

Safety Hazards

Abrasive Blasting (Sandblasting)

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What is abrasive blasting?

Abrasive blasting involves the high-velocity expulsion of media with compressed air onto a surface. Sandblasting is a type of abrasive blasting used to treat a surface in some way.

There are different ways in which blasting can treat a surface, including:

- Cleaning
- Removing paint or other coatings
- Removing rust
- Adding texture to a smooth surface
- Smoothing a rough surface

Abrasive blasting uses sand as its blasting media. Other media used in abrasive blasting include:

- Steel shot
- Steel grit
- Aluminum oxide
- Plastic
- Sponge
- Walnut shells

Since its inception in the 1800s, sandblasting has traditionally used silica sand, but due to more recent understanding of the health effects of silica, other media have been introduced. The term "sandblasting" is still commonly used to refer to abrasive blasting. Other forms of blasting exist, such as shot blasting and wet blasting.

What are the health and safety hazards of abrasive blasting?

Abrasive blasting operations can pose hazards to both the blast operator and those in the surrounding area. The health and safety hazards of abrasive blasting include:

- Noise
 - [Auditory effects](#) of noise (including tinnitus and noise-induced hearing loss)
 - [Non-auditory effects](#) of noise
 - Dust (the hazard depends on the media used)
 - Severe skin and eye abrasion if the blaster nozzle is directed at a person
 - Respiratory and other health effects from inhalation of the blasting media in the air
 - The surface being blasted, such as lead poisoning from lead-based paint
 - Media material. Different health effects are possible depending on the media used. Inhalation of silica sand media can result in [silicosis](#) and lung cancer. Other media, while generally considered safer, can still affect the health of those exposed to them, such as respiratory irritation if inhaled. Refer to the [safety data sheet \(SDS\)](#) for the blasting media in use.
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What measures can be taken to protect workers during abrasive blasting?

Ensure that a plan and procedure are in place before starting a blasting operation. These measures should take into consideration:

- The hazards of the blaster (refer to the manufacturer's instructions).
- The media (refer to the SDS).
- The surface being blasted and the potential hazards.
- Environmental factors that could affect the operation, such as wind.
- All persons who can be affected, including the blast operator and those people in the area.
- Training needs, schedule, and plan.

- Cleanup and waste disposal.

Conduct a [risk assessment](#) to identify the hazards and recommend control measures according to the [hierarchy of controls](#).

Consider the following control measures, based on your operation's hazards and risks:

- Replace the media with a safer alternative (preferably one that can be delivered with water to reduce dust).
- Ensure the work area is well-ventilated. Use exhaust ventilation, if possible, to remove dust.
- Perform blasting within an enclosed system, if possible, such as a:
 - Blasting cabinet (suitable for relatively small workpieces and protects all workers).
 - Blasting room or booth (useful for containing the dust and protecting those people not involved in the blasting operation, but the blaster operator is still exposed).
- Use barriers to protect those not involved from the blasting operation.
- Designate areas for abrasive blasting and restrict access to these areas. Signs and floor markings can help.
- Consider factors that could affect the movement of the blasting media in the air. For example, do not have workers downwind.
- Train all blasting workers on the use of the blaster, personal protective equipment (PPE), the hazards, and control measures.
- Do not eat, drink, or smoke in the blasting area.
- Clean up the contaminated areas, surfaces, and clothing upon completion of work. Consider the viability of wet cleaning methods or vacuuming (a high-efficiency particulate air (HEPA)-filtered vacuum may be used, depending on the size of the particles, the media used, and the amount of dust).
- Provide suitable PPE and ensure that they are correctly used by workers (refer to the section below).
- Provide facilities for:
 - Workers to wash their hands and face
 - The removal and temporary storage of contaminated PPE and clothing
 - The decontamination of PPE and clothing
- Do not allow contaminated objects (such as PPE) in clean areas. Use bags or containers if transportation is necessary.

What personal protective equipment should an abrasive blaster operator use?

Personal protective equipment (PPE) is the last line of defence according to the hierarchy of controls, but if a worker is exposed to the blasting media, PPE is likely necessary. Respiratory protection must provide sufficient protection so that the [occupational exposure limits](#) for the media (such as the limits that apply to silica) are not exceeded.

The [respirator selection](#) for your workplace depends on the amount of media in the air and the occupational exposure limit. The respirator's assigned protection factor indicates the level of protection. In general, the more media in the air, the greater protection (indicated by the assigned protection factor) is needed. Due to the amount of media in the air during blasting, an airline supplied-air respirator with a positive-pressure blasting helmet is recommended.

Other recommended PPE for an abrasive blaster operator:

- [Hearing protectors](#) (earplugs or earmuffs) that provide suitable sound reduction based on the noise level.
- [Eye and face protectors](#) (these can be built into the helmet and designed to resist the abrasive force of the blaster).
- [Gloves](#) capable of resisting abrasion, such as those made of leather.
- Coveralls or aprons that protect the skin from abrasion.
- [Safety footwear](#).

Ensure that PPE is selected based on the hazards and fits the worker. The use of any PPE should not introduce additional hazards (for example, eye protectors should not reduce the effectiveness of a respirator).

When selecting PPE, ensure that it meets an accepted standard for your jurisdiction, such as respirators approved by the National Institute for Occupational Safety and Health (NIOSH).

What are some good general safe work practices for abrasive blaster operators?

- Practice safe [manual material handling](#).
- Follow or establish safety procedures for [working alone](#), or for avoiding working alone wherever possible.
- Get current training on chemical hazards, Workplace Hazardous Materials Information System([WHMIS](#)), and [SDSs](#).
- Know [first aid](#) or have a trained first aider and first aid supplies nearby.
- Follow company safety rules.

- Know how to [report hazards](#).
 - Practice good [housekeeping](#).
 - Take scheduled breaks as necessary.
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