Safety Data Sheet

Fused Silica/Colloidal Silica Cement

Version Date: 18 May 2018

1. Product and Company Identification

Product Name: Fused Silica/Colloidal Silica Cement
Product Use: Thermal protection tile coating
Manufacturer: Jacobs Technology
Information: JSOG Safety and Health (321-861-2857)
Emergency Telephone: CHEMTREC®, Inside USA: 800-424-9300
CHEMTREC®, Outside USA: 001-703-527-3887

General Comment: CHEMTREC telephone number is to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals.

2. Hazards Identification

2.1 GHS Hazard Classification & Label Elements

This material is not classified according to GHS Classification criteria.

Symbol(s): None
Signal Word: None needed according to classification criteria
Hazard: None needed according to classification criteria
Prevention: Do not breathe dust. Wash thoroughly after handling
Response: Get medical advice/attention if you feel unwell
Storage: None
Disposal: Dispose of material in accordance with all local, regional, national and international regulations
Hazards Summary:
Dust or powder may irritate eye tissue. Dust or powder may irritate the skin. Rubbing may cause abrasion of cornea. Repeated inhalation of dust of this product in very large amounts may cause damage to the lung
Information: JSOG Safety and Health (321-861-2857)

3. Composition/Information in Ingredients:

Hazardous Ingredient(s):

Amorphous Fused silica: 99 % $^{w}/_{w}$ also *identified as amorphous silica, mineral dust*
CAS: 60676-86-0

General: This product is produced by melting silica oxide and cooling to a solid. Processing this article may produce dust or fumes which are considered hazardous under 29 CFR 1910.1200 (OSHA Hazard Communication Standard). This product may be regulated, have exposure limits or other information identified as "Nuisance Particulates".

4. First Aid Measures

General: Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice.

Eyes: Rinse the eyes using eyewash and seek immediate medical evaluation. Remove contact lenses, if present. Do NOT use an eye ointment. Eye injuries should be treated by a physician immediately.

Inhalation: Remove the exposed individual from the contaminated area to a well-ventilated area. If there is any difficulty breathing or other significant symptoms seek immediate medical evaluation or call 911 for assistance.

Skin: Rinse with soap and water for several minutes. If an irritation develops, seek medical advice/attention. Wash contaminated clothing separately before using.

Ingestion: Rinse mouth. Obtain emergency medical attention.

5. Fire Fighting Measures

5.1 Flammable properties: This material will not burn. Use a fire fighting agent suitable for the surrounding fire.

5.2 Extinguishing Media: Foam. Dry powder. Carbon dioxide. Water spray. Sand.

5.3 Firefighter protection: Standard SCBA and bunker gear recommended. No further special protective actions for fire-fighters are anticipated

6. Accidental Release Measures

6.1 Personal precautions: Wear safety glasses with side shields. Use leather work gloves. Ventilate well. If permissible exposure limits have the potential to be exceeded, use a NIOSH approved respirator for dusts/particulate.

6.2 Environmental precautions: Prevent waste from contaminating the surrounding environment. Do not discharge into drains, sewers or public waters.

6.3 Methods for containment: Dike and soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible.

6.4 Methods for clean-up: Collect spillage. Store away from other materials

6.5 Other information: Contact your company environmental department for specific spill and disposal measures.

7. Handling and Storage

7.1 Handling: Avoid inhalation of dusts. Avoid contact with skin and eyes. Wash thoroughly after handling.

7.2 Storage: Keep container dry and closed when not in use. Store in a dry area.

8. Exposure Controls/Personal Protection

8.1 Exposure Limits: (PPM=parts per million)

Silica, Vitreous (60676-86-0) also identified as amorphous silica, mineral dust

ACGIH TLV-TWA:	None established	TLV= Threshold limit value
OSHA PEL:	0.8 mg/m^3	PEL= Permissible exposure limit
NIOSH REL:	6 mg/m^3	REL=Recommended Exposure Limit

8.2 Engineering Controls: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

8.3 Personal Protective Equipment (PPE)

Eye protection: Wear safety glasses or goggles with side shields.

Skin protection: Wear leather or other appropriate work gloves. Wear coveralls.

Respiratory protection: Respiratory equipment is not normally needed. If permissible exposure limits have the potential to be exceeded, use a NIOSH approved respirator for dust.

General: Use good hygiene practices when handling this material including changing and laundering work clothing after use.

9. Physical and Chemical Properties

Appearance and odor	Translucent or white, solid or powder
Odor threshold	Odorless
Specific gravity (water=1)	1.5 – 2.2 gm/cm^3
Density	60-90 lb/ft^3
Vapor pressure	Not applicable
Vapor density (air=1)	Not applicable
Evaporation rate (water=1)	Not applicable
Flash point:	Not applicable
Melting point:	3110 °F (1710 °C)
Boiling point:	4046 °F (2230 °C)
pH	Not applicable
Solubility:	Not applicable

10. Stability and Reactivity

10.1 Chemical stability: Stable
10.2 Conditions to avoid: None known
10.3 Incompatible materials: None known
10.4 Hazardous decomposition products: None known
10.5 Possibility of hazardous reactions: None known

11. Toxicological Information

Component Name	CAS	Data
Silica, Vitreous also identified as amorphous silica, mineral dust	60676-86-0	Potential Health Effects: Acute Toxicity: • Ingestion: o Ingestion, rat LD50: > 5,110 mg/kg • Inhalation: Inhalation may cause irritation to the mucous membranes. o Inhalation, rat LC50: > 0.691 mg/l (4 Hrs) • Skin Contact: Dust may cause mechanical irritation o Dermal, rabbit LD50: 5,000 mg/kg with no significant irritation • Eye Contact: Dust may cause mechanical irritation. Sensitization: • Sensitization: Not Sensitizing Germ Cell Mutagenicity: • In Vitro; Not mutagenic Carcinogenicity: • Limited positive data exists, but the data are not sufficient for classification (mouse derived data) Reproductive and/or Developmental Effects: • Ingestion: Not toxic to female reproduction o Rat: NOAEL 509 mg/kg/day; 1 generation • Inhalation: Not toxic to male reproduction o Rat: NOAEL 497 mg/kg/day; 1 generation • Ingestion: Not toxic to development o Rat: NOAEL 1,350 mg/kg/day; during organogenesis Target Organs (Single Exposure): • For the component/components, either no data are currently available or the data are not sufficient for classification Target Organs (Repeated Exposure): • Inhalation: All data is negative o Human, target organ is respiratory system: silicosis Aspiration Hazard: • For the component/components, either no data are currently available or the data are not sufficient for classification
Overall product	N/A	Same as above since the product is 99% amorphous silica

12. Ecological Information

Component Name	CAS	Data
Silica, Vitreous also identified as amorphous silica, mineral dust	60676-86-0	General: • 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. Acute Toxicity: • No data is available Persistence and degradability: • No data is available Bioaccumulative potential: • No data is available Ecology: • No data is available Mobility in Soil: • No data is available Other Adverse Effects/Considerations: • No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component
Overall product	N/A	Same as above since the product is 99% amorphous silica

13. Disposal Considerations

- 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
- Remove waste in accordance with national, state or local regulations.
- Avoid release in the environment.

14. Transport Information

- **DOT:** Not regulated as dangerous goods.
- **IATA:** Not regulated as dangerous goods.
- **IMDG:** Not regulated as dangerous goods.

15. Regulatory Information

Component Name	CAS	Data
Silica, Vitreous also identified as amorphous silica, mineral dust	60676-86-0	This product contains 99%$^{w}/_{w}$ amorphous, fused silica EPA TSCA Regulatory Flag: • Not regulated RQ (reportable Quantity, §304 of EPA's List of Lists): • Not listed SARA §302 Threshold Planning Quantity (TPQ): • Not listed SARA §311/312 Hazard Classes: • Fire Hazard – No • Pressure Hazard – No • Reactivity Hazard – No • Immediate Hazard – No • Delayed Hazard - No

16. Other Information

SDS prepared: 18 May 2018

Prepared by: Jacobs Space Operations Group (JSOG), Kennedy Space Center, FL 32899

Revision Summary: This SDS has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System Classification and Labeling of Chemicals (GHS).

Disclaimer:

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Jacobs Space Operations Group or any of its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product.

END OF SDS