

Material Safety Data Sheet

Material Name: Emisshield™ Ceramic/Refractory ST-2 (Patent Pending)

ID: WESSEX-002

*** Section 1 - Chemical Product and Company Identification ***

Product Use: High emissivity coatings for use in industrial applications.

Formula: Proprietary Ceramic Mixture

Manufacturer Information

Wessex Incorporated
2000 Kraft Drive
Suite 2600
Blacksburg, VA 24060

Phone: 540-961-0999

*** Section 2 - Composition / Information on Ingredients ***

| CAS # | Component | Percent |
|------------|-------------------|---------|
| 14808-60-7 | Quartz | 30-60 |
| 7631-86-9 | Silica, amorphous | 20-35 |

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Silica, crystalline (general form).

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This material is a controlled product under Canadian WHMIS regulations. This product has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.

*** Section 3 - Hazards Identification ***

Emergency Overview

This is a non-flammable, non-reactive product. It is supplied in the form of a dark gray to black aqueous slurry with little or no odor. Exposure to dust may be irritating to eyes, nose and throat. At very high exposure levels the dust may adversely affect the lungs.

Potential Health Effects: Eyes

May cause irritation. Symptoms may include stinging, tearing and redness.

Potential Health Effects: Skin

May cause slight irritation to the skin.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely. However, ingestion of product may produce gastrointestinal irritation and disturbances.

Potential Health Effects: Inhalation

Dusts of this preparation may cause irritation of the nose, throat, and respiratory tract. Chronic health effects (such as impaired lung function and/or cancer) should not arise unless the product is dried, a respirable airborne dust is formed, and prolonged and repeated breathing of this dried material occurs.

Medical Conditions Aggravated by Exposure

Persons with pre-existing skin disorders, eye irritation, or impaired respiratory function may be more susceptible to the effects of exposure to this product.

HMIS Ratings: Health: 1* **Fire:** 0 **Physical Hazard:** 0 **Pers. Prot.:** safety glasses, gloves

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Flush immediately with water for at least 15 minutes. Do not rub eyes. Seek medical attention if symptoms develop or persist.

First Aid: Skin

For skin contact flush with large amounts of water. Wash affected area with mild soap and water. Seek medical attention if symptoms develop or persist.

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First Aid: Ingestion

If ingested, get immediate medical attention. Do not induce vomiting unless instructed to do so by medical personnel.

First Aid: Inhalation

Move person to non-contaminated air. Seek medical attention if symptoms develop or persist.

*** Section 5 - Fire Fighting Measures ***

Flash Point: Not available

Upper Flammable Limit (UFL): Not available

Auto Ignition: Not available

Rate of Burning: Not available

General Fire Hazards

Product will not burn.

Hazardous Combustion Products

Product is not considered combustible.

Extinguishing Media

Use methods for the surrounding fire.

Fire Fighting Equipment/Instructions

As in any fire, wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this is without risk.

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Absorb spill with inert material. Vacuum material into appropriate container for disposal.

Evacuation Procedures

None necessary.

Special Procedures

Prior to disposal, consult an approved waste disposal operative to ensure regulatory compliance.

*** Section 7 - Handling and Storage ***

Handling Procedures

Dusting or airborne particle contamination is highly unlikely during the shipping, storage, or mixing this product.

Do not breathe dust from this product. Do not get this product in your eyes, on your skin, or on your clothing. Use with adequate ventilation. Wash thoroughly after handling. This product will stain clothing.

Storage Procedures

Store in original containers away from incompatible substances. Keep the container tightly closed. Do not allow material to freeze.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Follow recommended exposure limits.

B: Component Exposure Limits

Quartz (14808-60-7)

ACGIH: 0.05 mg/m3 TWA (respirable fraction)

OSHA: 0.1 mg/m3 TWA (respirable dust)

NIOSH: 0.05 mg/m3 TWA (respirable dust)

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Silica, amorphous (7631-86-9)

NIOSH: 6 mg/m3 TWA

Engineering Controls

Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of dust, appropriate NIOSH/MSHA respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

*** Section 9 - Physical & Chemical Properties ***

Appearance: Dark Grey to Black
Physical State: Slurry
Vapor Pressure: 17.5 mmHg at 68°F (20°C)
Boiling Point: 212°F (100°C)
Solubility (H2O): Not soluble
Freezing Point: 32°F (0°C)

Odor: None to mild
pH: 8.5 +/- 0.5
Vapor Density: Not applicable
Melting Point: Not applicable
Specific Gravity: 1.6 +/- 0.2

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

Stable under normal conditions.

Chemical Stability: Conditions to Avoid

None identified.

Incompatibility

Hydrofluoric acid, metal salts, strong alkalis and strong mineral acids. Silica will dissolve in hydrofluoric acid and produce silicon tetrafluoride, a corrosive gas.

Hazardous Decomposition

None.

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

This product may cause irritation to the eyes, skin and respiratory tract. Asthma or chronic respiratory conditions may be aggravated by exposure to the dried form of this product. Crystalline silica can cause silicosis: a lung disease characterized by coughing, wheezing, impaired lung function and increased sputum production. This damage can be progressive and may cause death. May cause cancer following repeated and prolonged inhalation of the fine dust. Smoking aggravates these effects. Skin and eye contact may cause irritation due to mechanical abrasion. Amorphous silica is chemically and biologically inert when ingested. In addition, silicosis has rarely been found in cases of chronic inhalation of amorphous silica.

B: Component Analysis - LD50/LC50

No LD50/LC50's are available for this product's components.

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Carcinogenicity

A: General Product Information

Exposure to quartz (the most stable and common form of crystalline silica) is responsible for the majority of clinically diagnosed silicosis. Silicosis is a fibronodular lung disease that typically occurs after occupational exposure to crystalline silica for 5 years or longer. Inhalation of quartz dusts may cause shortness of breath, limitation of chest expansion, dry cough, and a lessened capacity for work. Individuals with a pre-existing disease in, or a history of ailments involving the skin or respiratory tract are at a greater risk of developing adverse health effects when exposed to this material.

B: Component Carcinogenicity

Quartz (14808-60-7)

ACGIH: A2 - Suspected Human Carcinogen

NIOSH: potential occupational carcinogen

NTP: Known Carcinogen (related to Silica, crystalline (respirable size)) (Select Carcinogen)

IARC: Monograph 68, 1997 (inhaled in the form of quartz or cristobalite from occupational sources)
(Group 1 (carcinogenic to humans))

Silica, amorphous (7631-86-9)

IARC: Monograph 68, 1997 (Group 3 (not classifiable))

*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

No information available.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Environmental Fate

No information available.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Waste must be handled in accordance with all federal, state, provincial, and local regulations.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: Not regulated for transportation.

TDG Information

Shipping Name: Not regulated for transportation.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No information available.

B: Component Analysis

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

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B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

| Component | CAS | CA | MA | MN | NJ | PA | RI |
|-------------------|------------|-----|-----|-----|-----|-----|----|
| Quartz | 14808-60-7 | No | Yes | Yes | Yes | Yes | No |
| Silica, amorphous | 7631-86-9 | Yes | Yes | Yes | Yes | Yes | No |

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

Canadian WHMIS Information

A: General Product Information

This material is a controlled product under Canadian WHMIS regulations. This product has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.

B: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

| Component | CAS # | Minimum Concentration |
|-------------------|------------|---|
| Quartz | 14808-60-7 | 1 % (English Item 1406, French Item 1491) |
| Silica, amorphous | 7631-86-9 | 1 % (English Item 1403, French Item 1488) |

WHMIS Classification: D2A, D2B

Additional Regulatory Information

A: General Product Information

No additional information available.

B: Component Analysis - Inventory

| Component | CAS # | TSCA | CAN | EEC |
|-------------------|------------|------|-----|--------|
| Quartz | 14808-60-7 | Yes | DSL | EINECS |
| Silica, amorphous | 7631-86-9 | Yes | DSL | EINECS |

*** Section 16 - Other Information ***

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

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Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists. AICS = Australian Inventory of Chemical Substances. CAS = Chemical Abstract Service. CERCLA = Comprehensive Environmental Response, Compensation and Liability Act. CFR = Code of Federal Regulations. CHEMTREC = Chemical Transportation Emergency Center. DSL = Canadian Domestic Substance List. EINECS = European Inventory of New and Existing Chemical Substances. EPA = Environmental Protection Agency. HEPA = High Efficiency Particulate Air. HMIS = Hazardous Materials Identification System. IARC = International Agency for Research on Cancer. IDLH = Immediately Dangerous to Life and Health. NDSL = Canadian Non-Domestic Substance List. NFPA = National Fire Protection Association. NIOSH = National Institute of Occupational Safety and Health. NJTSR = New Jersey Trade Secret Registry. NTP = National Toxicology Program. OSHA = Occupational Safety and Health Administration. NA = Not available or Not Applicable. SARA = Superfund Amendments and Reauthorization Act. TDG = Transportation of Dangerous Goods. TLV = Threshold Limit Value. TSCA = Toxic Substances Control Act. WHMIS = Workplace Hazardous Materials Information System.

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This is the end of MSDS # WESSEX-002