COPPS INDUSTRIES, INC.
An ISO 9001 Certified Company

10500 N. Commerce Street
Mequon, WI 53092-4473
262-238-1700 (Tel.)
262-238-1701 (Fax)
www.coppsindustries.com

Technical Bulletin

# REDBAC Deep Pour 3CE Grout- K-028

**Description:**

REDBAC Deep Pour 3CE Grout is a three component, 100 % solids, VOC and BGE[1] free, epoxy resin system designed specifically for pours up to 8" (20.3 cm). Deep Pour 3CE offers rapid strength development, excellent flow characteristics, and minimal shrinkage. Deep Pour 3CE flows into spaces under machines, fills completely before solidifying and is self-leveling. It will survive impact and vibration equal to reinforced rubber materials and will not delaminate under the most severe shock loads.

**Intended Use:**

- Deep grouting of large machine bases
- Setting large leveling wedges
- Setting large sole plates
- Deep repairs in foundations
- Concrete alternative for critical machine settings
- Economical large volume applications

**Application Guidelines:**

The working time (the time you have before it sets) of this grout will vary according to the air temperature. The average working time at 72 °F (22 °C) will be 45 minutes. In cooler weather you will have more time to pour material and in hotter weather you will have less time.

The cure time (the time before the grout is strong enough for use) will also depend on the air temperature and the temperature of the floor and machinery being grouted. The average cure time from the last pour to machinery start-up will be 24 hours at 72 °F (22 °C). In cool weather, the grout will cure and develop strength more slowly than in hot weather. Remember that the temperature of the foundation concrete must be taken into account along with the air temperature when assessing the cure time needed.

**Handling Properties:**

| | | | | | |
|---|---|---|---|---|---|
| MAXIMUM DEPTH OF POUR, in. (cm) | 8 | (20.3) | | | |
| WORKING TIME, min | 45 | | | | |
| GEL TIME | | | | | ASTM D 2471 |
| @ 50 °F (10 °C) | 8-10h | | | | |
| @ 72 °F (22 °C) | 90 min | | | | |
| @ 90 °F (32 °C) | 60 min | | | | |

**Physical Properties:**

| | **Standard** | | **High Flow** | | |
|---|---|---|---|---|---|
| PEAK EXOTHERM (1 lb or 454g mass), °F (°C) | 82 | (28) | 88 | (31) | ASTM D 2471 |
| SPECIFIC GRAVITY, g/ $cm^3$ | 2.19 | | 2.14 | | ASTM D 792 |
| | **Standard (5 Bag)** | | **High Flow (4 Bag)** | | |
| COMPRESSIVE STRENGTH, psi (MPa) | | | | | ASTM C 579 |
| 1 day | 14,500 | (100) | 14,570 | (101) | |
| 3days | 15,300 | (106) | 16,530 | (114) | |
| 7days | 15,900 | (110) | 16,860 | (116) | |
| 28 days | 16,200 | (112) | 17,340 | (120) | |
| TENSILE STRENGTH, psi (MPa) | 2,900 | (20) | 2,950 | (20) | ASTM D 638 |
| FLEXURAL STRENGTH, psi (MPa) | 6,300 | (43) | 6,600 | (46) | ASTM D 790 |
| HEAT DISTORTION TEMPERATURE, °F (°C) | 136 | (58) | 136 | (58) | ASTM D 648 |
| MAX CONTINUOUS SERVICE TEMPERATURE, °F (°C) (for non load-bearing applications) | 250 | (121) | 250 | (121) | |
| COEFFICIENT OF THERMAL EXPANSION, $10^{-6}$ /°F | 16.6 | | 16.1 | | ASTM C 531 |
| EARLY-AGE HEIGHT CHANGE, % | 1.02 | | 3.66 | | ASTM C 827 |
| EFFECTIVE BEARING AREA, % | ≥95 | | ≥95 | | ASTM C 1339 |
| CREEP, | | | | | ASTM C 1181 |
| (@400 psi, @70 °F), in./in. or cm/cm | 0.74 x 10-3 | | 0.50 x 10-3 | | |
| (@400 psi, @140 °F), in./in. or cm/cm | 4.8 x 10-3 | | 3.6 x 10-3 | | |
| BOND TO CONCRETE (concrete failure), psi (MPa) | 4,000 | (27.6) | 3,600 | (24.8) | ASTM C 882 |
| ADHESION TO STEEL (clean, sandblasted), psi (MPa) | 2,500 | (17.2) | 2,500 | (17.2) | ASTM D 4541 |
| HARDNESS, Shore D | 92 | | 93 | | ASTM D 2240 |
| WATER ABSORPTION % | | | | | ASTM D 570 |
| 28 day immersion @ 72 °F or 22°C | 0.15 | | 0.25 | | |

1 - Butyl Glycidyl Ether. The EPA (SARA Title III, section 312) lists BGE as “Toxic” (per ANSI Z129.1) by skin absorption and an immediate health hazard.

**Surface Preparation:**

**CONCRETE PREPARATION:** Remove all oil, grease, or contaminated concrete. Chip the surface down to sound aggregate. The concrete must be **dry** and have no water in the anchor bolt holes. Light acid etching surface preparation procedures may result in poor bond and should be avoided. Do not prime or seal concrete surfaces.

**FORMING:** Standard wood or metal forming may be used. The forms should be protected with heavy coats of paste wax, grease, or form release agent. Wrapping the forms with heavy plastic is acceptable. The forms must be caulked and sealed to a liquid-tight condition.

When placing forms for grouting, it is absolutely necessary that the top of the forms be at least half way up the sides of the base plate or machine base. Placing the grout just to the bottom of the base plate will result in an improper grout job. If the forms cannot be placed half way up the side of the machine base, the minimum distance is 3/4 inch (1.9 cm) above the bottom of the machine base.

The forms should be placed between 2 and 6 inches (5.08 and 15.24 cm) away from the perimeter of the machine base to allow for the air to escape and to provide for a grout shoulder around the base plate.

**PREPARATION OF METAL SURFACES:** Base plates or sole plates to be grouted should be sand blasted to a "white metal" condition. If it is impossible to grout within 24 hours of sand blasting, the surfaces should be primed with a high-quality primer. Do not use porch and deck enamel or red-lead primer.

**Application:**

Working time/pouring time will depend on grout temperature and ambient temperature. The average working time, at 72 °F (22 °C) is 45 minutes. Pouring time and viscosity decrease as temperature increases. Care should be taken to insure that the entire kit is poured before the working time elapses. In other words, do not mix more than you can pour during the working time.

Always sweep (pour) from one side of the base toward the other to eliminate entrapped air. The storage temperature of the unmixed kits of grout will greatly affect both the ease of pouring and the cure time. For best results, grout kits should be stored in a warm room for at least 24 hours before use.

During cold weather (below 50 °F or 10 °C), it is important that the foundation be enclosed and maintained above 50 °F or 10 °C. The cure time of the grout will be longer during cold weather and it is important that the grouted area be kept warm (above 50 °F or 10 °C) until the grout has cured completely. Do not pour if the grout is below 50 °F (10 °C). Conversely in hot weather, do not mix and pour in direct sunlight. Cover or “tent” operations to prevent grout from setting up too fast, which usually leads to excessive shrinkage and/or cracking.

**Packaging:**

REDBAC Deep Pour 3CE Grout is a three component system that includes five bags of aggregate for a unit yield of approximately 2.0 cubic feet (273lb kit). If higher flow is required one bag of aggregate may be put aside (4 bag) for a unit yield of approximately 1.7 cubic feet.

Standard K-028-54: 682 $in.^3$ = 0.4 $ft.^3$, approximately (11,327 $cm^3$)
Standard K-028-273: 3446 $in.^3$ = 2.0 $ft.^3$, approximately (0.06 $m^3$)
High Flow K-028-225: 2937$in^3$ = 1.7$ft.^3$, approximately (0.048$m^3$)

**SAFETY PRECAUTIONS**

Avoid breathing of vapors. Forced local exhaust is recommended to effectively minimize exposure. NIOSH approved, organic vapor respirators and forced exhaust are recommended in confined areas, or when conditions (such as heated polymers, sanding) may cause high vapor concentrations. **DO NOT WELD ON, BURN OR TORCH ON OR NEAR, ANY EPOXY MATERIAL. HAZARDOUS VAPOR IS RELEASED WHEN AN EPOXY IS BURNED.**

## *FOR INDUSTRIAL USE ONLY*

### WARRANTY AND DISCLAIMER

Copps Industries, Inc. gives no warranty, express or implied, and all products are sold upon condition that purchasers will make their own tests to determine the quality and suitability of the product. Copps Industries, Inc. shall be in no way responsible for the proper use and service of the product. The information given in this publication is considered to be accurate and reliable and is provided as a service only. Physical properties shown are typical. Actual properties are dependent on curing conditions and degree of cure. Any information or suggestions given are without warranty of any kind and purchasers are solely responsible for any loss arising from the use of such information or suggestions. No information or suggestions given by us shall be deemed to be a recommendation to use any product in conflict with any existing patent rights.

TB#4028

(05/08/17)

## 1 Identification of the substance/mixture and the

**Trade name:** Deep Pour Resin

**1.2 Application of the substance / the mixture:** Epoxy binder

**1.3 Details of the supplier of the Safety Data Sheet**
**Manufacturer/Supplier:**

Copps Industries, Inc.
10600 N. Industrial Drive
Mequon, WI 53092
Phone: (262) 238-1700

**1.4 Emergency telephone number:**
ChemTel Inc.
(800) 255-3924, +1 (813) 248-0585

## 2 Hazards identification

Skin Irritant 2; H315: Causes skin irritation.
Eye Irritant 2; H319: Causes serious eye irritation.
Skin Sensitizer 1; H317: May cause and allergic skin reaction.

**2.2 GHS Label elements**

**Hazard pictograms/symbols**

**Signal word:** Warning

**Hazard statements:**
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H317: May cause and allergic skin reaction.

**Precautionary statements:**
P280: wear protective gloves / eye protection.
P273: Avoid release to the environment.
P264: Wash thoroughly after handling.
P261: Avoid breathing mist/vapours/spray.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do .Continue rinsing.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
P337+P313: If eye irritation persists: Get medical advice/attention.

**Additional information:** Contains epoxy constituents. May produce an allergic reaction.

**HMIS Rating:**

| | |
|---|---|
| Health: | 2 |
| Flammability: | 1 |
| Physical Hazard: | 0 |

## 3 Composition/information on ingredients

**Description:** Mixture of substances listed below with nonhazardous additions.

| Dangerous components: | | |
|---|---|---|
| CAS: 25068-38-6 | Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin (number average molecular weight≤700) | 60-90% |
| Trade Secret | Glycidyl ether | 10-20% |

In conformity with 29CFR 1910.1200(i) the specific chemical identity may be withheld as Trade Secret, while all health/safety properties and effects are included in the SDS.

## 4 First aid measures

**4.1 Description of first aid measures**
**General information:** Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident. Take affected persons out into the fresh air.
**After inhalation:** Supply fresh air**;** consult doctor in case of complaints.
**After skin contact:** Immediately rinse with water. If skin irritation continues, consult a doctor.
**After eye contact:** Remove contact lenses if worn, if possible. Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor**.**
**After swallowing:** Rinse out mouth and then drink plenty of water. Do not Induce vomiting; call for medical help immediately.
**4.2 Most important symptoms and effects, both acute and delayed:** Allergic reactions, Nausea, Coughing, Gastric or intestinal disorders, Irritant to skin and mucous membranes, Irritant to eyes.
**4.3 Indication of any immediate medical attention and special treatment needed:** Contains reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight ≤ 700). May produce an allergic reaction. If necessary oxygen respiration treatment. Later observation for pneumonia and pulmonary edema. Medical supervision for at least 48 hours.

## 5 Firefighting measures

**5.1 Extinguishing media**
**Suitable extinguishing agents:** Water haze or fog, Foam, Fire-extinguishing powder, Carbon dioxide.
**For safety reasons unsuitable extinguishing agents:** Water with full jet**,** Water spray
**5.2 Special hazards arising from the substance or mixture:** Formation of toxic gases is possible during heating or in case of fire.
**5.3 Advice for the firefighters**
**Protective equipment:** Wear self-contained respiratory protective device, Wear fully protective suit.
**Additional information:** Cool endangered receptacles with water fog or haze, Eliminate all ignition sources if safe to do so.

## 6 Accidental release measures

**6.1 Personal precautions, protective equipment and emergency procedures:** Use respiratory protective device against the effects of fumes/dust/aerosol. Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.
**6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water. Inform respective authorities in case of seepage into water course or sewage system. Prevent from spreading (e.g. by damming–in or oil barriers).
**6.3 Methods and material for containment and cleaning up:** Absorb liquid components with liquid-binding material. Send for recovery or disposal in suitable receptacles. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

## 7 Handling and storage

**7.1 Precautions for safe handling:** Use only in well ventilated areas. Store in cool, dry place in tightly closed receptacles (60-80ºF recommended).
**7.2 Conditions for safe storage, including any incompatibilities:**Use only receptacles specifically permitted for this substance/product. Avoid storage near extreme heat, ignition sources or open flame.
**Further Information about storage conditions:** Keep container tightly sealed. Store in an area with adequate ventilation

## 8 Exposure controls/personal protection

**8.1 Control parameters**
**Ingredients with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
**DNELs:** No further relevant information available.
**PNECs:** No further relevant information available.
**Additional information:** The lists valid during the making were used as basis.

**8.2 Engineering controls** Provide readily accessible eye wash stations and safety showers. Provide ventilation adequate to ensure concentrations are minimized.

**8.3 Personal protective equipment**

**General protective and hygienic measures:** Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin.

**Respiratory protection:** Not required under normal conditions of use. Use suitable respiratory protective device in case of insufficient ventilation. For spills, respiratory protection may be advisable.Use respiratory protection when grinding or cutting material.

**Hand protection:** Protective, impervious gloves. (Neoprene, PVC, Nitrile rubber) The glove material has to be impermeable and resistant to the product / the substance/ the preparation. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

**Eye protection:** Safety glasses with side shields. Contact lenses should not be worn.

**Skin and Body protection:** Protective work clothing. Where potential exposure warrants, rubber or plastic boots and chemically resistant protective suit.

## 9 Physical and chemical properties

**9.1 Information on basic physical and chemical properties**

**General Information**

**Appearance**

| | |
|---|---|
| **Form:** | Liquid |
| **Colour:** | Colorless |
| **Odour:** | Sweet |
| **Odour threshold:** | No data available |
| **pH:** | No data available |
| **Melting point/range:** | No data available |
| **Boiling point/range:** | >392 °F / >200 °C |
| **Flash point:** | >302 °F / >150 °C |
| **Evaporation rate:** | No data available |
| **Flammability (solid, gaseous):** | Not applicable |
| **Upper/lower flammability or explosive limit:** | Not applicable |
| **Vapor pressure:** | No data available |
| **Vapor density:** | No data available |
| **Relative Density at 20°C:** | 1.12g/cm³ |
| **Solubility in / Miscibility with Water:** | Not miscible or difficult to mix. |
| **Partition coefficient (n-octanol/water):** | No data available |
| **Auto/Self-ignition temperature:** | No data available |
| **Decomposition temperature:** | No data available |
| **Viscosity** | 900 – 1,400 cps |

## 10 Stability and reactivity

**10.1 Reactivity**

**10.2 Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions:** Reacts with strong alkali. Exothermic polymerization. Reacts with strong acids and oxidizing agents. Reacts with catalysts.

**10.4 Conditions to avoid:** Avoid contact with strong oxidizing agents, excessive heat or flames.

**10.5 Incompatible materials:** Strong acids, bases and oxidizing agents.

**10.6 Hazardous decomposition products:** Carbon monoxide and carbon dioxide.

## 11 Toxicological information

**11.1 Information on likely routes of exposure:**

Inhalation: May cause respiratory irritation
Ingestion: No data
Skin contact: May cause skin irritation
Eye contact: May cause eye irritation

**11.2 Symptoms related to physical, chemical and toxicological characteristics:** No available data

**11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:**

(Data for primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)

Acute toxic:

| | |
|---|---|
| Oral | LD50 > 2,000 mg/kg (rat) |
| Dermal | LD50 > 2,000 mg/kg (rat) |
| Inhalation | No data |

Skin Corrosive/irritant:

Test material was slightly irritating to skin in key studies. For the skin, mean erythema and edema scores were 0.8 and 0.5 respectively.

Serious eye damage/eye irritation:

Test material was slightly irritating to the eye in key studies. The mean eye score was 0.4

Respiratory sensitization: No data available

Skin sensitization:

In a local lymph node assay, the concentration that would cause a 3-fold increase in proliferation (EC-3) was calculated to be 5.7% which is consistent with moderate dermal sensitization potential.

**11.4 Numerical measures of toxicity:** No data available for mixture**.**

**Additional toxicological information:** The product shows, the following dangers according to the calculation method of the General EU, Classification Guidelines for Preparations as issued in the latest version: Irritant**,** Danger through skin absorption. Toxic and /or corrosive effects may be delayed up to 24 hours, Inhalation of concentrated vapours as well as oral intake will lead to anesthesia-like conditions and headache, dizziness, etc.

## 12 Ecological information

**12.1 Toxicity**

**Aquatic toxicity:**

(Data taken from SDS of primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)

| | |
|---|---|
| Fish | 96hr-LC50 = 3.6mg/L test mat. *Oncorhynchus mykiss* (direct application, nominal) (OECD Guideline 203) |
| | LC50 1.41 mg/L 96hr *Oryzias latipes* |
| Crustacea | 48hr-EC50 = 2.8mg/L test mat *Daphnia magna* (direct application, nominal, based on: mobility) (OECD Guideline 202) |
| | EC50 1.7mg/L 48hr |
| Aquatic Plant | 72hr-EC50 > 11 mg/L *Scenedesmus capricornutum* water soluble fraction (meas. (arithm. mean)) based on: growth rate (EPA-660/3-75-009) |

**12.2 Persistence and degradability:** No data available.

**12.3 Bioaccumulative potential:** No further relevant information available.

**12.4 Mobility in soil:** No further relevant information available.

**12.5 Results of PBT and vPvB assessment:**

**PBT:** Not applicable.

**vPvB:** Not applicable.

**12.6 Other adverse effects:** No further relevant information available

## 13 Disposal considerations

**13.1 Waste treatment methods**

**Waste from residue/unused product:** This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations

**Contaminated packaging:** Disposal must be made in accordance with official federal, state and local regulations.

## 14 Transport information

### DOT

**UN number:** Not Regulated

### IATA

**UN number:** Not Regulated

### IMDG

**UN number:** Not Regulated

### TDG

**UN number:** Not Regulated

## 15 Regulatory Information

**United States (USA)**

**SARA**

| |
|---|
| **Section 355 (extremely hazardous substances):** |
| None of the ingredients is listed. |
| **Section 313 (Specific toxic chemical listings):** |
| Component(s) above 'de minimus' level: None |
| **TSCA (Toxic Substances Control Act):** |
| All the ingredients are listed. |

**Proposition 65 (California):**

| |
|---|
| **Chemicals known to cause cancer:** None |

**Canada**

| |
|---|
| **Canadian Domestic Substances List (DSL):** |
| All ingredients are listed. |
| **Canadian Ingredient Disclosure list (limit 0.1%)** |
| None of the ingredients is listed. |
| **Canadian Ingredient Disclosure list (limit 1%)** |
| None of the ingredients is listed. |

**15.2 Chemical Safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

**Abbreviation and acronyms:**
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienist.
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substance
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)

## 1 Identification of the substance/mixture and the

**Trade name:** Deep Pour Hardener

**1.2 Application of the substance / the mixture:** Epoxy grout

**1.3 Details of the supplier of the Safety Data Sheet**
**Manufacturer/Supplier:**

Copps Industries, Inc.
10600 N. Industrial Drive
Mequon, WI 53092
Phone: (262) 238-1700

**1.4 Emergency telephone number:**
ChemTel Inc.
(800) 255-3924, +1 (813) 248-0585

## 2 Hazards identification

Acute Toxicity – Oral; Category 4
Acute Toxicity – Dermal; Category 4
Skin Corrosion; Category 1B
Serious Eye Damage; Category 1
Skin Sensitization; Category 1
Reproductive Toxicity; Category 2
Specific Target Organ Toxicity – single exposure; Category 3
Aquatic Hazard (Acute) – Category 3

**2.2 GHS Label elements**

**Hazard pictograms/symbols**

**Signal word:** Danger

**Hazard statements:**
H302+H312: Harmful if swallowed or in contact with skin.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H402: Harmful to aquatic life.

**Precautionary statements:**
P201: Obtain special instructions before use.
P260: Do not breath dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P281: Use personal protective equipment as required
P301+P330+P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P304+340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310: Immediately call a POISON CENTRE or doctor/physician.
P403+P233: Store in a well-ventilated place. Keep container tightly closed.
**Additional information:** This product contains a component that is toxic by inhalation when aerosolized or sprayed. Please refer to Sections 11 for toxicity information. If product is not being aerosolized or sprayed, the inhalation toxicity may not be applicable.

**HMIS Rating:**

Health: 3
Flammability: 1
Physical Hazard: 0

## 3 Composition/information on ingredients

**Description:** Mixture of substances listed below with potential nonhazardous additions.

| **Dangerous components:** | | |
|---|---|---|
| Trade Secret | Aliphatic amine adduct | 50-70% |
| CAS: 112-24-3 | Triethylenetetramine | 10-25% |
| CAS: 111-40-0 | Diethylenetriamine | 10-25% |
| CAS: 80-05-7 | Phenol, 4,4'-(1-methylethylidene)bis- | 5-15% |
| Trade Secret | Polyetheramine | <10% |

In conformity with 29CFR 1910.1200(i) the specific chemical identity may be withheld as Trade Secret, while all health/safety properties and effects are included in the SDS.

## 4 First aid measures

**4.1 Description of first aid measures**
**General information:** Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately
**After inhalation:** Supply fresh air; consult doctor in case of complaints.
**After skin contact:** Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Take off contaminated clothing and shoes immediately.
**After eye contact:** Rinse immediately with plenty of water for at least 15 minutes. If symptoms persist, consult a doctor.
**After ingestion:** Never give anything by mouth to an unconscious person. Prevent aspiration of vomit. Turn victim's head to the side. Do not Induce vomiting; call for medical help immediately.
**4.2 Most important symptoms and effects, both acute and delayed:** Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders, skin disorders and allergies.
**4.3 Indication of any immediate medical attention and special treatment needed:** Contains Phenol, 4,4'-(1-methylethylidene)bis-. May cause an allergic reaction.

## 5 Firefighting measures

**5.1 Extinguishing media**
**Suitable extinguishing agents:** Foam. Fire-extinguishing powder. Carbon dioxide.
**5.2 Specific hazards arising from the substance or mixture:** May generate ammonia gas. May generate toxic nitrogen oxide gases. Burning produces noxious and toxic fumes. Downwind personnel must be evacuated.
**5.3 Advice for the firefighters**
**Protective equipment:** Wear self-contained respiratory protective device. Wear fully protective suit.
**Additional information:** Cool endangered receptacles with water fog or haze. Eliminate all ignition sources if safe to do so.

## 6 Accidental release measures

the effects of fumes/dust/aerosol. Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.
**6.2 Environmental precautions:** Do not allow to enter sewers/surface or ground water. Inform respective authorities in case of seepage into water course or sewage system. Prevent from spreading (e.g. by damming–in or oil barriers).
**6.3 Methods and material for containment and cleaning up:** Send for recovery or disposal in suitable receptacles. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

## 7 Handling and storage

(60-80ºF recommended).
**7.2 Conditions for safe storage, including any incompatibilities:** Use only receptacles specifically permitted for this substance/product. Avoid storage near extreme heat, ignition sources or open flame.

**Further Information about storage conditions:** Keep container tightly sealed. Store in an area with adequate ventilation.

## 8 Exposure controls/personal protection

**Exposure Limits:**

| | | | |
|---|---|---|---|
| Triethylenetetramine | Time Weighted Average (TWA): WEEL | 1 ppm | 6 mg/m3 |
| Diethylenetriamine | Time Weighted Average (TWA):ACGIH | 1 ppm | ---------- |
| Diethylenetriamine | Recommended Exposure Limit (REL): NIOSH | 1 ppm | 4 mg/m3 |
| Diethylenetriamine | Time Weighted Average (TWA):OSHA Z1A | 1 ppm | 4 mg/m3 |
| Diethylenetriamine | Time Weighted Average (TWA): Permissible Exposure Limit (PEL): US CA OEL | 1 ppm | 4 mg/m3 |
| Diethylenetriamine | Time Weighted Average (TWA): TN OEL | 1 ppm | 4 mg/m3 |

**8.2 Engineering controls** Provide readily accessible eye wash stations and safety showers. Provide ventilation adequate to ensure concentrations are minimized.

**8.3 Personal protective equipment**

**General protective and hygienic measures:** Keep away from foodstuffs, beverages and feed. Immediately remove all soiled and contaminated clothing. Wash hands before breaks and at the end of work. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin.

**Respiratory protection:** Not required under normal conditions of use. Use suitable respiratory protective device in case of insufficient ventilation. For spills, respiratory protection may be advisable. Use respiratory protection when grinding or cutting material.

**Hand protection:** Protective, impervious gloves. (Neoprene, Butyl-rubber, Nitrile rubber) The glove material has to be impermeable and resistant to the product / the substance/ the preparation. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation.

**Eye protection:** Face shield with safety glasses or goggles underneath.Contact lenses should not be worn.

**Skin and Body protection:** Protective work clothing. Where potential exposure warrants, rubber or plastic boots and chemically resistant protective suit.

## 9 Physical and chemical properties

**General Information**

**Appearance**

| | |
|---|---|
| **Form:** | Liquid |
| **Colour:** | Blue |
| **Odour:** | Amine |
| **Odour threshold:** | No data available |
| **pH:** | Alkaline |
| **Melting point/range:** | No data available |
| **Boiling point/range:** | >392 °F / >200 °C |
| **Flash point:** | >212 °F / >100 °C |
| **Evaporation rate:** | No data available |
| **Flammability (solid, gaseous):** | Not applicable |
| **Upper/lower flammability or explosive limit:** | Not applicable |
| **Vapor pressure:** | No data available |
| **Vapor density:** | No data available |
| **Relative Density at 20°C:** | 1.00 g/cm³ |
| **Solubility in / Miscibility with Water:** | Not miscible or difficult to mix. |
| **Partition coefficient (n-octanol/water):** | No data available |
| **Auto/Self-ignition temperature:** | No data available |
| **Decomposition temperature:** | No data available |
| **Viscosity** | 200 – 400 cps |

## 10 Stability and reactivity

**10.2 Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions:** Reacts with strong alkali, Exothermic polymerization, Reacts with strong acids and oxidizing agents, Reacts with catalysts.
**10.4 Conditions to avoid:** Avoid contact with strong oxidizing agents, excessive heat or flames.
**10.5 Incompatible materials:** Strong acids, bases and oxidizing agents.
**10.6 Hazardous decomposition products:** Nitric acid, Ammonia, Nitrogen oxides (NOx), Nitrogen oxide can react with water vapors to form corrosive nitric acid, Carbon monoxide, Carbon dioxide ($CO_2$), Aldehydes, Flammable hydrocarbon fragments.

## 11 Toxicological information

**11.1 Information on likely routes of exposure:**

Skin contact: Harmful in contact with skin. Causes skin burns.
Eye contact: Causes eye burns.
Ingestion: Harmful if swallowed. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Inhalation: This product contains a component that is toxic by inhalation when aerosolized or sprayed. If product is not being aerosolized or sprayed, the inhalation toxicity may not be applicable. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system. Inhalation of aerosol may cause irritation to the upper respiratory tract. May cause nose, throat, and lung irritation. Can cause severe eye, skin and respiratory tract burns.

**11.2 Symptoms related to physical, chemical and toxicological characteristics:** Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders, skin disorders and allergies.
**11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:** This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. May cause allergic skin reaction. This product may cause adverse reproductive effects. Asthma, Eye disease, Kidney disorders, Liver disorders, Skin disorders and Allergies.
**11.4 Numerical measures of toxicity:** No data is available for full mixture**.**

| | | | |
|---|---|---|---|
| Diethylenetriamine | CAS 111-40-0 | Oral LD50 | 1080 mg/kg (rat) |
| | | Dermal LD50 | 1090 mg/kg (rabbit) |
| Phenol, 4,4'-(1-methylethylidene) bis- | CAS 80-05-7 | Oral LD50 | 3250 mg/kg (rat) |
| | | Dermal LD50 | 3000 mg/kg (rabbit) |
| Polyetheramine | CAS 9046-10-0 | Oral LD50 | >2800 mg/kg (rat) |
| | | Dermal LD50 | >2800 mg/kg (rabbit) |

## 12 Ecological information

**12.1 Aquatic toxicity:** No data available on the product itself.
**12.2 Persistence and degradability:** No data available on the product itself.
**12.3 Bioaccumulative potential:** No data available on the product itself.
**12.4 Mobility in soil:** No data available.
**12.5 Other adverse effects:** No further relevant information available.

## 13 Disposal considerations

**13.1 Waste treatment methods**
**Waste from residue/unused product:** This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations
**Contaminated packaging:** Disposal must be made in accordance with official federal, state and local regulations.

## 14 Transport information

**DOT**

**UN number:** UN2735
**Proper Shipping Name:** AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyetheramine)
**Hazard Class:** 8
**Packing Group:** II
**Labels(s):** 8
**Marine Pollutant:** No

**IATA**

**UN number:** UN2735

**Proper Shipping Name:** AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyetheramine)
**Hazard Class:** 8
**Packing Group:** II
**Labels(s):** 8
**Marine Pollutant:** No

**IMDG**

**UN number:** UN2735
**Proper Shipping Name:** AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyetheramine)
**Hazard Class:** 8
**Packing Group:** II
**Labels(s):** 8
**Marine Pollutant:** No

**TDG**

**UN number:** UN2735
**Proper Shipping Name:** AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyetheramine)
**Hazard Class:** 8
**Packing Group:** II
**Labels(s):** 8
**Marine Pollutant:** No

## 15 Regulatory Information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Toxic Substance Control Act (TSCA) 12(b) Component(s): None.

| Country | Regulatory list | Notification |
|---|---|---|
| USA | TSCA | Included on Inventory. |
| EU | EINECS | Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer. |
| Canada | DSL | Included on Inventory. |
| Australia | AICS | Included on Inventory. |
| Japan | ENCS | Included on Inventory. |
| South Korea | ECL | Included on Inventory. |
| China | SEPA | Included on Inventory. |
| Philippines | PICCS | Included on Inventory. |

**SARA**

| |
|---|
| **Section 355 (extremely hazardous substances):** |
| None of the ingredients is listed. |
| **Section 313 (Specific toxic chemical listings):** |
| Component(s) above 'de minimus' level: Phenol, 4,4'-(1-methylethylidene)bis- |
| **TSCA (Toxic Substances Control Act):** |
| All the ingredients are listed. |

**Proposition 65 (California):**

| |
|---|
| **Chemicals known to cause cancer or reproductive toxicity:** Phenol, 4,4'-(1-methylethylidene)bis- |

**15.2 Chemical Safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

features and shall not establish a legally valid contractual relationship.

**Abbreviation and acronyms:**
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienist.
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substance
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)

## 1 Identification of the substance/mixture and the

**1.1 Product identifier**
**Trade name:** Deep Pour Aggregate Blend

**1.2 Application of the substance / the mixture:** Epoxy Aggregate Filler

**1.3 Details of the supplier of the Safety Data Sheet**
**Manufacturer/Supplier:**

Copps Industries, Inc.
10600 N. Industrial Drive
Mequon, WI 53092
Phone: (262) 238-1700

**1.4 Emergency telephone number:**
ChemTel Inc.
(800) 255-3924, +1 (813) 248-0585

## 2 Hazards identification

**2.1 GHS classification of the substance or mixture**

Category 1A Carcinogen
Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures
Category 2B Eye Irritation

**2.2 GHS Label elements**

**Hazard pictograms/symbols**

**Signal word:** Danger

**Hazard statements:**
H320: Causes eye irritation
H372: Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation.
H350: May cause cancer by inhalation

**Precautionary Statements:**
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P281: Use personal protective equipment as required.
P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 :IF exposed or concerned: Get medical advice/attention.

**Additional information:** Avoid creating dust when handling, using or storing. Use with adequate ventilation to keep exposure below recommended exposure limits. Wear eye protection and respiratory protection following this SDS, NIOSH guidelines and other applicable regulations. Dispose of contents/container in accordance with local, regional, national or international regulations**.** Please refer to Section 11 for details of specific health effects of crystalline silica.

## 3 Composition/information on ingredients

**3.2 Mixture**
**Description:** Substance listed below with potential nonhazardous additions.

| **Dangerous components:** | | |
|---|---|---|
| CAS: 14808-60-7 | Silica, Quartz, SiO2 | 50-100% |

## 4 First aid measures

**4.1 Description of first aid measures**
**After inhalation:** If gross inhalation of silica occurs, remove the person to fresh air, perform artificial respiration as needed and obtain medical attention as needed.
**After skin contact:** If abrasion occurs wash with soap and water and seek medical attention if irritation persists or develops later.
**After eye contact:** Immediately wash the eye with plenty of water for at least 15 minutes, while holding eyelid(s) open. If irritation persists, seek medical attention.
**After ingestion:** If gastrointestinal discomfort occurs, give a large quantity of water. Never attempt to make an unconscious person drink or vomit. Seek medical attention.
**4.2 Most important symptoms and effects, both acute and delayed:** There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough

and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

**4.3 Indication of any immediate medical attention and special treatment needed:** No information.

## 5 Firefighting measures

**5.1 Extinguishing Media:** Compatible with all media; use the medium appropriate to the surrounding fire.
**Unusual Fire and Explosion Habits:** None known.
**Special Fire Fighting Procedures:** None known.
**Hazardous Combustion Products:** None known.

## 6 Accidental release measures

Wear [illegible] rborne dust is present to ensure worker exposures remain below occupational exposure limits (Refer to Section 8). Follow respiratory protection selection guidelines as described in Section 8 of this document.

Collect the material using a method that does not produce dust such as a High-Efficiency Particulate Air (HEPA) vacuum or thoroughly wetting down the silica-containing dust before cleaning up. Place the silica-containing dust in a covered container appropriate for disposal. Dispose of the silica-containing dust according to federal, state and local regulations.

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

## 7 Handling and storage

Do not breathe dust, which may be created during the handling of this product. Do not rely on odor to determine whether respirable silica is present in the air, as it may be present without a visible cloud. Use good housekeeping procedures to prevent the accumulation of silica dust in the workplace. Avoid the creation of respirable dust.

Use adequate ventilation and dust collection equipment. Ensure that the dust collection system is adequate to reduce airborne dust levels to below the appropriate occupational exposure limits. If the airborne dust levels are above the appropriate occupational exposure limits, use respiratory protection during the establishment of engineering controls. Refer to Section 8 - Exposure Controls/Personal Protection for further information.

In accordance with OSHA's Hazard Communication Standard (29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59, 1928.21), state, and/or local right-to-know laws and regulations, familiarize your employees with this SDS and the information contained herein. Warn your employees, your customers and other third parties (in case of resale or distribution to others) of the potential health risks associated with the use of this product and train them in the appropriate use of personal protective equipment and engineering controls, which will reduce their risks of exposure.

See also ASTM International standard practice E 1132-06, "Standard Practice for Health Requirements Relating to Occupational Exposure to Respirable Crystalline Silica."

## 8 Exposure controls/personal protection

**8.1 Control parameters**

**Exposure Limits:**

Occupational Exposure Limits (respirable fraction) in air for dust containing crystalline silica (quartz):

| Standard | Exposure Limit |
|---|---|
| MSHA/OSHA PEL*<br>(8-Hour Time-Weighted Average) | 10 mg/m3 % SiO2+2 |
| ACGIH TLV**<br>(8-Hour Time-Weighted Average) | 0.025 mg/m3 |
| NIOSH REL**<br>(10-Hour Time-Weighted Average, 40-hour work week) | 0.05 mg/m3 |

* The OSHA/MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample. The OSHA/MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz).
** The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration.
The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. Refer to Section 10 for thermal stability information for crystalline silica (quartz).

Occupational Exposure Limits in air for inert/nuisance dust:

| Standard | Respirable Dust | Total Dust |
|---|---|---|
| MSHA/OSHA PEL<br>(as Inert or Nuisance Dust) | 5 mg/m3 | 15 mg/m3 |
| ACGIH TLV<br>(as Particles Not Otherwise Specified) | 3 mg/m3 | *10 mg/m3 |

Note: The limits for Inert Dust are provided as guidelines. Nuisance dust is limited to particulates not known to cause systemic injury or illness.
* The TLV provided is for inhalable particles not otherwise specified.

California Inhalation Reference Exposure Limit (REL): The California chronic REL for respirable crystalline silica (quartz, cristobalite, tridymite) is 3 ug/m3. [Dated December 18, 2008] A chronic REL is an airborne level of a chemical at or below which no adverse health effects are anticipated in individuals indefinitely exposed to that level. [Dated 2/10/05]

**8.2 Engineering controls** Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits. 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..

**8.3 Personal protective equipment**

**Respiratory protection:** Consult with OSHA regulations, Canadian CCOHS, NIOSH recommendations and other applicable regulatory agencies to determine the appropriate respiratory protection to be worn during use of this product, and use only such recommended respiratory protection equipment. Avoid breathing dust produced during the use and handling of this product. If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational exposure limits. Provisions should be made for a respiratory protection training program (see 29 CFR 1910.134 – Respiratory Protection for minimum program requirements). See also ANSI standard Z88.2 (latest revision) "American National Standard for Respiratory Protection," 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

**Hand/Skin protection:** Recommended in situations where abrasion from sand may occur.

**Eye 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. There is a potential for severe eye irritation for those wearing contact lenses.

**General Hygiene Considerations:** There are no known hazards associated with this material when used as recommended. Following the guidelines in this SDS is recognized as good industrial hygiene practice. Avoid breathing dust. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities.

## 9 Physical and chemical properties

**9.1 Information on basic physical and chemical properties**

**General Information**

**Appearance**

| | |
|---|---|
| **Form:** | Granular Solid |
| **Colour:** | Tan, Gray, Buff or Red |
| **Odour:** | None |
| **Odour threshold:** | None |
| **pH:** | Not Applicable |
| **Melting point/range:** | >1000 °C |
| **Boiling point/range:** | >1000 °C |
| **Flash point:** | None |
| **Evaporation rate:** | No data available |
| **Flammability (solid, gaseous):** | Non-combustible solid |
| **Upper/lower flammability or explosive limit:** | Non-combustible solid |
| **Vapor pressure:** | Not Applicable |
| **Vapor density:** | Not Applicable |
| **Relative Density at 20°C:** | 2.65g/cm³ |
| **Solubility in / Miscibility with Water:** | Insoluble |
| **Partition coefficient (n-octanol/water):** | Not applicable |
| **Auto/Self-ignition temperature:** | No data available |
| **Decomposition temperature:** | No data available |
| **Viscosity** | Not applicable |

## 10 Stability and reactivity

**10.1 Reactivity**

**Reactivity:** Reactive with strong oxidizing agents

**Chemical Stability:** Stable

**Thermal Stability:** If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.

**Incompatibility:** Strong oxidizing agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, oxygen difluoride, hydrogen peroxide, etc.; acetylene and ammonia.

**Hazardous Decomposition Products:** Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.

**Hazardous Polymerization:** Not known to polymerize.

## 11 Toxicological information

**CAUTION:** Crystalline silica exists in several forms, the most common of which is quartz. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz.

**Potential Health Effects:**

**Primary routes(s) of exposure:** Inhalation, Skin, ingestion

**Inhalation:**

**Acute Effects:** One form of silicosis, acute silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months. The symptoms of acute silicosis include (but are not limited to) progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

**Chronic Effects:** The adverse health effects – lung disease, silicosis, cancer, autoimmune disease, tuberculosis, and nephrotoxicity -- are chronic effects.

**Eye Contact:** Crystalline silica (quartz) may cause abrasion of the cornea.

**Skin Contact**: May cause abrasion to skin.

**Ingestion**: No adverse effects expected for incidental ingestion. Ingestion of large amounts may cause gastrointestinal tract irritation.

**Medical Conditions Generally Aggravated by Exposure:** The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. 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 of exposure to levels above the occupational exposure limits for 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 may develop into complicated 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. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pumonale) secondary to the lung disease.

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

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

B. CANCER

IARC - The International Agency for Research on Cancer ("IARC") concluded that there is "sufficient evidence in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite", there is "sufficient evidence in experimental animals for the carcinogenicity of quartz dust" and that there is “limited evidence in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust.” The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite dust is carcinogenic to humans (Group 1)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that “Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "Silica Dust, Crystalline, in the Form of Quartz or Cristobalite" (2012).

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Crystalline silica is not on the OSHA carcinogen list.

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, -- scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) “Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers”, Arh Hig Rada Toksikol, (60) 185-90 (2009); (2) "Occupational Exposure to Crystalline Silica and Autoimmune Disease", Environmental Health Perspectives, (107) Supplement 5, 793-802 (1999); (3) "Occupational Scleroderma", Current Opinion in Rheumatology, (11) 490-494 (1999); (4) “Connective Tissue Disease and Silicosis”, Am J Ind Med, (35), 375-381 (1999).

D. TUBERCULOSIS

Individuals with silicosis are at increased risk to develop pulmonary tuberculosis, if exposed to persons with tuberculosis. The following may be consulted for further information: (1) “Tuberculosis and Silicosis: Epidemiology, Diagnosis and Chemoprophylaxis”, J Bras Pneumol, (34) 959-66 (2008); (2) Occupational Lung Disorders, Third Edition, Chapter 12, entitled "Silicosis and Related Diseases", Parkes, W. Raymond (1994); (3) "Risk of Pulmonary Tuberculosis Relative to Silicosis and Exposure to Silica Dust in South African Gold Miners," Occup Environ Med, (55) 496-502 (1998); (4) “Occupational Risk Factors for Developing Tuberculosis”, Am J Ind Med, (30) 148-154 (1996).

E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including end stage renal disease. For additional information on the subject, the following may be consulted: (1) “Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update”, Ann Occup Hyg, (49) 367-73 (2005); (2) "Kidney Disease and Silicosis", Nephron, (85) 14-19 (2000); (3) “End Stage Renal Disease Among Ceramic Workers Exposed to Silica”, Occup Environ Med, (56) 559-561 (1999); (4) “Kidney Disease and Arthritis in a Cohort Study of Workers Exposed to Silica”, Epidemiology, (12) 405-412 (2001).

F. NON-MALIGNANT RESPIRATORY DISEASES

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease. NIOSH Hazard Review – Health

Effects of Occupational Exposure to Respirable Crystalline Silica, published in April 2002, available from NIOSH, 4676 Columbia Parkway, Cincinnati, OH 45226,

## 12 Ecological information

Crystalline silica is not known to be ecotoxic.

## 13 Disposal considerations

**13.1 Waste treatment methods**
**Waste from residue/unused product:** General: Crystalline silica may be landfilled. Material should be placed in covered containers to minimize generation of airborne dust.
**Contaminated packaging:** Disposal must be made in accordance with official federal, state and local regulations.

## 14 Transport information

**DOT**
Not dangerous goods

**IATA**
Not dangerous goods

**IMDG**
Not dangerous goods

**TDG**
Not dangerous goods

## 15 Regulatory Information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
**OTHER US REGULATORY INFORMATION:**
**OSHA:** Crystalline Silica is not listed as a carcinogen.
**SARA Title III:** This product is not subject to the reporting requirements of Title III of SARA, 1986
**TSCA.:** Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.
**RCRA:** Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.
**CERCLA:** Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4
**EPCRA (Emergency Planning and Community Right to Know Act):** Crystalline silica (quartz) is not an extremely hazardous substance under regulations of the Emergency Planning and Community Right to Know Act, 40 CFR Part 355, Appendices A and B and is not a toxic chemical subject to the requirements of Section 313.
**Clean Air Act:** Crystalline silica (quartz) mined and processed by Badger Mining Corporation was not processed with or does not contain any Class I or Class II ozone depleting substances.
**FDA:** Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3).(The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).
**California Proposition 65:** Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.
**Massachusetts Toxic Use Reduction Act:** Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.
**Pennsylvania Worker and Community Right to Know Act:** Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.
**15.2 Chemical Safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

atures and shall not establish a legally valid contractual relationship.

**Definitions of Acronyms**
ACGIH: American Conference of Governmental Industrial Hygienists
ANSI: American National Standards Institute
APF: Assigned Protection Factor
California REL: California Inhalation Reference Exposure Limit
CAS: Chemical Abstracts Service
CCOHS: Canadian Centre for Occupational Health and Safety
CEPA: Canadian Environmental Protection Agency
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CFR: US Code of Federal Regulations
CPR: Controlled Products Regulation
DHHS: Department of Health and Human Services
DSL: Domestic Substances List
EEC: European Economic Community Guidelines
EINECS: European Inventory of Existing Commercial chemical Substances
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right to Know Act

FDA: Food and Drug Administration
GHS: Globally Harmonized System
HEPA: High-Efficiency Particulate Air
IARC: International Agency for Research on Cancer
IDLH: Immediately Dangerous to Life and Health
MSHA: Mine Safety and Health Administration
NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services
NIOSH REL: NIOSH Recommended Exposure Limit
NPRI: National Pollutant Release Inventory
NTP: National Toxicology Program
OEL: Occupational Exposure Limit
OSHA: Occupational Safety and Health Administration, US Department of Labor
PEL: Permissible Exposure Limit
PMF: Progressive Massive Fibrosis
RCRA: Resource Conservation and Recovery Act
SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
TLV: Threshold Limit Value
TSCA: Toxic Substance Control Act
TWA: Time-Weighted Average
WHMIS: Workplace Hazardous Materials Information System