic Substances Disclosure to Employees List: Aluminum Oxide
9. This product contains the following ingredients listed on the Pennsylvania Right-to-Know List of Hazardous Substances: Aluminum Oxide (regulated under a synonym)
10. This product contains the following ingredients regulated as a Texas Air Contaminant with the Health Effects Screening Level: Aluminum Oxide (regulated under a synonym)
11. This product contains the following ingredients listed on the Toxic Substances Control Act Chemical Inventory List: Aluminum Oxide, Silicon Dioxide, and Magnesium Oxide.
12. Pursuant to Section 313, SARA Title III, this product contains the following reportable substances: None
13. OSHA Hazard Communication Categories: Irritant, Eye Hazard, and Lung Hazard.
14. SARA: Fire - No; Pressure - No; Reactive - No; Acute - Yes; Chronic - Yes.
15. No DOT labels are required, no DOT Hazard I.D. Number has been assigned, and no DOT shipping restrictions apply.
16. Judgements 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 if 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.