ABRASIVE BLASTING

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1. PURPOSE

a. The purpose of the Abrasive Blasting Program is to provide guidelines for working with abrasive substances which conform to OSHA and state requirements.

2. SCOPE

a. Abrasive blasting applies to all operations where an abrasive is forcibly applied to a surface by pneumatic or hydraulic pressure, or by centrifugal force. An abrasive is a solid substance used in an abrasive blasting operation. Different abrasive media including steel shot are used in **H2 Enterprises, LLC. (H2)** abrasive blasting operations.

b. Some tasks performed at **H2** with abrasive blasting media include cleaning and removing paint from pipe and other metal surfaces. Abrasives and the coatings on the materials blasted are shattered and pulverized during blasting operations and the dust formed will contain particles 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.

c. Whenever hazardous substances such as dusts, fumes, mists, vapors or gases exist or are produced during construction work, their concentrations shall not exceed the limits specified in 1926.55(a). When ventilation is used as an engineering control method, the system shall be installed and maintained per the requirements of this section.

d. **H2 Enterprises, LLC.** does not use organic abrasives which can become combustible when blasting. Organic abrasives which are combustible shall be used in automatic blasting systems only. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electrical wiring, shall conform to the ANSI Z-33.1 and NFPA 91-1961. The blast nozzle shall be bonded and grounded to prevent the buildup 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 in accordance with NFPA 68-1954.

3. REFERENCES

a. 29 CFR 1926.55(a); 1910.94(a); 1910.134(i)

4. HAZARDS

a. The hazards involved in abrasive blasting include the material that is being removed and the surface from which the material is being removed. Lead is an example of a

hazardous material being removed, while exposure to silica comes from using sand and other silica-producing materials in the blasting process. Both materials involve inhalation hazards.

b. Silica has traditionally been used as a material in the abrasive blasting process. However, NIOSH recommends against the use of silica sand (or other substances containing more than 1 percent free silica) as abrasive blasting material. **H2 Enterprises, LLC** policy is to not buy any blasting media with more than 1% silica content.

c. Sometimes the dust that is formed from abrasive blasting can be flammable or explosive. This can involve obvious hazards of fire and explosion. Along with these risks are those of flying debris to the eyes, face, and any other exposed skin.

d. OSHA regulations cover the hazards involved with abrasive blasting under 1910.94(a).

e. Safe practice when using compressed air lines will be adhered to according to company policy; therefore, compressed air must not be used for cleaning unless the pressure is reduced to less than 30 p.s.i. under 1910.242 (b).

5. PROTECTION

a. Protection can be implemented through engineering controls, administrative controls, safe work practices, and, finally, personal protective equipment. One form of engineering control is to find an alternative to abrasive blasting. A respiratory protection program is in place to protect employees performing abrasive blasting.

b. All blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. Devices (bungee cords, duct tape, wire, etc.) used to keep it open are strictly prohibited.

6. ALTERNATIVES TO TRADITIONAL ABRASIVE BLASTING

a. Substituting less toxic abrasive materials for the traditional high-silica-containing abrasive is becoming more common in the United States. The United States Navy has banned silica sand or any abrasive materials containing greater than 1 percent crystalline silica by weight for abrasive blasting on ships. However, even with a low-silica-content abrasive (less than 1 percent free silica), work in containment structures or in confined spaces may result in hazardous exposures.

b. Other alternatives to abrasive blasting include the following:

   i. Over coating—Over coating is the application of a new coating on top of existing coatings;
   ii. Chemical Stripping—Chemical stripping involves spraying an alkaline chemical on the painted surface, allowing it to react, and then scraping the decomposed paint and excess caustic from the steel surface.

iii. Wet Blasting—Wet methods have been used to reduce dustiness associated with lead-based paint removal projects. Both high-pressure water alone and water mixed with abrasive have been used.

iv. Power Tools—Power tools can be used to sand, scrape, or chip coatings from steel structures. However, the need to apply power tools firmly against the surface at all times can create worker fatigue and musculoskeletal hazards, and some tools may not be able to clean irregular surfaces.

7. VENTILATION

a. Ventilation plays an important role in abrasive blasting. Often, the area where blasting is performed is contained and ventilation supplied to remove contaminated air and usher in fresh air.

b. All containment structures should be ventilated to maintain a continuous airflow and prevent any leakage of dust to the outside. Exhaust air should be discharged to the outside through an appropriate dust collector. The dust collector should be set up sothat accumulated dust can be removed without contaminating work areas.

c. If heaters are used, especially in a contained area, ventilation is needed to avoid buildup of combustible particles that may be ignited by the heater.

8. PERSONAL HYGIENE

a. To protect employees from exposure to silica and other contaminants during abrasive blasting operations, they should observe the following personal hygiene practices:

i. Wash hands and faces before eating, drinking, or smoking

ii. Do not eat, drink, or use tobacco products in the blasting area

iii. Shower before leaving the worksite

iv. Park vehicles where they will not be contaminated with silica and other substances such as lead.

9. PROTECTIVE EQUIPMENT

a. Respiratory Protective Equipment

i. Only approved respiratory protective equipment such as a blasting hood may be used for protection of personnel against dusts produced during abrasive-blasting operations. Particulate filter respirators, commonly referred to as dust-filter respirators, properly fitted, may be used for short, intermittent or occasional dust exposures. Dust-filter respirators may be used to protect the operator of outside abrasive-blasting operations where non-silica abrasives are used.

ii. A respiratory protection program has been established when it is necessary to use respiratory protective equipment.

iii. Ventilation equipment can help remove particles from the air around the work area. However, even with well-designed airflow patterns, workers near the abrasive blasting may still have hazardous exposures.

iv. Air for abrasive blasting respirators must be free of harmful quantities of dusts, mists, or noxious gases, and meet the requirements for supplied air quality and use specified in 29 CFR 1910.134(i).

b. Other Protective Equipment

i. Operators must be equipped with heavy canvas or leather gloves and aprons or equivalent protection to protect them from the impact of abrasives.

ii. Equipment for protection of the eyes and face must be supplied to the operator when the respirator design does not provide such protection and to any other personnel working near abrasive blasting operations.

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

iv. To assure that dusty clothes do not contaminate cars, homes, or worksites other than the blasting area, employees should change into disposable or washable work clothes at the worksite and change into clean clothes before leaving the worksite.