

POTENTIAL HEALTH EFFECTS

EYE: Particulate matter may scratch the cornea or cause other mechanical injury to the eye.

SKIN: None anticipated.

INGESTION: Relatively non-toxic. Ingestion is not anticipated under normal working conditions.

INHALATION: Inhalation of high concentrations may cause respiratory irritation and coughing.

SIGNS AND SYMPTOMS: Scratching or physical damage to the eyes can cause irritation, redness, pain, tear formation, blurred vision, and light sensitivity. Symptoms of silicosis include phlegm, coughing, and characteristic x-rays. The damaged lungs will become increasingly less able to provide the body with oxygen causing tiredness, shortness of breath, decreased capacity to work, and can result in death by cardiac failure or by the destruction of lung tissue. Shortness of breath upon exertion is one of the most common symptoms of silicosis. Limited chest expansion is the most common physical sign.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Long-term dust exposure may aggravate pre-existing respiratory disease. Persons who develop silicosis have greatly increased risks of developing tuberculosis and workers who are exposed to crystalline silica and smoke have increased risks of lung damage.

CHRONIC: Reported inhalation of respirable quartz over a number of years can cause lung disease (silicosis) and increase the risks of developing respiratory cancer. Silicosis is a progressive fibrotic pneumoconiosis which greatly decreases the ability of the lungs to provide oxygen (decreased pulmonary capacity). The disease may progress even if the worker is removed from exposure. The extent and severity of lung injury depends on a variety of factors including particle size, percentage of silica, natural resistance, dust concentration and length of exposure. As cristobalite concentrations in this product are below 0.1%, quartz would be expected to be the pathologic crystalline silica agent.

Long-term dust inhalation may decrease the ability of the lungs to clear particulate matter causing shortness of breath and increased susceptibility to respiratory disease. Based on similarity to other aluminum silicates, andalusite may cause a form of lung fibrosis that is milder than silicosis.

TARGET ORGANS: Lungs

CARCINOGENICITY: NTP: Yes IARC: Yes (Group 1) OSHA: Yes

IARC and NTP classify respirable crystalline silica as a confirmed or known human carcinogen. Although OSHA has not promulgated a specific standard for crystalline silica, materials that contain > 0.1% crystalline silica should be treated as a confirmed carcinogen for hazard communication purposes (29 CFR 1910.1200).

4. FIRST AID MEASURES

EYE: Flush eyes with lukewarm water for 15 minutes opening and closing eyelids to ensure adequate rinsing. If redness, irritation, pain, or tearing occurs, seek medical attention.

SKIN: Exposure not anticipated.

4. FIRST AID MEASURES (continued)

INHALATION: Not anticipated. If large amounts of dusts are inhaled, remove to fresh air. If breathing problems occur, a certified professional should administer oxygen or CPR if indicated. Seek immediate medical attention.

INGESTION: None required.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: Not Applicable

FLAMMABLE LIMITS: LEL: Not Applicable UEL: Not Applicable

NFPA CLASSIFICATION:

HEALTH: 0

FLAMMABILITY: 0

INSTABILITY: 0

EXTINGUISHING MEDIA: Any. Use media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARDS: Non-flammable, non-combustible. Product will not burn.

HAZARDOUS DECOMPOSITION PRODUCTS: Will form mullite and cristobalite at high temperatures.

FIRE FIGHTING INSTRUCTIONS: Firefighters should wear a NIOSH approved full-facepiece self-contained breathing apparatus (SCBA) operated in positive pressure mode and full turnout or bunker gear.

6. ACCIDENTAL RELEASE MEASURES

Isolate hazard area and deny entry to unauthorized and/or unprotected personnel. Do not walk through or otherwise scatter spilled material. For small spills, clean with a vacuum with a filtration system sufficient to remove and prevent recirculation of crystalline silica (a vacuum equipped with a high-efficiency particulate air (HEPA) filter is sufficient). For large spills, use a fine spray or mist to control dust creation and carefully scoop or shovel into clean dry container for later reuse or disposal. **DO NOT USE DRY SWEEPING OR COMPRESSED AIR TO CLEAN SPILLS.** Appropriate protective equipment including respiratory protection is essential for all clean-up personnel (See Section 8). Completely remove dusts to prevent recirculation of crystalline silica into the workplace.

7. HANDLING AND STORAGE

Store in dry area in closed containers. Storage and work areas should be periodically cleaned to minimize dust accumulation. Avoid dust inhalation and promulgation. **DO NOT** use compressed air or dry sweeping to remove dust from work area. Dusts should be removed using an appropriately equipped vacuum. If an appropriate vacuum is unavailable, only wet-clean-up methods should be used (i.e.: misting). Moisture should be added as necessary to reduce exposure to airborne respirable crystalline and fused silica dust.

Under dusty conditions, employees should wear coveralls or other suitable work clothing. Contaminated clothing must be vacuumed before removal. **DO NOT REMOVE** dusts from clothing by blowing or shaking.

7. HANDLING AND STORAGE (continued)

Practice good housekeeping. Wash thoroughly after handling. Change contaminated clothing. Do not reuse until laundered. Do not take silica contaminated clothing home.

Comply with OSHA Hazard Communication Rule 29 CFR 1910.1200, and applicable federal, state, and local worker or community "right-to-know" laws and regulations during storage, use, and disposal of this product. For further information, consult the American Society for Testing and Materials (ASTM) standard practice ASTM E 1132 Revision 99A, "Standard Practice for Health Requirements Relating to Occupational Exposure to Crystalline Silica".

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY: Under normal working conditions, below acceptable exposure guidelines, none is required. Appropriate respirator selection is dependent upon the magnitude of exposure. For air concentrations above the PEL to 2.5 mg/m³ crystalline silica, a NIOSH approved full facepiece air-purifying respirator with a HEPA filter or powered air-purifying respirator with a tight-fitting facepiece and HEPA filter may be worn

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

SKIN: None required.

EYES: Safety-glasses with side-shields or goggles to prevent dust and particles from entering the eye.

ENGINEERING CONTROLS: Local exhaust ventilation and collection systems must be designed and maintained to prevent the accumulation and recirculation of free silica dust into the workplace.

OTHER: Where there is a potential exposure to free silica, the following warnings should be readily visible and posted near entrances or accessways to work areas: **WARNING! FREE SILICA WORK AREA.** Unauthorized persons keep out. The following warning should be posted within the work area where potential exposure may occur: **WARNING! FREE SILICA WORK AREA.** Avoid Breathing Dust. May Cause Delayed Lung Injury (silicosis). (NIOSH Criteria Document, Occupational Exposure to Crystalline Silica, pg. 5, 1974)

Medical surveillance program in accordance with "Criteria for a Recommended Standard. . . Occupational Exposure to Crystalline Silica", NIOSH, pp.: 2-4, 1974.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Pink gray to brown cubic crystals
ODOR:	Odorless
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY (H₂O = 1):	3.1
MELTING POINT:	(1780 °C)
pH (10% slurry):	6.5-8
% VOLATILE	0
TYPES:	Crystals

10. STABILITY AND REACTIVITY

STABILITY: Stable

REACTIVITY/INCOMPATIBILITY: Silica is incompatible with strong oxidizers (i.e.: fluorine, oxygen difluoride, and chlorine trifluoride).

DECOMPOSITION PRODUCTS: May convert to mullite and cristobalite at high temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

EYE: Particulate matter may cause physical injury to the eye.

SKIN: Skin irritation is not anticipated.

INHALATION: Inhalation of high concentrations of dust may cause coughing and mild, transitory respiratory irritation. Inhalation of very high concentrations of crystalline silica in a short period of time have occasionally caused acute or rapidly-developing silicosis.

INGESTION: Product is relatively non-toxic if ingested.

CHRONIC: Classic silicosis is characterized by the formation of scattered silica containing nodules of scar tissue in the lungs ranging in size from microscopic to greater than 1 cm. Simple silicosis (nodules < 1 cm) is generally asymptomatic but may progress to debilitating complicated silicosis (nodules > 1 cm) with or without continued exposure. Historically, workers who developed silicosis had greatly increased risks of developing an accompanying tuberculosis infection (silicotuberculosis). Fifty years ago, tuberculosis accounted for 75% of the deaths among silicotic workers.

Andalusite is a naturally occurring aluminum silicate. Other aluminum silicates such as kaolin have caused mild lung fibrosis in the absence of crystalline silica.

SUBCHRONIC: No Data

OTHER: Silica particles < 10 µm are considered respirable; however, particles retained in the lungs are generally much smaller. Silica particles retained in the human lung have median diameters of 0.5-0.7 µm.

12. ECOLOGICAL INFORMATION

Andalusite is a naturally occurring aluminum silicate. It does not contain ozone depleting substances and is not expected to exert an ecotoxic effect or bioconcentrate in the food chain.

13. DISPOSAL CONSIDERATIONS

Dispose of according to applicable federal, state, and local regulations.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT): Not Classified

15. REGULATORY INFORMATION

CANADIAN WHMIS: D2A, D2B

EPCRA Section 302 (EHSs): This product does not contain ingredients subject to reporting requirements of 40 CFR Part 355, Appendices A and B (Extremely Hazardous Substances).

CERCLA, Section 304: This product does not contain ingredients subject to state and local reporting under Section 304 of SARA Title III as listed in 40 CFR Part 302, Table 302.4

SARA 313 REPORTING REQUIREMENTS: This product does not contain ingredients subject to the reporting requirements of Section 313 SARA, and Section 6607 of the Pollution Prevention Act:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA Hazard Categories promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and by definition meets the requirements of the following category:
Chronic Health Hazard

CALIFORNIA PROPOSITION 65: This product contains crystalline silica, an ingredient known to the State of California to cause cancer.

TSCA (Toxic Substances Control Act): All ingredients contained in this product are on the TSCA inventory.

16. OTHER INFORMATION

Revision Date: 9/5/00 Quartz TLV revised to 0.05
8/27/01 updated new area code for manufacturing facility.
8/15/03 Health and safety review and update

KEY:

ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service
(C): Ceiling Limit
DOT: Department of Transportation
IARC: International Agency for Research on Cancer
MSHA: Mine Safety and Health Administration
NFPA: National Fire Protection Association
NIOSH: National Institute for Occupational Safety and Health
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
SARA: Superfund Amendment and Reauthorization Act
TLV: Threshold Limit Value

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