

Material Safety Data Sheet

Product Name / Identifier: Tennessee

Test Subject Material Type: Quartzitic Natural Sandstone

1.0 Chemical Product and Company Identification

Product Name: Tennessee

Buechel Stone Corporation
N4399 Hwy 175 South
Fond du Lac, WI 54937

Emergency Contacts:

CHEMTREC (24 hours everyday): 1.800.424.9300 CANUTEC
(Canada-24hourseveryday): 1.613.996.6666

Health and Technical Contacts:

ScottBuechel: (8am-5pmM-F): 920.922.4790

2.0 Composition / Information on Ingredients

Chemical Name	Percent by Weight (Approx)	MSHA/OSHA PEL	ACGIH TVL
Silicon Dioxide (SiO ₂)	40-75%	(R) 10 mg/m ³	0.025 mg/m ³
Aluminum Oxide (Al ₂ O ₃)	12-20%	(T) 15 mg/m ³ (R) 5 mg/m ³	10 mg/m ³
Ferrous Oxide (FeO)	<10%	-----	5 mg/m ³
Ferric Oxide (Fe ₂ O ₃)	<4%	10 mg/m ³	5 mg/m ³
Magnesium Oxide (MgO)	<8%	15 mg/m ³	10 mg/m ³
Calcium Oxide (CaO)	<11%	5 mg/m ³	2 mg/m ³
Sodium Oxide (Na ₂ O)	<8%	-----	2 mg/m ³ as NaOH
Potassium Oxide (K ₂ O)	<8%	-----	-----
Titanium Oxide (TiO ₂)	<1%	15 mg/m ³	10 mg/m ³

3.0 Hazards Identification / Health, First Aid, and Medical Data

Appearance:

Quartzite is a mixture of angular or round multicolored particles from powder to boulders. It is odorless and not flammable. Respirable dust particles containing silicon dioxide may be generated by handling quartzite. Inhalation of excessive particulate matter may cause respiratory problems. Crystalline silica, a component of this product, has been designated as a Group I carcinogen by IARC.

Potential Health Effects / Overexposure:

The information below represents an overview of health effects caused by overexposure to one or more components in quartzite. The individual effects are described in the Toxicology Information Section 10.

Primary route(s) of exposure: Inhalation

Eyes / Eye Contact:

Direct contact with dust may cause irritation by mechanical abrasion. Conjunctivitis may occur.

Skin Contact:

Direct contact with dust may cause irritation by mechanical abrasion. Some components of material are also known to cause mild corrosive effects to skin and mucous membranes.

Skin Absorption:

Not expected to be a significant route of exposure.

Ingestion:

Small amounts (a tablespoonful) swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

Inhalation:

Dust may irritate nose, throat, mucous membranes, and respiratory tract by mechanical abrasion. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Repeated excessive exposure may cause pneumoconiosis, such as silicosis and other respiratory effects.

Notes on Silicosis:

Use of quartzite for construction purposes is not believed to cause acute toxic effects. Repeated overexposures to respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as 6 months has caused acute silicosis.

Symptoms of acute silicosis include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain. Acute silicosis is a rapidly progressive, incurable lung disease and is typically fatal.

Chronic exposure to respirable quartz-containing dust in excess of appropriate exposure limits has caused silicosis, a progressive pneumoconiosis (lung disease). Restrictive and/or obstructive lung function changes may result from chronic exposure. Chronic tobacco smoking may further increase the risk of developing chronic lung problems.

Medical Conditions Aggravated by Exposure:

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Smoking and obstructive / restrictive lung diseases may also exacerbate the effects of excessive exposure to this product.

First Aid Measures:

Eyes / Eye Contact:

Immediately flush eye(s) with plenty of clean water for at least 15 minutes, while holding the eyelid(s) open. Occasionally lift the eyelid(s) to ensure thorough rinsing. Beyond flushing, do not attempt to remove material from the eye(s). Contact a physician if irritation persists or develops later.

Skin Contact:

Wash with soap and water. Contact a physician if irritation persists or develops later.

Ingestion:

If person is conscious, give a large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Get medical attention.

Inhalation:

Remove to fresh air. Dust in throat and nasal passages should clear spontaneously. Contact a physician if irritation persists or develops later.

4.0 Fire and Explosive Hazard Data

Flash Point:	Not Flammable
Flammable Limits in Air:	Not Flammable
Extinguishing Agent:	None Required
Unusual Fire & Explosion Hazard:	Contact with powerful oxidizing agents may cause fire and/or explosions (see Section 9 of this MSDS).

5.0 Accidental Release Measures

Steps to be Taken in Case Material is Released or Spilled:

Persons involved in cleaning should first follow the precautions defined in Section VII of the MSDS. Spilled materials, where dust can be generated, may overexpose cleanup personnel to respirable quartz-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry sweep spilled material.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

6.0 Handling and Storage

This product is not intended or designed for, and should not be used as an abrasive blasting medium or for foundry applications.

Follow protective controls set forth in Section 7 of this MSDS when handling this product. Respirable quartz-containing dust may be generated during processing, handling and storage. Do not breathe dust. Avoid contact with skin and eyes.

Do not store near food or beverages or smoking materials.

Do not stand on piles of materials; it may be unstable.

7.0 Exposure Controls/Special Protection Information

Engineering Controls:	Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limit. If a person breathes large amounts of this material, move the exposed person to fresh air at once; other measures are usually unnecessary. Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.
Eye / Face Protection:	Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. If product contacts the eyes, immediately wash the eyes with large amounts of water, occasionally lifting the lower and upper lids. Get medical attention immediately. Contact lenses should not be worn when working with this material.
Skin Protection:	No personal protection recommended.

Respiratory Protection:

Respirator Recommendations:

For respirable quartz levels that exceed or are likely to exceed appropriate exposure limits, a NIOSH-approved 100 series particulate filter respirator must be worn. If respirable quartz levels exceed or are likely to exceed an 8 hour-TWA of 0.5 mg/m³, a NIOSH-approved air purifying, full-face respirator with a 100 series particulate filter must be worn. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements. For additional information contact NIOSH at 1-800-356-4674.

Emergency or planned entry into unknown concentrations or IDLH conditions: Any self-contained breathing apparatus that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions: Any air-purifying, full-face piece respirator with a high efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus.

General Hygiene Considerations:

There are no known hazards associated with this material when used as recommended. Following the guidelines in this MSDS are recognized as good industrial hygiene practices. Avoid breathing dust. Avoid skin and eye contact. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

8.0 Physical and Chemical Properties

Appearance:

Angular or round multicolored particles ranging in size from powder to boulders.

Odor

Odorless

Physical State:

Solid Material

Boiling Point:

Not Applicable

Melting Point:

Not Applicable

Vapor Pressure:

Not Applicable

% Volatile by Volume:

Not Applicable

Vapor Density:

Not Applicable

Evaporation Rate:

Not Applicable

Solubility in Water:

Negligible

Solubility in Alcohol:

No

Solubility in Other Solvent:

No

9.0 Chemical Stability and Reactivity Information

Stability:	Stable
Conditions to Avoid:	Contact with incompatible materials (see below)
Incompatibility (Materials to avoid):	Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Silica dissolves in hydrofluoric acid producing a corrosive gas – silicon tetrafluoride.
Hazardous Decomposition Products:	Silica containing respirable dust particles may be generated by handling quartzite.

10.0 Special Precautions / Toxicological Information

This product is a mixture of components. The composition percentages are listed in Section 2. Toxicological information for each component is listed below:

Silicon Dioxide: It is comprised of amorphous and crystalline forms of silica. In some batches, crystalline silica may represent up to 100% of silicon dioxide.

Respirable crystalline silica (quartz):

ACGIH TLV= 0.025 mg/m³

MSHA and OSHA PEL:

Crystalline quartz (respirable); PEL-TWA 10 mg/m³/ (%SiO₂+ 2).

Crystobalite: Use 1/2 the value calculated from the count or mass formula for quartz.

Tridymite: Use 1/2 the value calculated from the formulae for quartz.

Other Particulates: TLV = 10 mg/m³ (inhalable/total particulate, not otherwise classified), TLV = 3 mg/m³ (respirable particulate, not otherwise classified), OSHA PEL = 15 mg/m³ (total particulate, not otherwise regulated), OSHA PEL = 5 mg/m³ (respirable particulate, not otherwise regulated)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate exposure limits. Lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Occupational exposure to free silica is known to produce silicosis, a chronic, disabling lung disease characterized by the formation of silica-containing nodules of scar tissue in the lungs.

Simple-silicosis, in which the nodules are less than 1 cm in diameter is generally asymptomatic but can be slowly progressive, even in the absence of continued exposure.

Silicosis leads to conditions such as lung fibrosis and reduced pulmonary function. The form and severity in which silicosis manifests itself depends in part to the type and extent of exposure to silica dusts, chronic, accelerated and acute forms are all recognized. In later stages the critical condition may become disabling and potentially fatal. Restrictive and/or obstructive changes in lung function may occur due to exposure. A risk associated with silicosis is development of

pulmonary tuberculosis (silico-tuberculosis). Respiratory insufficiencies due to massive fibrosis and reduced pulmonary function, possibly with accompanying heart failure, are other potential causes of death due to silicosis.

Symptoms of Silicosis: Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis can be progressive, and symptoms may potentially appear years after exposures have ceased. Symptoms of silicosis may include (but are not limited to), Shortness of breath; difficulty breathing with or without exertion; coughing; diminished work capacity; diminished chest expansion; reduction of lung volume; heart enlargement and/or failure. Respirable dust containing newly broken particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken pieces of silica.

There are reports in the literature indicating that crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune and immunity-related disorders. Several studies of persons with silicosis or silica exposure also indicate or suggest increased risk of developing lung cancer, a risk that may increase with the duration of exposure. Many of these studies of silicosis do not account for lung cancer confounders, especially smoking. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as a human carcinogen (Group 1 carcinogen). The NTP indicates that crystalline silica is reasonably anticipated to be a human carcinogen (Group 2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and epidemiological studies of workers exposed to crystalline silica. Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as a chemical known to the state to cause cancer or reproductive toxicity.

Aluminum Oxide:

Exposure route: Eyes, skin, inhalation.

Target organs: Eyes, skin, respiratory system.

Acute effect: Animal studies with α -alumina were reported in 1941. This study found that alumina particles well below 40 μm in diameter produced a "nuisance particulate" reaction in animals. Very fine Al₂O₃ powder was not fibrogenic in rats, guinea pigs, or hamsters when inhaled for 6 to 12 months and sacrificed at periods up to 12 months following the last exposure.

Chronic effect/carcinogenicity: Aluminum oxide is not classifiable as to human carcinogen potential. Epidemiologic surveys have indicated an excess of nonmalignant respiratory disease in workers exposed to aluminum oxide during abrasives production.

Ferric Oxide:

Exposure route: Inhalation.

Target organs, Respiratory system.

Acute effect Benign pneumoconiosis with X-ray shadows indistinguishable from fibrotic pneumoconiosis. Experimental work in animals exposed by intratracheal injection or by inhalation to iron oxide mixed with less than 5% silica has shown no evidence of fibrosis produced in lung tissue.

Chronic effect/carcinogenicity: It is not generally accepted that inhalation or dermal exposure to iron oxide dust or fume poses a carcinogenic risk to human beings. Not classifiable as to human carcinogen potential.

Ferrous Oxide:

Exposure route: Ingestion, inhalation, skin.

Target organs: Respiratory system, skin, eyes, neurological system.

Acute effect: Major findings: stupor, shock, acidosis, bemaatemesis, bloody diarrhea or coma.

Minor findings: vomiting, diarrhea, mild lethargy.

Chronic effect/carcinogenicity: Irritability, nausea or vomiting, and normocytic anemia. When exposed to levels greater than 50 to 100 milligram per day, it can result in pathological deposition of iron in the body tissues causing fibrosis of the pancreas, diabetes mellitus, and liver cirrhosis. Not classifiable as to human carcinogen potential.

Magnesium Oxide:

Exposure route: Inhalation, eye/skin contact.

Target organs: Eyes, respiratory system.

Acute effect: Magnesium oxide dust caused slight irritation of the eyes and nose, conjunctivitis, inflammation of the mucous membrane, and coughing up discolored sputum after industrial exposures amongst workers exposed to an unspecified concentration of MgO. Acute toxicity causes nausea, malaise, general depression and paralysis of respiratory, cardiovascular and central nervous system.

Experiments with cats exposed to freshly formed MgO (magnesium ranging from 2 l to 156 mg) fumes plus 10% carbon dioxide showed uniform but slight hypothermia. These animals rapidly returned to normal and showed no subsequent ill effect upon cessation of MgO inhalation.

Chronic effect/carcinogenicity: NIOSH has indicated that there may be a carcinogenic risk from exposure to MgO dust.

Calcium Oxide:

Exposure route: Inhalation, eye/skin contact.

Target organs: Eyes, respiratory system.

Acute effect: Direct contact of CaO with tissues can result in burns and severe irritation because of its high reactivity and alkalinity. Major complaints of workers exposed to lime consist of irritation of the skin and eyes, although inflammation of the respiratory passages, ulceration and perforation of the nasal septum, and even pneumonia has been attributed to inhalation of the dust.

Chronic effect/carcinogenicity: Not classifiable as to human carcinogen potential.

Sodium Oxide:

Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: Corrosive - causes burns, irritation of skin, eyes, respiratory tract, extremely destructive of mucous membranes. Chronic effect/carcinogenicity: Not classifiable as to human carcinogen potential.

Potassium Oxide

Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin, respiratory system.

Acute effect: If inhaled, causes sore throat, cough, burning sensation, and shortness of breath.

Contact with skin produces pain and blisters. Severe deep burns, redness, and pain occur with eye

contact. Ingestion of K₂O results in burning sensations, abdominal pain, shock, or collapse.

Chronic effect/carcinogenicity: Not classifiable as to human carcinogen potential.

Titanium Oxide:

Exposure route: inhalation

Target organs: respiratory system.

Acute effect: Toxicological studies have concluded that titanium oxide is inert, not absorbed by the body, and exerts no toxic effect.

Chronic effect/carcinogenicity: Not classifiable as to human carcinogen potential. (In consideration by IARC to be classified as Group 2B-possibly carcinogenic to humans.)

11.0 Ecological Information

Ecotoxicity:

No data available for this product.

Environmental Fate:

No data available for this product.

12.0 Spill Disposal Considerations

Waste Disposal Method:

Collect and reuse clean materials. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

Steps to be taken in case of spills: Not Applicable

Waste Disposal Method: Not Applicable

13.0 Transportation Information

DOT Hazard Classification: None

Placard Required: None

Label as required by the OSHA Hazard
Label Required: Communication Standard {29 CFR 1910.1200(f)},
and applicable state and local regulations

14.0 Regulatory Information

Crystalline silica, a major component of this product, is on the NTP and IARC carcinogen lists, but not on the OSHA carcinogen list. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as a human carcinogen (Group I carcinogen).

Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as chemical known to the state to cause cancer or reproductive toxicity.

Key/Legend – Other Information

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; 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; CAA = Clean Air Act; CFR = US Code of Federal Regulations; DOT = US Department of Transportation; IDLH = International Agency for Research on Cancer; NTP = National Toxicology Program; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; TWA = Time-weighted Average

Buechel Stone Corporation does not assume any liability for personal injury/illness or property damage for use with this product. The information provided in this MSDS is accurate based upon current analytical findings as received from the stone quarry that provided the natural stone material.