



INDUSTRIES 3R

MATERIAL SAFETY DATA SHEET

IDENTITY

Part Number: **RS-501**
 Identity: Refractory Sheet
 Description: Reinforced Alumina Matrix Composite

SUPPLIER

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COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT	# CAS	FORMULA	MOLECULAR WEIGHT	% by Weight
Aluminum Oxide	1344-28-1	Al ₂ O ₃	101.96128	
Silica (amorphous)	60676-86-0	SiO ₂	60.08	
Calcium Oxide	1305-78-8	CaO	56.08	
Boron Oxide	1303-86-0	B ₂ O ₃	69.62	
Magnesium Oxide	1309-48-4	MgO	40.31	
Al ₂ O ₃				70 – 82
SiO ₂				12 – 18
CaO				6 – 7

EXPOSURE GUIDELINES: Aluminum Oxide

OSHA PEL as 8 hr TWA: 15/5 mg/m³ Total dust/Respirable Fraction
 ACGIH PEL as 8 hr TWA: 10 mg/m³ Inhalable particulate with no asbestos and <1% crystalline silica
 Canadian PEL as TWA: 5 mg/m³
 Carcinogenicity by ACGIH: Group A4, Not classifiable as a human carcinogen

EXPOSURE GUIDELINES: Silica (amorphous)

OSHA PEL as 8 hr TWA: 20 mppcfa, 80 mg/m³
 NIOSH PEL as 8 hr TWA: 6 mg/m³
 Canadian PEL as TWA : 5/2 mg/m³ Total mass/Respirable Mass
 ILDH Level by SCPC: 3000 mg/m³
 Carcinogenicity by ACGIH: Group 3

EXPOSURE GUIDELINES: Calcium Oxide

OSHA PEL as 8 hr TWA: 5 mg/m³
 ACGIH PEL as 8 hr TWA: 2 mg/m³

EXPOSURE GUIDELINES: Boron Oxide

OSHA PEL as 8 hr TWA: 15/5 mg/m³ Total Dust/Respirable Fraction
 ACGIH TWA: 10 mg/m³

EXPOSURE GUIDELINES: Magnesium Oxide

OSHA PEL as 8 hr TWA: 15 mg/m³
 ACGIH PEL as 8 hr TWA: 15 mg/m³

PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Rigid shapes
Appearance:	White to tan
Odor:	Odorless
Solubility in H ₂ O:	Insoluble
S.G. (g/cc):	2.1
Melting Point:	> 1500°C (2732°F)
Vapor Pressure:	N/A
% Volatile:	0
pH:	N/A

FIRE-FIGHTING MEASURES

Material are not combustible.

STABILITY AND REACTIVITY

Stability: Material is stable.

Chemical Incompatibilities: Powerful oxidizers; fluorine, chlorine trifluoride, manganese trioxide, oxygen difluoride, etc.

Hazardous Decomposition products: None.

EXPOSURE CONTROLS

Engineering Controls: Use dust suppression controls. Local exhaust ventilation, point of generation dust collection, and/or down-draft work stations to minimize airborne dust generation are recommended when machining product.

Respiratory protection: Use appropriate protection pursuant to OSHA 29CFR 1910.134 and 29CFR 1926.103. The following information is provided as a guide and reflects industry recommendations for control of dust.

PPE Other: Work clothes should be washed separately and the washing machine rinsed following use. If possible, do not take work clothes home following machining or removal activities that produce significant amounts of dust.

Skin protection: Wear gloves, head coverings, and full body clothing to prevent skin irritation. Disposable clothing may be used. Store work clothes and street clothes separately.

Eye protection: Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses without goggles. Do not get dust or liquids into eyes. Have eye washing facilities available when using products.

These products are generally not hazardous during normal use. These guidelines are provided for special circumstances involved in machining , use and or after service removals. See *section Handling and Storage* for after service and *section Disposal Information* for disposal recommendations.

DISPOSAL CONSIDERATIONS

Disposal: Consult with local, state and federal regulations. In most cases these materials may be landfilled safely.

Hazardous Waste Classification: Not listed as a RCRA Hazardous waste (40 CFR 261.31). Not listed under SARA, CERCLA, or the Clean Air Act.

Empty Containers: Empty containers may contain product dust or residue. Do not re-use.

Disposal regulations vary. Consult with all applicable regulations prior to disposal.

HAZARDS IDENTIFICATION

TARGET ORGANS: Skin, eyes, and lungs.

Emergency Overview

CAUTION: Handling or machining of these products may produce respirable dust particles. Dust may irritate eyes, skin respiratory tract.

Inhalation: Dust may cause irritation or soreness of throat and nose.

Skin Contact: May cause temporary dryness, irritation or rash.

Eye Contact: Dust may cause temporary irritation or inflammation.

Ingestion: Ingestion is unlikely. May cause gastrointestinal disturbances. Never induce vomiting without the advice of a physician.

Medical Conditions Aggravated by Exposure: Respiratory effects may be aggravated by smoking. Pre-existing respiratory problems may be aggravated by dust.

FIRST AID MEASURES

Inhalation: Remove to fresh air. Rinse mouth to clear throat and expel liquid. Blow nose to evacuate dust. Consult a physician if irritation persists.

Eye Contact: Do not rub eyes. Keep hands or contaminated body parts away from eyes. Remove contact lenses. Flush with water. If irritation persists, consult a physician.

Skin Contact: Wash with soap and water. For dryness, a skin cream may be helpful. Do not apply anything to a rash. Consult a physician if irritation persists.

Ingestion: Do not induce vomiting without advice of a physician. Seek medical attention.

Note to Physicians: Aluminum Oxide dusts have caused no systemic or pathological problems. The material is inert in the body. Some individuals may experience allergic sensitivity reactions. These are generally limited to mild occupational dermatitis. Chronic inhalation may result in pleural plaques not associated with cancers. Other effects principally derived from physical abrasion.

These products contain a small percentage of amorphous silica, however, not in sufficient quantity to produce free crystalline silica upon heating. Dusts are therefore considered of the inert (nuisance) type and would not be expected to cause permanent damage to tissues on inhalation unless the exposure is severe. Chronic exposure may produce radioplaque deposits in the pulmonary system with little or no parenchymal reactions. Some individuals may exhibit allergenic reactions ranging from asthmatic symptoms to benign pneumoconiosis.

ACCIDENTAL RELEASE MEASURES

Spill Procedures: Clean up procedures should minimize formation of airborne dusts. Remove dust by vacuuming using HEPA filtration where possible. Liquid and moist products (groups 3, 4 & 5) should be cleaned up with sponge, mop or cloth.

Release into Air: Prevent release of airborne particulates where possible. Not a regulated hazardous substance. See *section Exposure Controls* for appropriate engineering controls.

Release into Water: Release into water is not appropriate. Not a regulated hazardous substance. Landfill dusts and debris consistent with local regulations.

HANDLING AND STORAGE

Storage: These materials are stable and may be stored indefinitely. Physical abrasion may produce small amounts of respirable dusts. Liquid and moist products (groups 3, 4 & 5) should be stored in a sealed container. See precautions under *section Exposure Controls*.

Normal Use: Materials are stable under normal use and are not expected to produce significant hazardous by-products or emissions.

Machining and Cutting: These materials may produce respirable and nuisance dusts when machined or cut. See *section Exposure Controls* for exposure controls and personal protection during machining or installation procedures.

High Temperature Conditions: Service significantly above the product design temperature may increase friability and the possibility of generating airborne fibers or particulates. While not considered problematic during use, airborne fibers may complicate removal activities. It is recommended that product use be carefully matched to design parameters.

After Service: AS MANUFACTURED THIS PRODUCT IS AN ALUMINOSILICATE WHICH MAY TRANSFORM UPON HEATING (TEMPERATURES GREATER THAN 1000°C FOR EXTENDED PERIODS OF TIME) TO NON-HAZARDOUS MULLITE AND CRISTOBALITE (CAS # 14464-46-1), A FORM OF CRYSTALLINE SILICA. REMOVAL OF THIS PRODUCT AFTER USE MAY GENERATE DUSTS. PROLONGED OR REPEATED INHALATION OF RESPIRABLE FREE CRYSTALLINE SILICA DUST MAY CAUSE DELAYED LUNG INJURY (SILICOSIS). THE IARC HAS CLASSIFIED CRYSTALLINE SILICA AS GROUP 2A, PROBABLE HUMAN CARCINOGEN. THERE IS SUFFICIENT EVIDENCE OF CARCINOGENICITY IN ANIMALS, BUT LIMITED EVIDENCE IN HUMANS. OSHA'S FINAL RULE LIMIT AND ACGIH'S TLV FOR RESPIRABLE CRISTOBALITE IS 0.05 mg/m³. APPROPRIATE VENTILATION AND RESPIRATORY PROTECTION SHOULD BE PROVIDED IN COMPLIANCE WITH OSHA STANDARDS. STRICT ADHERENCE TO RECOMMENDED SAFE WORK PRACTICES IS ADVISED. PRODUCT REMOVAL MUST CONSIDER THE POSSIBILITY OF USAGE ABOVE DESIGN TEMPERATURES.

Product removal must consider the possibility of usage above design temperatures. See *section Exposure Controls* for appropriate respiratory protection during removal.

TRANSPORTATION INFORMATION

Not regulated hazardous substances, no specific regulations apply.

TOXICOLOGY / ECOLOGICAL INFORMATION

Epidemiology: N/A

Toxicology: N/A

Ecotoxicological Information: No information available.

Distribution: Aluminum oxide and silica are naturally occurring and are widely distributed in igneous rock. Secondary deposits in sedimentary rock may be found.

Chemical Fate Information: The relative inertness of this material indicate that it may be highly persistent in the environment. No information regarding any negative effects of this persistence has been noted.

REGULATORY INFORMATION

SARA Section 313 Supplier Notification: These products do not contain toxic chemicals subject to the reporting requirements of the superfund and reauthorization act of 1986 section 313 (40 CFR 372).

WHMIS Status: Aluminum oxide (CAS no. 1344-28-1), Silica (amorphous) (CAS no.60676-86-0), and Calcium oxide (CAS no. 1305-78-8) are subject to disclosure under the Hazardous Products. Act.

New Jersey Right to Know Note: Aluminum oxide (CAS no. 1344-28-1) and Silica (amorphous) (CAS no.60676-86-0), are found on the New Jersey Hazardous Substance list and are subject to reporting under SARA and the New Jersey Worker and Community Right to Know Act.

OTHER

The information contained herein is based on data considered to be accurate as of the preparation or revision date. It is provided in good faith and in compliance with state and federal regulations. No warranty or representation, express or implied is made as to the accuracy or completeness of this information. Other national, state and/or local regulations may apply.