

Abrasive blast cleaning

Updated May 2011

EPA 108/11: This guideline provides information on control methods for the dust and noise common to abrasive blast cleaning practices, helping operators to implement the best practice in pollution controls and to become self-monitoring in regard to the Environment Protection Act 1993.

Introduction

Abrasive blasting is defined as an operation in which materials are cleaned by the abrasive action of any metal shot or mineral particulate propelled within a gas or liquid. It is a 'prescribed activity of environmental significance' under Schedule 1 of the *Environment Protection Act 1993* (the Act); these activities require a licence under the Act. Abrasive blasting using totally enclosed automatic blast cleaning units, or those of less than five cubic metres in volume, is not included as a prescribed activity in Schedule 1.

Legislation

The principal legislation addressing pollution in South Australia is the Environment Protection Act. In particular, section 25 imposes the general environmental duty on all persons undertaking an activity that may pollute to take all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

Environment protection legislation also includes Environment Protection Policies (EPP), which may outline both recommendations and mandatory requirements for the protection of a particular aspect of the environment, such as air quality.

Environment Protection (Air Quality) Policy 1994

Regulation of air pollution is primarily governed through the *Environment Protection (Air Quality) Policy 1994* (Air Policy). The Air Policy specifies maximum pollution levels for a range of emissions, including any process emitting solid particles (generally dust) into the atmosphere.

The maximum level of concentration of solid particles, measured at testing points determined by the Air Policy, is a total mass of 250 mg per cubic metre of residual gases after completion of the process and before amalgamation with air, smoke or other gases. The Air Policy requires that the best practicable means of control be used to minimise air pollution.

Environment Protection (Noise) Policy 2007

The *Environment Protection (Noise) Policy 2007* (Noise Policy) provides guidance on the noise levels that may be considered excessive under the Act. It should be noted that the Act requires site-specific issues be taken into account when determining noise levels that may be excessive.

It is important to ensure that all practicable steps are taken to minimise the adverse effect that the noise emissions may have on the amenity value of an area. This responsibility includes not only the noise emitted from the blast equipment and generators but also associated noise sources, such as radios.

Commercial and industrial premises must not allow excessive noise to be emitted from the premises. The Environmental Protection Authority (EPA) may issue an Environment Protection Order requiring that the excessive noise is curtailed within a specified period.

Controls and mitigation

All abrasive blasting must be carried out in a room or cabinet constructed to contain the emission of particulate matter (generally dust) from the blasting operation. The blast room or cabinet must be totally enclosed, and vented to the atmosphere through an effective dust collector, preferable a fabric filter or paper cartridge. The discharge of dusts to the atmosphere must not contravene requirements set by the Act and the Air Quality Policy.

Abrasives such as copper and zinc slags may contain high levels of heavy metals that are toxic; the waste generated may require treatment at a hazardous waste facility. Silica-free abrasives must be used.

Open air blasting is only permissible subject to the consent of the EPA, when the object is too large or too heavy to fit in a booth, or is a fixed structure.

Dust collection

Fabric filters

Fabric filters (felted cloth, pulse air cleaned) and paper cartridges (pulse air cleaned) are the recommended dust collectors; however, other designs may be used.

Filters must ensure that the maximum pollution level of solid particles in each cubic metre of residual gases does not exceed 250 mg, except where:

- there is not a room capable of containing the object to be cleaned within a reasonable distance of the site, or
- the object is part of a fixed structure which cannot reasonably be removed to a booth for cleaning.

Dust collectors must be appropriately maintained in accordance with the manufacturer's recommendations, so adequate access to the filters should be provided to allow for regular inspection and maintenance.

Audible and visible warning devices are recommended to alert the operator if the filters fail.

Exhaust ducts

All exhaust ducts should end at least three metres above the highest structure within a 30-metre radius of the exhaust. Discharge from the dust collector to the atmosphere must be vertical, at a minimum discharge velocity of 10 m/s.

Raincaps that inhibit the upward motion of exhaust gas are not recommended. If a raincap is required, a vertical discharge cap should be used.

Wet dust collection

If a wet dust collection method (scrubber) is selected, then the preferred design is one using the Venturi principle. However, alternative wet collection systems may also be adequate for this purpose. It should be noted, however, that simple spray chambers or wet cyclone dust collectors are not acceptable.

When selecting a wet collection method, the following parameters should be observed:

- An efficient mist eliminator must be incorporated in the collector to minimise the carry over of water particles to the atmosphere.
- Where the collector relies on the maintenance of a water level to maintain efficiency, an automatic water level control device should be incorporated.
- An air–water interlock device must be fitted to ensure that water is provided to the collector before the extraction fans can be started.

Regular inspection, maintenance and sludge removal should occur to ensure efficient operation of a wet dust collector.

Waste dust disposal

Material collected by the fabric filter or wet scrubber should be discharged to disposal containers so that there are no emissions to the atmosphere.

Used abrasives should be removed as soon as practicable after blasting is completed. Waste material generated within the blast room or cabinet should be collected and stored in a secure location before disposal to an approved waste facility.

Abrasive blasting in the open

All abrasive blasting activities should be undertaken on a bunded and controlled surface to prevent soil, water and stormwater contamination.

The structure or item being blasted must be:

- fully enclosed (sides and top) with screening materials, or
- fully screened (sides only) to a height of 2 metres above the structure, and
- blasted in a downward manner where practical.

All used abrasive and waste products generated during abrasive blasting must be contained and securely stored before disposal.

Abrasive blasting in the open will only be allowed with the written consent of the EPA. A licensee must make application to the EPA, unless already permitted by their licence condition, and provide the following information:

- EPA Authorisation number of the company proposing to undertake blasting in the open
- location at which the object or structure is to be cleaned
- name of the occupier of the premises where the object or structure is to be cleaned
- reason for blast cleaning in the open, for example the size or weight of the object or structure
- type of abrasive material to be used
- period of time for which the approval is sought
- separation distance around the blasting site and type of screening if required.

Separation distances for blasting in the open

Dry abrasive cleaning

A minimum separation distance of 500 m is required around the blast cleaning site. If for some reason the 500-metre zone cannot be achieved, consent may be given to a lesser distance, providing the immediate blasting area can be screened with portable screens (tarpaulins, hessian, etc) to contain the dust within the blasting site.

If a minimum separation distance of 100 metres cannot be met, wet blasting must be used.

Wet blast abrasive cleaning

A minimum zone of 100 metres should be provided around a wet cleaning site.

Separation distances may be reduced when:

- physical constraints restrict achieving such distances, and
- the operator can demonstrate that debris, contaminants or noise from abrasive blasting operations will not cause an environmental nuisance.

Lead based paint

The presence of lead based paints on all painted structures must be tested prior to blasting. Representative tests or samples that characterise the whole of the structure being blasted should be conducted and a record of this information retained.

Abrasive blasting locations

Yards, roadways and other working areas should be regularly cleaned and maintained to prevent dust emissions. Water or a proprietary suppressant agent should be used to suppress dust emissions from unsealed yards and roadways resulting from traffic movement during dry weather conditions.

Coating of cleaned materials

For objects cleaned in enclosures see the EPA's Guideline, *Spray Painting Booths—Control of Air and Noise Emissions*.

For objects cleaned outside an enclosure with permission of the EPA, and for fixed structures, air-atomised coating equipment should not be used if the over spray is likely to cause fallout outside of the premises where the painting is being conducted. Preferred methods are airless spray painting, roller or brush painting.

Self-audits

An environmental audit should be conducted every year to ensure that the plant is operating in accordance with its environmental objectives and within legislative requirements. Implementing environmental complaint procedures and training staff to recognise and minimise environmental nuisance or harm are also good ways of achieving on-going plant monitoring.

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

Further information

Legislation

Legislation may be viewed on the Internet at: <www.legislation.sa.gov.au>

Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet
Adelaide Service SA Centre
108 North Terrace
Adelaide SA 5000

Telephone: 13 23 24
Facsimile: (08) 8204 1909
Website: <shop.service.sa.gov.au>

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