

GRAVITY

SECTION 4 **CHAPTER 19** **ABRASIVE BLASTING**

Purpose To control exposure of hazardous substances such as dust, fumes, mists, vapors or gases that exist or are produced in the course of abrasive blasting.

Scope Affected employees in abrasive blasting operations.

In this chapter

Topic	See Page
General Exposure Controls	2
Dust Hazards from Abrasive Blasting	2
Static Electricity/Explosive Mixtures	2
Worksite Specific Procedures/Controls	3
Personal Protective Equipment Controls	4
Air Supply and Air Compressors	4
Breathing Air Quality and Use	5
Operational Procedures and General Safety	6

Abrasive Blasting

General exposure controls

Whenever hazardous substances such as dust, fumes, mists, vapors or gases exits or are produced during blasting, 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 operated according to the requirements of this section.

- local exhaust ventilation shall be designed to prevent dispersion of dust, fumes, mists, vapors and gases in concentrations causing harmful exposure. Such exhaust systems shall be so designed that dust, fumes, mists, vapors or gases are not drawn through the work area of employees.
- Exposure of employees to inhalation, ingestion, skin absorption, or contact with any material of substance at a concentration above those specified in the “Threshold Limit Values of Airborne Contaminants” – American Conference of Governmental Hygienists shall be avoided.

Note Reference: OSHA Standard 1926.55 (A)

Dust hazards from abrasive blasting

Abrasives and the surface coatings on the materials blasted or 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.

Static Electricity - explosive mixtures

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.

- 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 and closure, 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.

Note Reference: Z33.1-1961

**Worksite
specific
procedures –
controls**

A respiratory protection program shall be established wherever it is necessary to use respiratory protective equipment. Respirators shall be provided by Gravity Oilfield Services when such equipment is necessary to protect the health of the employee.

Gravity Oilfield Services shall:

- provide the respirators which are applicable and suitable for the purpose intended
- be responsible for the establishment and maintenance of a respiratory protection program with worksite specific procedures

Gravity Oilfield Services shall include in the program the following provisions of this section as applicable:

- Procedures for selecting respirators for use in the workplace.
- Medical evaluations of employees required to use respirators.
- Fit testing procedures for tight fitting respirators.
- Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations.
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding and otherwise maintaining respirators.
- Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators.
- Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations.
- Training of employees in the proper use of respirators, including donning and doffing, and any limitations on their use, and their maintenance; and
- procedures for regularly evaluating the effectiveness of the program

See *Respiratory Protection* for more information

Personal protective equipment controls

Equipment for protection of the eyes and face shall be worn when the respirator design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations.

Employees shall be provided with eye and face protection equipment when machines or operations present potential eye or face injury from:

- physical,
- chemical, or
- radiation agents

Eye and face protection shall meet the ANSI Z87.1 standard. Employees whose vision requires the use of corrective lenses in spectacles shall be protected by goggles or spectacles of one of the following types:

- Spectacles whose protective lenses provide optical correction;
- Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles;
- Goggles that incorporate corrective lenses mounted behind the protective lenses.

Face and eye protection equipment shall be kept clean and in good repair. The use of this type equipment with structural or optical defects shall be prohibited.

Air supply and air compressors

Air for abrasive-blasting respirators must be free of harmful quantities of dust, mists, or gases harmful to life or health.

Breathing air quality and use

Employees that will be using supplied-air and SCBA units will be provided breathing gases of high purity. Compressed breathing air shall meet at least the requirements for Grade D breathing air to include:

- Oxygen content of 19.5 – 23.5 %
- hydrocarbon content of 5 milligrams per cubic meter of air or less;
- Carbon monoxide (CO) content of 10 ppm or less;
- Carbon dioxide content of 1000 ppm or less; and
- Lack of noticeable odor.

Compressed oxygen shall not be used in atmosphere-supplying respirators that have previously used compressed air. Cylinders used to supply breathing air to respirators meet the following requirements:

- Cylinders are tested and maintained
- Cylinders of purchased breathing air have a certificate of analysis from the supplier.
- The moisture content in the cylinder does not exceed the specified dew point of –50 degrees F at 1 atmosphere pressure.

Compressors used to supply breathing air to respirators are constructed and situated so as to:

- prevent entry of contaminated air into the air supply system
- minimize moisture content so the dew point at 1 atmosphere pressure is 10 degrees F below the ambient temperature
- have suitable inline air purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filter shall be maintained and replaced or refurbished periodically following the manufacturer's instructions
- have a tag containing the most recent change date and the signature of the person authorized by the employer to perform a change. The tag shall be maintained at the compressor. For compressors that are not oil lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm
- for oil lubricated compressors, GOS shall use a high temperature and or carbon monoxide alarm to monitor carbon monoxide levels. If only high temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm
- GOS requires that breathing air couplings are **incompatible** with outlets for non-respirable worksite air for other gas systems. No asphyxiating substance shall be introduced into the breathing air lines



**Operational
procedures and
general safety**

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.

Abrasive blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

Compressed air shall not be used for cleaning purposes.
