



Sandblasting and Other Air-based Blasting

Guidance for generators of blasting waste

What is air-based blasting?

Air-based blasting is the use of a compressed gas (usually air with or without added abrasives) to remove paint, other coatings, or corrosion such as rust from a surface, or to prepare a surface for a new coating. It is often called *sandblasting*, although abrasives other than sand – or no abrasive at all – may be used.

Water-based blasting techniques utilizing pressurized water with or without abrasives also are used for surface cleaning and preparation. Water-based methods are referred to as hydroblasting or power washing. For guidance on water-based blasting, visit the Minnesota Pollution Control Agency (MPCA) at <http://www.pca.state.mn.us/publications/w-hw4-39b.pdf> to view MPCA hazardous waste fact sheet #4.39b, Water-based Blasting.

Environmental concerns

Two main areas of environmental concern are associated with air-based blasting:

1. Dust emissions
2. Debris management and disposal

Air-based blasting can elicit other potential environmental concerns, including noise and process wastewater discharges from dust control sprays. This fact sheet offers guidance regarding the primary Minnesota requirements administered by the MPCA.

Contractors using air-based blasting on structures that might bear lead paint may also be subject to federal requirements of the U.S. Environmental Protection Agency (EPA) under the *Renovation, Repair, and Painting Rule* (RRP). (Lead paint is any paint that contains 0.5% or 5000 parts per million total lead or contains one milligram or more lead per square centimeter of surface area.) For questions about RRP requirements, contact the EPA. (See *More information* on page seven.)

Air-based blasting also raises concerns about employee safety as to impacts to the respiratory system, skin, and hearing. For guidance about protecting employees during air-blasting operations, visit the Minnesota Occupational Safety and Health Administration at <http://www.doli.state.mn.us/mnosha.asp>.

Dust emissions

Two basic dust emission-control requirements apply to all air-based blasting operations, including those at both permanent and temporary sites:

1. Calculating your potential to emit particulate matter into the air
2. Implementing dust control measures

Calculating your Potential to Emit

You must calculate your PTE for each different site where you blast. Results from Potential to Emit (PTE) calculations will determine whether a blasting operation will need an MPCA Air Quality Permit.

To calculate your PTE from blasting operations, you may use the [emissions calculator](http://www.pca.state.mn.us/publications/p-sbap5-19.xls) tool located on the MPCA website at <http://www.pca.state.mn.us/publications/p-sbap5-19.xls>. For help using the calculator, contact the MPCA Small Business Environmental Assistance Program (SBEAP). (See *More information* on page seven.)

*Note: The MPCA's emissions calculator tool will only estimate your PTE. If the estimated PTE is close to a permitting threshold, you may need to use detailed calculations to determine your PTE.

If you will be doing air-based blasting at a site that has other air emissions sources, such as chimneys, stacks, vents, or exhausts, be sure to consider all emissions sources when determining PTE. Also, consider whether the site is already subject to an Air Quality Permit when you calculate the site's total PTE.

Implementing dust control measures

Regardless of PTE calculation results, you must take all reasonable measures to control dust and prevent the release of particulate matter from air-based blasting operations. Such measures may include:

- Permanent enclosures or temporary tenting over equipment being blasted or over the entire area
- Modified-wet blasting (adding only enough water to the air-based blasting stream to capture dust without causing the wetted dust to adhere to the surface being blasted)
- Vacuum blasting (air-based blasting using a nozzle attachment and negative air pressure to capture dust)
- Other dust-control techniques

Constantly monitor the effectiveness of your dust control measures. If dust is released into the air even with the measures you have implemented, you must take additional measures. If environmental conditions (such as high winds) prevent complete capture of particulate matter, you must stop blasting until conditions improve or you apply enough additional control measures to prevent a release.

In addition to these basic requirements, air blasting a structure that may bear lead paint is subject to additional state requirements. **Minnesota's requirements are in addition to those required by the EPA under the RRP.**

Additional Minnesota requirements for residential, childcare and school buildings, and surrounding areas

Use of blasting on a residence, school, or any building built before 1978 in which children are cared for is subject to additional requirements. Buildings that meet this description include houses, home garages and sheds, apartment buildings, hotels, schools, churches, day-care facilities and hospitals. You are also subject to these additional requirements if you intend to use blasting on any structure within 100 feet of these buildings or a playground. However, if you perform only vacuum blasting at a site, you may be eligible for reductions of these additional requirements.

1. Determine whether the building bears lead paint

Assume any painted building built before 1978 bears lead paint until you test or otherwise document that all paint is non-lead. Buildings painted shortly after 1978 may still bear lead paint. *Testing and evaluation* (page four) discusses acceptable testing methods. If you can document that the building does not bear *lead paint* – the paint contains less than 0.5% or 5000 parts per million (ppm) lead* – then you are exempt from the rest of these additional requirements. You must still prevent fugitive dust emissions and comply with debris management and disposal requirements,

which may involve containment and ground cover.

*Note: Although the public health lead paint standard is 0.5% or 5000 ppm, the hazardous waste threshold for total lead in paint waste is 0.01% or 100 ppm. Therefore, paint debris from blasting may still be hazardous for lead content even though the paint was not a lead paint. See *Testing and evaluation* for further discussion.

If you determine or assume that a painted structure you intend to blast bears lead paint, complete the additional requirements numbered two through five below.

2. **Notify surrounding residents**

Deliver written notification at least five days before starting the blasting to:

- the owner and residents of the building(s) to be blasted
- the owner and residents of each residential, child care, or school building within 50 feet of the site

Notification must communicate at least:

- your name and contact information
- the dates and times you intend to do blasting
- an advisory to close and seal doors and windows facing the areas to be blasted, to turn off and seal any fans, vents, or air conditioning units facing the areas to be blasted, to cover all play equipment, and take inside toys, pets, and food and water bowls

Although you do not need to notify the MPCA of blasting activities at this time, some counties or cities may require that you notify appropriate officials when you notify surrounding residents.

3. **Install containment**

Close and seal all windows, doors, fans, vents, and air conditioners on the wall to be blasted, on adjoining walls for at least 50 feet, and on all facing walls of neighboring buildings, out to the distance of the minimum ground cover identified in number four below. If building owners or residents have not closed and sealed these openings, you must either seal them yourself or wait to begin blasting until they are sealed.

4. **Lay ground covering**

Cover all ground with an impermeable covering to a distance of at least 25 feet out from the area(s) you will be blasting. Add 10 feet to this distance for each level to be blasted above the first story. Overlap edges of the covering by at least one-and-a-half feet. If the wall of a neighboring building is less than 20 feet from a wall to be blasted, hang a curtain between the walls that is at least as tall as the shorter wall.

5. **Identify yourself**

From the time you begin blasting until cleanup is completed, post your name and telephone number in letters at least four inches high at the site. You may meet this requirement if your vehicle is marked and always parked at the site during blasting activity.

Additional requirements for steel structures

If you intend to do blasting on a steel structure, you are subject to additional requirements. Steel structures include bridges, water towers, aboveground storage tanks, grain bins, truss towers, railroad cars, barges, and commercial vehicles such as trucks. For a discussion of these requirements, visit the MPCA at <http://www.pca.state.mn.us/publications/5-16.pdf> to view MPCA air quality fact sheet #5.16, [Removing Lead Paint from Steel Structures](#).

Testing and evaluation

If you intend to blast a painted item, you are subject to two separate, but related, requirements:

1. Test or otherwise document that the paint on the item is not lead paint
2. Evaluate the resulting debris to determine whether it is a hazardous waste

You may use the same test or documentation to meet both requirements.

Although lead is the most common contaminant that may cause air-based blasting debris to become hazardous waste, it is not the only one. Both the material to be blasted and the blasting abrasive may contain other metals – any of those listed in Table 1 – that may cause the debris to be a hazardous waste. Toxic solvents and strippers applied to the material before blasting may also cause the resulting debris to be hazardous even if the material did not contain any heavy (Table 1) metals.

If you do not evaluate both the material to be blasted and the blasting abrasive, or the resulting debris itself, you must assume the debris will be hazardous and manage it as a hazardous waste.

Determining whether the item to be blasted bears lead paint

Lead paint is any paint that contains 0.5% or 5000 ppm total lead or contains one milligram (mg) lead or more per square centimeter (cm²) of surface area. Remember to consider all layers of paint on the item you intend to blast. Lead paint underneath topcoats will be released by blasting. Assume that any consumer-grade paint applied before 1978 contains lead. Some commercial and industrial finishes still contain lead, so assume that commercial or industrial-grade paint of any date you intend to blast contains lead until you can show it does not.

If you cannot document that paint is not lead paint, you must test the paint. If you cannot document and do not test, you must meet the lead paint removal requirements numbered two through five on page three and manage the debris as hazardous waste.

Evaluating whether debris will be hazardous waste

Debris from blasting material may be a hazardous waste if the material or abrasive before blasting, including all layers of paint that may be released by blasting, contain metals in the amounts shown in Table 1 or greater. The debris may also be hazardous if you apply any products containing F002, F004, or F005 listed solvents to the surface before blasting. For more information on F-listed solvents, visit the MPCA at <http://www.pca.state.mn.us/publications/w-hw2-00.pdf> to view MPCA hazardous waste fact sheet #2.00, [E List of Hazardous Wastes](#).

Remember: paint that does not contain enough lead to meet “lead paint” criteria may still produce debris that is hazardous because of its lead content. All lead paint will generate hazardous waste debris.

Table 1: Totals thresholds for metal-containing blasting debris

Metal	Percent		Parts per million
Arsenic	0.01%	or	100 ppm
Barium	0.2%	or	2000 ppm
Cadmium	0.002%	or	20 ppm
Chromium	0.01%	or	100 ppm
Lead	0.01%	or	100 ppm
Mercury	0.0004%	or	4 ppm
Selenium	0.002%	or	20 ppm
Silver	0.01%	or	100 ppm

Acceptable test methods

To determine whether paint is lead paint and whether blasting debris is hazardous, you may use any method that will **accurately** measure the total concentration of the Table 1 (heavy) metals. You may not use field 'swab' tests, such as those involving sulfide or porphyrin reactions, even if the EPA allows use of those tests to meet RRP Rule requirements.

Commonly used acceptable test methods include:

- **Acid extraction or total metals**
Use an analytical laboratory for this totals test that measures the total concentration of Table 1 metals in a coating.
- **Toxicity Character Leaching Procedure (TCLP)**
Use an analytical laboratory for this definitive hazardous waste evaluation test, which may also be used to show that a paint is not lead paint. Multiply the results of this test by 20 when comparing to the Table 1 Totals thresholds.
- **X-ray fluorescence (XRF)**
This test uses a portable or laboratory-based radiation source to irradiate the sample material and then measure the spectrum of X-rays it emits. Ensure that the XRF unit and setting you use can detect all of the Table 1 metal constituents that may be contained in the material to be blasted. Take care to calibrate and operate the unit according to the manufacturer's recommendations for the surface and substrate you are testing, and perform and document daily verification tests for each metal for which you are testing.

Selecting an analytical laboratory

The Minnesota Department of Health (MDH) administers a voluntary laboratory certification program. You are not required to use a specifically accredited or licensed analytical laboratory; however, contact the MDH or MPCA if you would like assistance finding an MDH-certified laboratory (see *More information*, page seven).

If you have determined that a material does not bear lead paint, you may choose to do the air-based blasting and then collect and test the debris for all the metals listed in Table 1. Until you have tested and can document it is not hazardous, assume the debris is hazardous and manage it as a hazardous waste. Evaluate debris from each material separately; do not average results or mix blasting debris from different items and then test.

Managing and disposing of debris

Contain, collect, accumulate, and ship off site for proper disposal all debris generated by air-based blasting. All blasting debris is regulated waste. You may not abandon it on any site, use it for fill for driveways, parking lots or anywhere else, or stockpile it outside of a container.

1. **Contain all debris**
Keep blasting debris within the tenting, tarps, or other protective containment you are using. If any debris escapes containment, stop blasting immediately. Right away, collect the debris from unprotected vegetation, grass, soil, parking lots, streets, or other parts of the building you are blasting and then adjust or extend your containment.
2. **Collect the debris**
Collect all debris from your containment area by the end of each working day.

3. Accumulate the debris properly

Accumulate hazardous waste blasting debris in closed, compatible containers labeled with the words "Hazardous Waste" and a description of the waste (e.g., "Hazardous Waste Sandblast Debris"). Secure any hazardous waste blasting debris containers that will not be transported off site at the end of the working day. Accumulate non-hazardous blasting debris in closed containers or other compatible units that will protect it from precipitation and prevent a release of the debris to the environment.

4. Ship the debris off site for proper disposal

Except for lead paint debris from blasting a residence, hazardous waste blasting debris must be shipped for disposal to a permitted hazardous waste Treatment Storage or Disposal Facility (TSDF), or, if you are eligible, to a Very Small Quantity Generator Program (VSQGCP). If you are a contractor air blasting at a temporary site, you may transport your hazardous waste blasting debris back to your base of operations for consolidation and subsequent shipment to a TSDF or VSQGCP for disposal under the MPCA [contractor policy](#). Hazardous waste blasting debris may be recycled as a feedstock provided you follow hazardous waste [feedstock requirements](#).

Contractors may be able to dispose of lead paint debris from blasting a residence at certain municipal solid waste landfills in Minnesota. Contact the landfill first. The landfill operator has the option to reject the material. Contractors need not count lead paint debris from residences towards their regulated hazardous waste generator status. [Homeowners](#) who remove lead paint themselves must manage it as a household hazardous waste. Lead paint debris from any other structure must be disposed of as a hazardous waste.

Manage non-hazardous blasting debris as an industrial solid waste. If you believe the debris may have a beneficial use, you must get approval from the MPCA for your proposed use of that specific material before you reuse it. You may not reuse blasting debris as new blasting abrasive without prior review and approval by the MPCA.

Table 2: Resources

For information on	See
VSQGCPs and programs	<i>VSQG Collection Program Requirements for Generators</i> http://www.pca.state.mn.us/publications/w-hw2-51.pdf
Contractor policy	<i>Managing Hazardous Waste Generated by Construction and Service Contractors</i> http://www.pca.state.mn.us/publications/w-hw3-11.pdf
Recycling – hazardous waste feedstocks	<i>Recycling Hazardous Waste</i> http://www.pca.state.mn.us/publications/w-hw2-42.pdf
Residential lead paint waste disposal	<i>Residential Lead-Paint Waste Disposal</i> http://www.pca.state.mn.us/publications/w-hw4-41.pdf

Using blasting additives

Various products on the market claim to prevent blasting debris from being hazardous when mixed into the blasting abrasive before use or into the resulting debris after blasting is completed. Although Minnesota allows the use of these products, you must still be able to document that the resulting waste is non-hazardous. Due to the inherent variation in paint and abrasive mixtures, you will most likely need an analytical analysis of the final waste mixture to document that it is non-hazardous. Note that the treating effect of some of these products may be temporary. If your treated waste re-exhibits a

hazardous waste characteristic at any time before final disposal, you remain fully responsible for managing it under full hazardous waste requirements. Regardless of the debris status at the time of disposal, you remain liable under the Federal and State Superfund laws for any contamination the debris may cause after disposal.

If you intend to treat your debris after blasting, you must contain, collect, and accumulate the debris in full compliance with the hazardous waste requirements discussed in this fact sheet before treating it.

More information

Guidance and requirements in this fact sheet were compiled from multiple Minnesota Statutes and Rules, including Minn. Stat. §116 and Minn. R. Chapters 7001, 7011, 7025, 7035, and 7045, and incorporates regulatory interpretation decisions made by the MPCA on November 9, 2011. Visit the Office of the Revisor of Statutes at <https://www.revisor.mn.gov/pubs> to review the Minnesota Statutes and Rules directly.

Your metropolitan county and the MPCA have staff available to answer waste management questions. For more information, contact your metropolitan county hazardous waste office or your nearest MPCA regional staff. For information about blasting waste and toxicity reduction and alternatives to air-based blasting, contact the Minnesota Technical Assistance Program (MnTAP).

Metro County Hazardous Waste Offices

Anoka	763-422-7093
Carver	952-361-1800
Dakota	952-891-7557
Hennepin	612-348-3777
Ramsey	651-266-1199
Scott.....	952-496-8475
Washington	651-430-6655
Websites....	http://www.co.[county].mn.us

Minnesota Department of Health

Statewide	651-201-5200
Website	http://www.health.state.mn.us

Minnesota Technical Assistance Program

Toll free.....	1-800-247-0015
Metro	612-624-1300
Website	http://www.mntap.umn.edu

Minnesota Pollution Control Agency

Toll free (all offices).....	1-800-657-3864
Brainerd.....	218-828-2492
Detroit Lakes	218-847-1519
Duluth	218-723-4660
Mankato	507-389-5977
Marshall	507-537-7146
Rochester	507-285-7343
St. Paul	651-296-6300
Willmar	320-214-3786
Website	http://www.pca.state.mn.us

Small Business Environmental Assistance

Toll free	1-800-657-3938
Metro	651-282-6143
Website	http://www.pca.state.mn.us/sbeap/

U.S. Environmental Protection Agency

RRP Program	1-800-424-LEAD [5323]
Website	http://www.epa.gov