



## SAFETY DATA SHEET

### 1. Identification

Product identifier	Alumina-Graphite Shapes
Recommended use	For Industrial Use Only
Recommended restrictions	Users should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.

### Manufacturer/Supplier information

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### 2. Hazard(s) identification

Physical hazards	Not classified	
Health hazards	Carcinogenicity	Category 1A
Environmental hazards	Not classified	
OSHA defined hazards	Not classified	

### Label elements



Signal word	Danger
Hazard Statement	May cause cancer.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection.
Response	If concerned: Get medical advice/attention.

<p><b>Storage</b></p> <p><b>Disposal</b></p> <p><b>Hazard(s) not otherwise Classified (HNOC)</b></p> <p><b>Supplemental information</b></p>	<p>Store locked up.</p> <p>Dispose of contents/container in accordance with local/regional/national/international regulations</p> <p>None Known.</p> <p>Users should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Overexposure to the respirable dust of crystalline silica (quartz or cristobalite, less than or equal to 5 microns in size) may lead to silicosis in humans, which is a progressive and irreversible lung disease. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.</p>
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### 3. Composition/information on ingredients

Chemical Name	Common Name/Synonyms	CAS Number	%
Aluminum Oxide (Non-Fibrous)		1344-28-1	*
Phenol		108-95-2	*
Iron Oxide		1309-37-1	*
Formaldehyde		50-00-0	*
Silica	Quartz	14808-60-7	*
Zirconium Dioxide	Zircon	1314-23-3	*

\*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

### 4. First-aid measures

<p><b>Inhalation</b></p> <p><b>Skin contact</b></p> <p><b>Eye contact</b></p> <p><b>Ingestion</b></p> <p><b>Most important symptoms/effects, acute and delayed</b></p> <p><b>Indication of immediate medical attention and special treatment needed</b></p> <p><b>General information</b></p>	<p>Move to fresh air. Call a physician if symptoms develop or persist.</p> <p>Wash off with soap and water. Get medical attention if irritation develops and persists.</p> <p>Do not rub your eyes. Rinse with water. Get medical attention if irritation develops and persists.</p> <p>Rinse mouth. Get medical attention if symptoms occur.</p> <p>Dust may irritate the respiratory tract, skin, and eyes. Coughing.</p> <p>Provide general supportive measures and treat symptomatically. Keep the victim under observation. Symptoms may be delayed.</p> <p>If concerned: Get medical advice. Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.</p>
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## 5. Fire-fighting measures

**Suitable extinguishing media** Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media** Not available.

**Specific hazards arising from the chemical** Not available.

**Special protective equipment and precautions for firefighters** Not available.

**Special Remarks on Fire Hazards**  
Chlorine Trifluoride reacts violently with Aluminum Oxide producing a flame.

## 6. Accidental release measures

**Personal precautions, protective equipment, and emergency procedures**  
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA-approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Methods and materials for containment and cleaning up**  
Stop the flow of material if this is without risk. Collect dust using a vacuum cleaner equipped with a HEPA filter.  
Large Spills: Wet down with water and dike for later disposal. Shovel the material into a waste container. Avoid the generation of dust during clean-up. Following product recovery, flush the area with water.  
Small Spills: Sweep up or vacuum up spillage and collect it in a suitable container for disposal. For waste disposal, see section 13 of the SDS.

**Environmental precautions**  
Avoid discharge into drains, water courses, or onto the ground.

## 7. Handling and storage

**Precautions for safe handling**  
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust. Do not breathe dust. Avoid prolonged exposure. Should be handled in closed systems,

if possible. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

**Conditions for safe storage, including any incompatibilities**

Store locked up. Store in the original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<i>Components</i>	<i>Type</i>	<i>Value</i>	<i>Form</i>
Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)	PEL	5 mg/m <sup>3</sup>	Respirable fraction.
Iron oxide (CAS 1309-37-1)	TWA	10mg/m <sup>3</sup>	Respirable fraction
Zirconium Dioxide (CAS 1314-23-4)	PEL	5mg/m <sup>3</sup>	

#### US OSHA Table Z-3 (29 CFR 1910.1000)

<i>Components</i>	<i>Type</i>	<i>Value</i>	<i>Form</i>
Quartz (SiO <sub>2</sub> ) (CAS 14808-60-7)	TWA	0.3 mg/m <sup>3</sup> 0.1 mg/m <sup>3</sup> 2.4 mppcf	Total dust. Respirable. Respirable.

#### US ACGIH Threshold Limit Values

<i>Components</i>	<i>Type</i>	<i>Value</i>	<i>Form</i>
Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)	TWA	1 mg/m <sup>3</sup>	Respirable fraction.
Iron oxide (CAS 1309-37-1)	TWA	5mg/m <sup>3</sup>	Respirable fraction
Quartz (SiO <sub>2</sub> ) (CAS 14808-60-7)	TWA	0.025 mg/m <sup>3</sup>	Respirable fraction.
Zirconium Dioxide (CAS 1314-23-4)	STEL TWA	10mg/m <sup>3</sup> 5mg/m <sup>3</sup>	

#### US NIOSH: Pocket Guide to Chemical Hazards

<i>Components</i>	<i>Type</i>	<i>Value</i>	<i>Form</i>
Quartz (SiO <sub>2</sub> ) 14808-60-7	TWA	0.05 mg/m <sup>3</sup>	Respirable dust.
Zirconium Dioxide (CAS 1314-23-4)	STEL TWA	10mg/m <sup>3</sup> 5mg/m <sup>3</sup>	

### Biological limit values

No biological exposure limits were noted for the ingredient(s).

### Exposure guidelines

The resin binder in this product was specifically engineered to have low toxicity, with minimal free-phenol

(less than 100ppm in this refractory product) and no free-formaldehyde. Under certain conditions, thermal decomposition products may still include carbon monoxide, carbon dioxide, formaldehyde, phenol, and aromatic and/or aliphatic compounds.

### Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and an emergency shower must be available when handling this product.

### Individual protection measures, such as personal protective equipment

#### Eye/face protection

Wear safety glasses with side shields (or goggles).  
Chemical respirator with organic vapor cartridge, full facepiece, dust, and mist filter.

#### Skin protection

Hand protection  
Other

Wear appropriate chemical-resistant gloves.  
Use of an impervious apron is recommended.

#### Respiratory protection

Use a NIOSH/MSHA-approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

#### Thermal hazards

Wear appropriate thermal protective clothing, when necessary



### General Hygiene Considerations

Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical and chemical properties

### Appearance

Physical state  
Form  
Color

Solid.  
Solid.  
Not available.  
Not available.

### Odor

Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not available.
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

## 10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage, and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction is known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials. Refractories containing crystalline silica may, after service, contain more or less crystalline silica. Care must be taken to avoid and/or control dust from demolition. If in doubt of the proper protection, seek advice from a safety professional. The organic binder in this product falls into a class known as phenolic resin. Refractory products using this type of binder are supplied in two forms, (1) shaped products such as brick and (2) monolithics such as refractory plastics and rams. The hazards associated with phenolic resin are

different in the two forms. For pre-cured shapes (brick), the binder has been reacted or polymerized by heat to its solid form before shipment. On decomposition by heating, where there is sufficient air and heating rate, the gaseous products are mostly carbon dioxide and water. Under low or limited oxygen supply, decomposition products during heat-up and early service may include phenol, as well as aromatic and/or aliphatic derivatives. After a campaign in service, this refractory product should be completely coked and, in that condition, the material for disposal would be carbon and an inorganic oxide. During field installation of non-cured unshaped products (monolithics), there is a possibility of exposure to trace amounts of phenol by skin contact and inhalation. After the product has been heated to high temperatures in service, it will have similar decomposition characteristics to precured shapes.

**Incompatible materials**

Phosphorus. Chlorine. Powerful Oxidizers.  
Incompatibility is based strictly upon potential theoretical reactions between chemicals and may not be specific to industrial application exposure. Contact your sales representative for clarification.

**Hazardous decomposition products**

No hazardous decomposition products are known.

**11. Toxicological information**

**Information on likely routes of exposure**

<b>Inhalation</b>	Dust may irritate the respiratory system. Prolonged inhalation may be harmful.
<b>Skin contact</b>	Dust or powder may irritate the skin.
<b>Eye contact</b>	Dust may irritate the eyes.
<b>Ingestion</b>	Expected to be a low ingestion hazard.

**Symptoms related to the physical, chemical, and toxicological characteristics:**

Dusts may irritate the respiratory tract, skin, and eyes.  
Coughing.

**Information on toxicological effects**

<b>Acute toxicity</b>	Not available.
<b>Skin corrosion/irritation</b>	Prolonged skin contact may cause temporary irritation.
<b>Serious eye damage/eye irritation</b>	Direct contact with the eyes may cause temporary irritation.
<b>Respiratory or skin sensitization</b>	
<b>Respiratory sensitization</b>	Not a respiratory sensitizer.
<b>Skin sensitization</b>	This product is not expected to cause skin sensitization.



**Germ cell mutagenicity** No data is available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity**

In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However, in making the overall evaluation, IARC noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or external factors affecting its biological activity or distribution of its polymorphs." (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicate dust, and organic fibers, 1997, Vol. 68, IARC, Lyon, France.) In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. "There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore, preventing the onset of silicosis will also reduce the cancer risk..." (SCOEL SUM Doc 94-final, June 2003) According to the current state of the art, worker protection against silicosis can be consistently assured by respecting the existing regulatory occupational exposure limits. May cause cancer. Occupational exposure to respirable dust and respirable crystalline silica should be monitored and controlled.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7) 1 Carcinogenic to humans.

**US National Toxicology Program (NTP) Report on Carcinogens**

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7) Known To Be Human Carcinogen.

**US OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not listed.

**Reproductive toxicity**

This product is not expected to cause reproductive or developmental effects.

**Developmental effects**

Quartz (SiO<sub>2</sub>) 0

**Developmental effects - EU category**

Quartz (SiO<sub>2</sub>) 0

**Embryotoxicity**

Quartz (SiO<sub>2</sub>) 0

**Reproductively**

Quartz (SiO<sub>2</sub>) 0



**Specific target organ toxicity - single exposure**

Not classified.

**Specific target organ toxicity - repeated exposure**

Not classified.

**Aspiration hazard**

Not an aspiration hazard.

**Chronic effects**

Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

## 12. Ecological information

**Ecotoxicity**

The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence and degradability**

No data is available on the degradability of this product.

**Bio-accumulative potential**

No data available.

**Mobility in soil**

No data available.

**Other adverse effects**

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

## 13. Disposal considerations

**Disposal instructions**

This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

**Hazardous waste code**

Not applicable.

**Waste from residues / unused products**

Not available.

**Contaminated packaging**

Not available.

## 14. Transport information

**DOT**

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable.

## 15. Regulatory information

### US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. One or more components are not listed on TSCA. All chemical substances in this product are listed on the TSCA chemical substance inventory where required.

#### TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

#### CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

#### SARA 304 Emergency release notification

Not regulated.

#### U.S. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

##### Hazard categories

Immediate Hazard - No

Delayed Hazard - Yes

Fire Hazard - No

Pressure Hazard - No

Reactivity Hazard - No

#### SARA 302 Extremely hazardous substance

Not listed.

#### SARA 311/312 Hazardous Chemical

No

#### SARA 313 (TRI reporting)

<i>Chemical Name</i>	<i>CAS number</i>	<i>% by wt.</i>
Aluminum Oxide (Non-Fibrous)	1344-28-1	*

### Other federal regulations

#### Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not Regulated

#### Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

#### Safe Drinking Water Act (SDWA)

Not regulated.

### US state regulations

#### US California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)

Not listed.

#### US Massachusetts RTK - Substance List

Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7)

ZIRCONIUM DIOXIDE (CAS 1314-23-4)

**US New Jersey Worker and Community Right-to-Know Act**

Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7)

**US Pennsylvania Worker and Community Right-to-Know Law**

Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7)

**US Rhode Island RTK**

Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1)

**US California Proposition 65**

This product contains a chemical known to the State of California to cause cancer.

**US - California Proposition 65 - CRT: Listed date/Carcinogenic substance**

Quartz (SiO<sub>2</sub>) (CAS 14808-60-7)      Listed: October 1, 1988

Formaldehyde (CAS 50-00-0)      Listed: January 1, 1988

## 16. Other information, including date of preparation or last revision

This information is supplied to be informative and to alert the user of the material. The ultimate compliance with federal, state, and/or local regulations concerning the use of this material, or compliance with respect to product liability, rests solely upon the purchaser thereof.

**Prepared by:**      FRC Global  
**Date:**              October 2020

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**End of Safety Data Sheet**