SANDBLASTING AND PAINTING

SUBPART A - SCOPE

The scope of the program provides standard operating procedures to ensure the protection of all employees from respiratory hazards during blasting and painting operations.

This program is in accordance with the requirements of OSHA 29 CFR 1910.134, 1926.57, 1910.1053(d), and 1926.1153(d).

Exposure assessments must be conducted for those employees who are expected to be exposed to respirable crystalline silica at or above the action level (8-hour TWA of 25 ug/m3). This can be done by monitoring employees individually or taking a representative sample from employees.

The program will be evaluated at least annually or as necessary for effectiveness. Instances where reevaluation may be necessary include regulatory updates, changes in equipment, and employee exposure incidents.

SUBPART B - PURPOSE

During the course of blasting, the blasting media (abrasives) and the surface coatings on the materials blasted are shattered and pulverized usually causing dust particulates to be formed of respirable size. The composition and toxicity of the dust from these sources shall be considered in making an evaluation of the potential health hazards.

Others tasks that might expose employees to respirable crystalline silica besides blasting include: sawing, drilling, jackhammering, grinding, etc.

SUBPART C - VENTILATION

Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, such as blasting and painting, their concentrations shall not exceed the PEL limits specified in **1926.55 App A.**

The concentration of respirable dust or fumes in the breathing zone of the abrasive-blasting operator or any other worker shall be kept below the levels specified in 1926.55 or other pertinent sections of this part.

When ventilation is used as an engineering control method, the system shall be installed and operated according to the requirements of the manufacturer and local/state/and federal laws.

SUBPART D - BREATHING AIR QUALITY AND USE

The Company shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for abrasive-blasting respirators must be free of harmful quantities of dust, mists, or noxious gases and must meet the following requirements / specifications:

- Compressed and liquid oxygen shall meet the United States Pharmacopoeia requirements for medical or breathing oxygen.
- Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

- Oxygen content (v/v) of 19.5-23.5%.
- Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less.
- Carbon monoxide (CO) content of 10 ppm or less;
- Carbon dioxide content of 1,000 ppm or less; and
- Lack of noticeable odor.

- Compressed oxygen will not be used in atmosphere-supplying respirators that have previously used compressed air.
- Oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.
- Cylinders used to supply breathing air to respirators meet the following requirements.
- Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR part 173 and part 178)
- Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air.
- Moisture content in breathing air cylinders does not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure
- Breathing air couplings are incompatible with outlets for non-respirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.
- Breathing gas containers shall be marked in accordance with the NIOSH respirator certification standard, 42 CFR part 84.

SUBPART E - STATIC ELECTRICITY HAZARDS

Organic abrasives which are combustible shall be used only in automatic systems. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electric wiring, shall conform to the requirements of American National Standard Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1961 (NFPA 91-1961), and Subpart S.

The blast nozzle shall be bonded and grounded to prevent the build up of static charges.

Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located on sides away from any occupied area, to provide for pressure relief in case of explosion, following the principles set forth in the National Fire Protection Association Explosion venting Guide. NFPA 68-1954.

SUBPART F - BLASTING AND PAINTING TRAINING

All employees subject to silica exposure from sand blasting operations as well as those employees exposed to painting fumes shall be provided information about adverse health effects, work practices, Hazcom, and use and care of personal protective equipment prior to working with silica and periodically refresher training thereafter.

Silicosis is characterized by shortness of breath, fever and bluish skin. It could be diagnosed as pulmonary edema (fluid in lungs), pneumonia or tuberculosis. Silica dust causes severe fungal infections to develop. This condition could be fatal.

The following is a summary of the effects of Silicosis:

Chronic	10 years exposure to low concentrations.
Accelerated	Exposure to high concentrations, which develop in 5 to 10 years.
Acute	Exposure to extremely high concentrations. Symptoms develop within a few weeks to a few years.

This program along with the Respiratory Protection Program is available to employees for review if requested either electronically or physically.

SUBPART G - MEDICAL MONITORING

Workers exposed to crystalline silica shall be included in the medical monitoring program of the Respiratory Protection Program if exposure is equal to or exceeds the action level for 30 or more days per year or if they are required to wear a

respirator more than 30 days per year. Such examinations should occur before job placement and annually thereafter. More frequent examinations may be necessary for workers at risk or acute or accelerated silicosis. Exams should include at least the following items:

- A medical and occupational history to collect data on worker exposure.
- A chest X-Ray.
- Pulmonary function testing.
- Annual evaluation for tuberculosis.

Signs shall be posted to warn workers about the hazard and specify any protective equipment required.

NOTE: NIOSH encourages the reporting of all cases of silicosis to the State Health Department and to OSHA and/or MSHA.

SUBPART H - ENGINEERING CONTROLS

Methods of engineering controls and work practices used to reduce and maintain employee exposure to the lowest feasible level of respirable crystalline silica might include:

- Use of an alternate blasting media
- Containment methods such as blast cleaning machines & cabinets, blasting rooms or portable equipment, blasting curtains, etc.
- Air monitoring
  - Air monitoring should be performed to measure worker exposure to airborne crystalline silica and to provide a basis for selecting engineering controls.(NIOSH 92.102)
- Personal hygiene
  - All sandblasters should wash their hands and faces before eating, drinking or smoking.
  - No eating, drinking or tobacco products in the blasting area.
  - Workers should shower before leaving worksite.
  - Vehicles should not be parked in contaminated area.
- Protective Clothing

- Workers should change into disposable or washable work clothes at the worksite.
- Workers should change into clean clothing before leaving the worksite.

If engineering controls cannot keep silica exposures below the NIOSH **PEL respiratory protection must** be used. Respirators will be provided to employees who or will be exposed to actionable levels of respirable crystalline silica according to 1910.1053(e) (4), 1926.1153(c).

Refer to BBGCI Respiratory Protection for more information on monitoring and medical surveillance.

SUBPART I - ADMINISTRATION CONTROLS

Methods of administration controls include:

- Providing PPE for protection of the eyes and face to the employee when the respirator design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations. This equipment shall conform to the requirements of 1926.102.
  - Safety glasses
  - Goggles
  - Face shields
  - Blasting hoods

Refer to BBGCI PPE Policy and Procedure for more information on PPE.

SUBPART J - HOUSEKEEPING

Dust shall not be permitted to accumulate on the floor or on ledges outside of an abrasive-blasting enclosure, and dust spills shall be cleaned up promptly. Aisles and walkways shall be kept clear of steel shot or similar abrasive which may create a slipping hazard.

Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi. and then only with effective chip guarding and personal protective equipment which meets the requirements of Subpart E of this part. The 30 psi. requirement does not apply for concrete form, mill scale and similar cleaning purposes.

Some housekeeping measures that can be used to limit employee exposure to respirable crystalline silica include: vacuuming, sweeping, wetting, and other techniques used to limit the amount of respirable crystalline silica exposure during housekeeping activities.

SUBPART K – RECORD KEEPING

Accurate records of all monitoring data and medical surveillance shall be maintained as required and kept with the employees' medical data file.

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