

Material Safety Data Sheet

Material Name: TUFCEM® SILICATE GUNITE FILLER

ID:

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

Product Trade Name TUFCEM SILICATE GUNITE FILLER

Manufacturer Information

Ergon Armor (601) 933-3540
Corrosion Engineering
P.O. Box 1639 (800) 424-9300
Jackson, MS 39215-1639

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

CAS #	Component	Percent	OSHA
14808-60-7	Quartz	70-90	Y
16893-85-9	Sodium Silicofluoride	5-15	Y
1332-58-7	Kaolin	1-10	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communication Standard (29 CFR 1910.1200).

The components of this product are all on the TSCA inventory list.

*** Section 3 - Hazards Identification ***

Emergency Overview:

Light to medium-grey, odorless powder

WARNING!

CANCER HAZARD. CONTAINS CRYSTALLINE SILICA, WHICH CAN CAUSE CANCER.

Repeated and prolonged inhalation of respirable particles can cause lung cancer and delayed lung damage (silicosis).

MAY CAUSE EYE AND SKIN IRRITATION.

MAY CAUSE RESPIRATORY TRACT IRRITATION.

Potential Health Effects:

Quartz

Skin contact and inhalation are expected to be the primary routes of occupational exposure to this material. Repeated and prolonged inhalation of this material may cause a form of disabling lung disease (commonly known as silicosis). Clinical signs and symptoms of silicosis include cough, shortness of breath, wheezing and impairment of lung function. Impairment of lung function may be progressive. In the usual case of silicosis, there is a slow deterioration of capacity for physical effort, decreased chest expansion, and an increased susceptibility to tuberculosis and other respiratory infections. This material inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC) and respirable forms of this material are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program.

Short term, extremely heavy exposures to dust of this material (particularly small-sized particles) can result in acute silicosis. This disease is rapidly progressive with diffuse pulmonary involvement, which may develop within months of initial exposure. Individuals with acute silicosis may suffer an abrupt onset of violent coughing, labored breathing, and weight loss; death has been known to occur within one to two years.

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Kaolin

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. This material has a low order of acute toxicity, but contact with skin and eyes to excessive dust levels may cause irritation from mechanical abrasion. Acute overexposure to dusts may cause upper respiratory tract irritation. Long-term inhalation of dusts of this material may cause progressive fibrosis of the lungs leading to impaired lung function and pneumoconiosis, a benign lung change.

Sodium silicofluoride

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on single exposure animal tests, this material is anticipated to be moderately toxic if swallowed, slightly irritating to skin and severely irritating to eyes. Severe or repeated exposure may cause kidney damage and bone effects including joint pain, tooth erosion and discoloration. Medical conditions aggravated by exposure to this material include kidney disease.

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

Eye Contact:

Immediately flush with plenty of water. Get medical attention if irritation persists.

If On Skin

Immediately flush with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Ingestion:

Induce vomiting as directed by medical personnel. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

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

Flash Point: N/A

Method Used: N/A

Flammability N/A
Classification:

Upper Flammable N/A
Limit (UFL):

Lower Flammable N/A
Limit (LFL):

Fire & Explosion Hazards:

Auto-Ignition Temperature - N/A

Flash Point (Flash Point Method) - N/A

Flammable Limits- Upper - N/A

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Lower - N/A

Extinguishing Media

Use extinguishing media appropriate to surrounding fire conditions.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Avoid breathing fumes from fire-exposed material.

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

Spill or Leak

Avoid creating dust in handling, transfer or clean up. Contain spill. Sweep or scoop up and remove to suitable container. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

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

Handling Procedures:

Do not breathe dust. Keep container closed. Use only with adequate ventilation. Do not get in eyes, on skin or clothing. Wash thoroughly after handling.

Storage Procedures:

Store in a cool, dry place. Avoid excessive heat. Store out of direct sunlight in a cool, well-ventilated place.

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

Component Exposure Limits

Kaolin (1332-58-7)

ACGIH: 2 mg/m³, TLV-TWA (respirable particle)
OSHA: 5 mg/m³ PEL-TWA (respirable dust)
NIOSH: 15 mg/m³ PEL-TWA (total dust)

Quartz (14808-60-7)

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ACGIH: 0.025 mg/m³, TLV-TWA (respirable particle), A2 – Suspected Human Carcinogen
OSHA: 10 mg/m³/(% SiO₂ +2), PEL-TWA (respirable dust)
NIOSH: 0.05 mg/m³ (REL – respirable dust)

Sodium Silicofluoride (16893-85-9)

ACGIH: 2.5 mg/m³, TLV-TWA (Fluoride, as F)

Engineering Controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:

Where there is potential for eye contact, wear chemical goggles and have eye-flushing equipment available.

Skin Protection:

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection:

When airborne exposure limits are exceeded (see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full-face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

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

Physical State: Solid
Odor: None
Vapor Density: N/A
Melting Point: N/A
pH: N/A
VOC: NONE

Appearance: Light tan to gray powder
Vapor Pressure: Nil
Boiling Point: N/E
Specific Gravity: N/A
Viscosity: N/A
Solubility Water: Slightly soluble

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

Chemical Stability:

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility:

Hydrofluoric acid will dissolve quartz to form the corrosive gas silicon tetrafluoride

Decomposition Products:

None known.

Hazardous Polymerization:

Hazardous polymerization is not known to occur.

*** Section 11 - Toxicological Information ***

Acute Toxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - LD50/LC50

Data on this material and/or its components are summarized below.

Quartz

Chronic inhalation of crystalline silica may cause a progressive pneumoconiosis (silicosis), a form of disabling lung disease (pulmonary fibrosis). Data from animal studies on crystalline forms of silica confirm the capacity of free crystalline silica to induce a fibrinogenic response in lungs. Studies on a variety of laboratory animals (rats, guinea pigs, rabbits, and monkeys) using inhalation as well as intratracheal routes of exposure indicate the ability of crystalline silica to produce silicosis similar to that seen in man. In addition, experiments in animals have confirmed human experience that the presence of crystalline silica in the lung increased susceptibility to tuberculosis and other lung infections. Crystalline silica inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), and respirable forms of crystalline silica are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program. The IARC listing is based on the determination that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz from occupational exposures. Epidemiology studies cited by IARC give indications of increased risk for lung cancer from inhaled crystalline silica (quartz) resulting from occupational exposure. Studies involving heavy industrial exposure to silica in granite and foundry workers, brick factories and sandblasting produced increased levels of protein and enzymes in urine, which is indicative of kidney damage.

Sodium Silicofluoride

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Single exposure (acute) studies indicate that this material is moderately toxic to rats if swallowed (LD50 125 mg/kg), slightly irritating to rabbit skin and severely irritating to rabbit eyes. Accidental poisonings with amounts as little as one-half teaspoon have resulted in death with symptoms including gastrointestinal irritation, nausea, diarrhea, weakness, and cardiac and respiratory failure. This material produced no genetic changes in standard tests using bacterial and animal cells.

Kaolin

Single exposure (acute) studies indicate that this material is practically non-toxic to rats if swallowed (LD50 148,000 mg/kg). This material is widely used as an anti-caking agent in certain foods. Therapeutic administration of this material has shown that humans can ingest more than 600 g/day without adverse effects. Findings of skin irritation has not been reported in the literature. Studies of workers who are chronically exposed to clay in mining, bagging and loading operations show that the only organ affected is the lung. Chronic inhalation of dusts of this material produces a benign pneumoconiosis with a small proportion of exposed workers progressing to complicated pneumoconiosis with fibrotic changes in the lungs. The benign disease does not show any decrease in the respiratory function, but the complicated form results in obstruction and respiratory impairment. A large study which examined the majority of mine workers in the United States handling low-silicate material concluded that this material alone can result in pneumoconiosis and is not dependent upon the presence of crystalline silica.

Feeding studies in rats fed large amounts of this material in the diet for four weeks to twelve months showed no adverse effects other than reduced weight gain. Several chronic inhalation studies of one to two years duration have been conducted with rats and guinea pigs. This material was slightly fibrogenic in the animals' lungs, but was not considered to be likely to cause severe pulmonary disease. Intratracheal instillation to mice and guinea pigs showed slight fibrosis which was much less than quartz control treated animals.

Component Carcinogenicity

Crystalline silica inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), and respirable forms of crystalline silica are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program. The IARC listing is based on the determination that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz from occupational exposures. Epidemiology studies cited by IARC give indications of increased risk for lung cancer from inhaled crystalline silica (quartz) resulting from occupational exposure.

Chronic Toxicity

Data on this material and/or its components are summarized below:

Quartz

Chronic inhalation of crystalline silica may cause a progressive pneumoconiosis (silicosis), a form of disabling lung disease (pulmonary fibrosis). Data from animal studies on crystalline forms of silica confirm the capacity of free crystalline silica to induce a fibrinogenic response in lungs. Studies on a variety of laboratory animals (rats, guinea pigs, rabbits, and monkeys) using inhalation as well as intratracheal routes of exposure indicate the ability of crystalline silica to produce silicosis similar to that seen in man. In addition, experiments in animals have confirmed human experience that the presence of crystalline silica in the lung increased susceptibility to tuberculosis and other lung infections. Crystalline silica inhaled in the form of quartz is classified as "carcinogenic to humans" by the International Agency for Research on Cancer (IARC), and respirable forms of crystalline silica are listed as substances that "may reasonably be anticipated to be carcinogens" by the National Toxicology Program. The IARC listing is based on the determination that there is sufficient evidence in humans for the carcinogenicity of inhaled crystalline silica in the form of quartz from occupational exposures. Epidemiology studies cited by IARC give indications of increased risk for lung cancer from

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inhaled crystalline silica (quartz) resulting from occupational exposure. Studies involving heavy industrial exposure to silica in granite and foundry workers, brick factories and sandblasting produced increased levels of protein and enzymes in urine, which is indicative of kidney damage.

Epidemiology:

No information available for the product.

Neurotoxicity:

No information available for the product.

Mutagenicity:

No information available for the product.

Teratogenicity:

No information available for the product.

*** Section 12 - Ecological Information ***
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Ecotoxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Data on this material and/or its components are summarized below.

Quartz

No data is available for this component.

Kaolin

This material is generally non-toxic to aquatic organisms. It is not water soluble but can be suspended in water. It was tested for aquatic toxicity with a variety of aquatic organisms and the lowest LC50 was 3,000 mg/l.

Sodium Silicofluoride

This material is slightly toxic to bluegill sunfish (LC50 65 mg/l).

Environmental Fate:

No data is available concerning the environmental fate, biodegradation or bioconcentration for this product.

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*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

Recover, reclaim or recycle when practical. Dispose of in an approved landfill if allowed locally. Comply with federal, state, and local regulations. Dispose of in a permitted waste management facility if landfill is not practical.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

B: Component Waste Numbers

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

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: NOT regulated by DOT

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

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).

SARA 311/312: Acute: Y Chronic: Y Fire: N Pressure: N Reactive: N

State Regulations

A: General Product Information

No additional information available.

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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	FL	MA M	N Nj	PA
Quartz	14808-60-7	Yes	Yes	Yes	Yes	Yes

California Prop 65 – Carcinogen

This product does contain the following chemical(s), as indicated below, currently on the California list of Known Carcinogens.

Quartz

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis – Inventory/Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Quartz	14808-60-7	Yes	Yes	Yes
Sodium Silicofluoride	16893-85-9	Yes	Yes	Yes
Kaolin	1332-58-7	Yes	Yes	Yes

C: 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	0.1%/wt

* * * Section 16 - Other Information * * *

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Ergon Armor bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.