

1. Identification

| | |
|---------------------------------|---|
| Product identifier | FSG A Slide Gate Plates/Nozzles |
| 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

| | |
|------------------------------------|---|
| Company name: | Fedmet Recourses Corporation |
| Address: | 1000 N. West St. Suite 1200 #889 Wilmington, DE 19801 |
| Product Support/Technical Services | Phone: (514) 931-5711 |
| Website | www.fedmet.com |

Emergency telephone number: Corporate Office: (514)931-5711
 Technical Services: (514)931-5711
 Contact E-Mail: ladledr@fedmet.com

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. |
| Storage | Store locked up. |

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| Disposal | Dispose of contents/container in accordance with local/regional/national/international regulations |
| Hazard(s) not otherwise Classified (HNOC) | None Known. |
| Supplemental information | 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. |

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 | * |
| Quartz (SiO ₂) | | 14808-60-7 | * |

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

4. First-aid measures

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

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. |

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 HEPA filter.

Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Avoid the generation of dusts during clean-up. Following product recovery, flush area with water.

Small Spills: Sweep up or vacuum up spillage and collect in 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 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

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 ³ | Respirable fraction. |

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

| <i>Components</i> | <i>Type</i> | <i>Value</i> | <i>Form</i> |
|--|-------------|-----------------------|-------------|
| Quartz (SiO₂) (CAS 14808-60-7) | TWA | 0.3 mg/m ³ | Total dust. |
| | | 0.1 mg/m ³ | Respirable. |
| | | 2.4 mppcf | Respirable. |

US. ACGIH Threshold Limit Values

| Components | Type | Value | Form |
|---|------|-------------------------|----------------------|
| Aluminum Oxide (Non-Fibrous) (CAS 1344-28-1) | TWA | 1 mg/m ³ | Respirable fraction. |
| Quartz (SiO ₂) (CAS 14808-60-7) | TWA | 0.025 mg/m ³ | Respirable fraction. |

US. NIOSH: Pocket Guide to Chemical Hazards

| Components | Type | Value | Form |
|--|------|------------------------|------------------|
| Quartz (SiO ₂) 14808-60-7 | TWA | 0.05 mg/m ³ | Respirable dust. |

Biological limit values

No biological exposure limits 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 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 face piece, 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 | Solid. |
| Form | Solid. |
| Color | Not available. |

Odor

Not available.

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. |
|--------------------------------|----------------|

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|-----------------------------|----------------|
| 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 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 prior to 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 pre-cured 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

Inhalation

Dust may irritate respiratory system. Prolonged inhalation may be harmful.

Skin contact

Dust or powder may irritate the skin.

Eye contact

Dust may irritate the eyes.

Ingestion

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

Acute toxicity

Not available.

Skin corrosion/irritation

Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation

Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization

Not a respiratory sensitizer.

Skin sensitization

This product is not expected to cause skin sensitization.

Germ cell mutagenicity

No data 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 on 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, silicates dust and organic fibres, 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 (SiO₂) (CAS 14808-60-7) 1 Carcinogenic to humans.

US. National Toxicology Program (NTP) Report on Carcinogens

Quartz (SiO₂) (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 (SiO₂) 0

Developmental effects - EU category

Quartz (SiO₂) 0

Embryo toxicity

Quartz (SiO₂) 0

Reproductively

Quartz (SiO₂) 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

Eco toxicity 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.

US. 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

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

Quartz (SiO₂) (CAS 14808-60-7)

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

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

Quartz (SiO₂) (CAS 14808-60-7)

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

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

Quartz (SiO₂) (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 (SiO₂) (CAS 14808-60-7) Listed: October 1, 1988

International Inventories

| <i>Country(s) or region</i> | <i>Inventory name</i> | <i>On inventory (yes/no) *</i> |
|-----------------------------|--|--------------------------------|
| Australia | Australian Inventory of Chemical Substances (AICS) | Yes |
| Canada | Domestic Substances List (DSL) | No |
| Canada | Non-Domestic Substances List (NDSL) | No |
| China | Inventory of Existing Chemical Substances in China (IECSC) | No |
| Europe | European Inventory of Existing Commercial Chemical Substances (EINECS) | Yes |

| | | |
|-----------------------------|---|-----|
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | No |
| Korea | Existing Chemicals List (ECL) | Yes |
| New Zealand | New Zealand Inventory | Yes |
| Philippines | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | No |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | No |

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s). A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

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 respects to products liability, rest solely upon the purchaser thereof.

Reasons for Revision: Converted MSDS to SDS.
Prepared by: Fedmet Resources Corporation
Date: August, 2016

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End of Safety Data Sheet