SAFETY DATA SHEET

1 PRODUCT AND COMPANY IDENTIFICATION

Product Type: Malarkey Broadcast (Finish) Granules

Trade Name:
2200R Reflective Granules

Use: High quality, solar reflective granules for use on Malarkey reflective cap sheets

Manufacturer:
Malarkey Roofing Products
P.O. Box 17217
3131 N. Columbia Blvd.
Portland, OR 97217
Phone: 503-283-1191
WWW.MALARKEYROOFING.COM

Emergency Contact:
CHEMTREC®: 1-800-424-9300 (24 HOUR)

2 HAZARD(S) IDENTIFICATION

GHS CLASSIFICATION

Signal Word: HEALTH HAZARD
Carcinogenicity: Category A2
HAZARD STATEMENTS

- May cause cancer by inhalation.
- Causes damage to lungs through prolonged or repeated exposure by inhalation.

PRECAUTIONARY STATEMENTS

- Use in a well-ventilated area.
- Do not handle until all safety precautions have been read and understood.
- Do not breathe dust.
- Avoid creating dust when handling, using, or storing.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients	CAS #	Ingredient %
Calcined Kaolin Clay (calcined aluminum silicate)	92704-41-1	95-100
Quartz (crystalline silica)	14808-60-7	0-5

4 FIRST-AID MEASURES

Eye contact: Immediately flush eyes with large amounts of running water, occasionally lifting the eye lids to ensure thorough rinsing. Get medical attention if irritation persists or if there is an embedded foreign body.
Skin contact: No first aid should be needed since dermal contact with his product does not affect the skin. Wash exposed skin with soap and water before breaks and at end of the shift.
Ingestion: If large amounts swallowed, get immediate medical attention.
Inhalation: If inhalation of dust occurs, remove person to fresh air. If breathing has stopped, perform artificial respiration. If breathing is difficult, have qualified personnel administer oxygen. Get prompt medical attention.

5 FIRE-FIGHTING MEASURES

Extinguishing media: Use extinguishing media appropriate for surrounding fire.
Specific hazards arising from chemical: Product is not flammable, combustible or explosive.
Special protective equipment and precautions for fire fighters: None required.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions: Wear appropriate protective clothing and respiratory protection. Do not generate airborne dust during cleanup.
Environmental precautions: Collect for appropriate disposal.
Methods for cleaning up: If uncontaminated, collect using dustless method (HEPA vacuum or wet method) and place in appropriate container for use. If contaminated: a) use appropriate method for nature of contamination, and b) consider possible toxic or fire hazards associated with the contaminating substances.

7 HANDLING AND STORAGE

Handling: Do not breathe dust. Do not rely on your sight to determine if dust is in the air. Silica may be in the air without a visible dust cloud. Use adequate exhaust ventilation and dust collection to reduce dust and respirable crystalline silica dust levels to below the permissible exposure limit (“PEL”) or other applicable limit (if lower than the PEL). Maintain and test ventilation and dust collection equipment. Use all available work practices to control dust exposures, such as water sprays. Practice good housekeeping. Do not permit dust to collect on walls, floors, sills, ledges, machinery, or equipment. Keep airborne dust concentrations below permissible exposure or other applicable limits,

Where necessary to reduce exposures below the PEL or other applicable limit (if lower than the PEL), wear a respirator approved for silica dust when using, handling, storing, or disposing of the product or bag. See Section 8 for further information on respirators. Do not alter the respirator. Do not wear a tight-fitting respirator with facial hair such as a beard or mustache that prevents a good seal between the respirator and face. Maintain, clean, and fit-test respirators in accordance with applicable standards. Wash or vacuum clothing that has become dusty.

Participate in training, exposure monitoring, and health surveillance programs to monitor and prevent potential adverse health effects that may be caused by breathing respirable crystalline silica. OSHA Respirable Crystalline Silica Standards: 29CFR1910.1053, 1915.1053 and 1926.1053, OSHA Hazard Communication Standard, 29 CFR Sections 1910.1200, 1915.1200, 1917.28, 1918.90, 19268.59 and 1928.21, and state and local worker or community "right-to-know" laws and regulations should be strictly followed.

Conditions for safe storage, including any incompatibilities: Use dust collection to trap dust produced during loading and unloading. Keep containers closed and sort bags to avoid accidental tearing, breaking, or bursting.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Components	CAS #	OSHA PEL	ACGIH TLV	NIOSH REL
Calcine Kaolin Clay	92704-41-1	5 mg/m^3 TWA (respirable dust) 15 mg/m^3 TWA (total dust)	2 mg/m^3 TWA (respirable dust)	5 mg/m^3 TWA (respirable dust) 15 mg/m^3 TWA (total dust)
Crystalline Silica	14808-60-7	0.05 mg/m^3 TWA (respirable dust)	0.025 mg/m^3 TWA (respirable dust)	0.05 mg/m^3 TWA (respirable dust)

Respiration: When effective engineering controls are not feasible, or while they are being implemented, appropriate respiratory protection must be used. Use appropriate respirator protection for respirable particulates based on consideration of airborne workplace concentrations and duration of exposure arising from intended end use. Refer to the most recent standards of ANSI (Z88.2), OSHA (29 CFR 1910.138), MSHA (30 CFR Parts 56 and 57), and NIOSH respirator decision logic.
Ventilation: Use local exhaust as required to maintain exposures as far as possible below applicable occupational exposure limits. See also ACGIH "Industrial Ventilation – A Manual for Recommended Practice" (current edition). Control of exposure to dust must be accomplished as far as feasible by accepted engineering control measures.
Eye protection: Safety glasses with side shields must be used when handling.
Skin protection: Protective gloves recommended.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance and odor: White granules
Odor threshold: Not Applicable
Vapor pressure: Not Applicable
pH: Not Applicable
Vapor density (Air = 1): Not Applicable
Viscosity: Not Applicable; solid
Boiling point: Not determined
Melting point: >1700°F
Solubility (IES): Insoluble in water, soluble in hydrochloric acid
Flash point: Fully oxidized, will not burn
Evaporation rate (Butyl Acetate = 1): Not Applicable
Flammability (Solid and Gas): Not Applicable
Auto-ignition temperature: Will not burn
Upper/lower flammability or explosive limits: Not Applicable
Decomposition temperature: Not determined

10 STABILITY AND REACTIVITY

Stability: Stable
Reactivity: Reactivity will not occur.
Conditions to avoid: Avoid dust generation in handling and use.
Hazardous reaction: Polymerization will not occur.
Incompatibility (materials to avoid): Powerful oxidizers such as fluorine, chlorine trifluoride, and oxygen difluoride and hydrofluoric acid.

11 TOXICOLOGICAL INFORMATION

Eye: Particles may cause abrasive injury.
Skin: May cause dry skin.
Inhalation: Dust may cause upper respiratory irritation. Symptoms of exposure may include cough, sore throat, nasal congestion, sneezing, wheezing, and shortness of breath.
Ingestion: Ingestion is an unlikely route of exposure. If dust is swallowed, it may irritate the mouth and throat.
Chronic effects: Prolonged inhalation of respirable crystalline silica may cause lung disease, silicosis, lung cancer and other effects as indicated below.

The method of exposure that can lead to adverse health effects, inhalation, described below:

A. Silicosis
Silicosis can exist in several forms, chronic (or ordinary), accelerated, or acute:

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years (10 to 20 or more) of prolonged repeated inhalation of relatively low levels of airborne, respirable, crystalline silica dust. It is further defined as either simple or complicated silicosis. Simple silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function, or disability. Simple silicosis may be progressive and develop into complicate silicosis or progressive massive fibrosis (PMF). Complicated silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. If present, complicated silicosis of PMF symptoms include shortness of breath and cough. Complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMGF can result in heart disease secondary to the lung disease (cor pulmonale).

Accelerated Silicosis can occur with prolonged, repeated inhalation of high concentrations of respirable crystalline silica over relatively short periods; the lung lesions can appear within five (5) years of initial exposure, progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that lung lesions appear earlier, and progression is more rapid.

Acute Silicosis can occur after the repeated inhalation of very high concentrations of respirable crystalline silica over a short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough, weakness, and weight loss. Acute silicosis is fatal.

B. Cancer
IARC – The International Agency for Research on Cancer ("IARC") concluded that "crystalline silica in the form of quartz or cristobalite dust is *carcinogenic to humans* (group1)." For further information on the IARC evaluation see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "A Review of Human Carcinogens: Arsenic, Metals, Fibers, and Dusts" (2011).

NTP classifies "Silica, Crystalline (respirable size)" as a known human carcinogen.

C. Autoimmune Diseases
Several studies have reported excess cases of several autoimmune disorders -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis – among silica exposed workers.

D. Tuberculosis
Individuals with silicosis are at increased risk to develop pulmonary tuberculosis if exposed to tuberculosis bacterial. Individuals with chronic silicosis have a three-fold higher risk of contracting tuberculosis than similar individuals without silicosis.

E. Kidney Disease
Several studies have reported excess cases of kidney diseases, included end stage renal disease, among silica-exposed workers. For additional information on the subject, the following may be consulted: "Kidney Disease and Silicosis," Nephron, Volume 85, pp. 14-19 (2000).

F. Non-malignant Respiratory Diseases
The reader is referred to Section 3.5 of the NIOSH Special Hazard Review cited below for information concerning the association between exposure to crystalline silica and chronic bronchitis, emphysema, and small airways disease. There are studies that disclose an association between dusts found in various mining occupations and non-malignant respiratory diseases, particularly among smokers. It is unclear whether the observed associations exist only with underlying silicosis, only among smokers, or results from exposure to mineral dusts generally (independent of the presence or absence of crystalline silica, or the level of crystalline silica in the dust).

Sources of information:
The *NIOSH Hazard Review – Occupational Effects of Occupational Exposure to Respirable Crystalline Silica* published in April 2002 summarizes and discusses the medical and epidemiological literature on the health risks and diseases associated with occupational exposures to respirable crystalline silica. *The NIOSH Hazard Review* is available from NIOSH – Publications Dissemination, 4676 Columbia Parkway, Cincinnati, OH 45226, or through the NIOSH website, www.cdc.gov/niosh/topics/silica, then click on the link "NIOSH Hazard Review: Health Effects of Occupational Exposure to Respirable Crystalline Silica."

For a more recent review of the health effects of respirable crystalline silica, the reader may consult *Fisherman's Pulmonary Diseases and Disorders,* Fourth edition, chapter 570 "Coal Workers' Lung Diseases and Silicosis."

The U.S. Occupational Safety and Health Administration (OSHA) Published a summary of respirable crystalline silica health effects in connection with OSHA's Proposed Rule regarding occupational exposure to respirable crystalline silica. The summary was published in the September 12, 2013 Federal Register, which can be found at www.federalregister.gov/articles/2013/09/12/2013-20997/occupational-exposure-to-respirable-crystalline-silica.

Numerical measures of toxicity:
Crystalline Silica (quarts): LD50 oral Rat >22,500 mg/kg
Kaolin: LD50 oral rat >5000 mg/kg

12 ECOLOGICAL INFORMATION

Ecotoxicity: Calcined Kaolin Clay and crystalline silica are not known to be ecotoxic. There is no data that suggests Calcined Kaolin Clay or crystalline silica is toxic to birds, fish, invertebrates, microorganisms or plants.
Persistence and degradability: Calcined Kaolin Clay is not degradable.
Bioaccumulative potential: Calcined Kaolin Clay is not bioaccumulative.
Mobility in soil: Calcined Kaolin Clay is not mobile in soil.
Other adverse effects (GHG, Ozone): No data available.

13 DISPOSAL CONSIDERATIONS

This product has not been regulated as a hazardous waste by the USEPA. Otherwise, dispose in accordance with Federal, State, and Local regulations.

14 TRANSPORT INFORMATION

UN number: Not applicable
UN proper shipping name: Not regulated
Packing group, if applicable: Not applicable
Environmental hazards: Not applicable
Transport in bulk: Not applicable
Special precautions: Not applicable

15 REGULATORY INFORMATION

Toxic Substances Control Act (TSCA): All components of this product are listed on the EPA TSCA inventory or exempt from premanufacture notification requirements.
Comprehensive Environmental Response Compensation and Liability (CERCLA): None
European Inventory of Commercial Chemical Substances: All compounds of the product are listed on the EINECS Inventory or exempt from notification requirements.
Section 311/312 Hazard Categories: Chronic Health
Section 313 Reportable Ingredients: None

California Proposition 65: ⚠WARNING: This product can expose you to chemicals, including bitumen, which is known to the State of California to cause cancer. For more information go to: www.P65Warnings.ca.gov.
S38: In case of insufficient ventilation, wear suitable respiratory equipment.

16 OTHER INFORMATION

HMIS RATING

HEALTH: *
FLAMMABILITY: 0
REACTIVITY: 0
PERSONAL PROTECTION: E

*For further information on health effects, see Sections 2, 8 and 11 of this SDS.

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