

Ambient-air Pumps and Special Air-Flow Requirements for Asbestos

Attention: Employers who remove asbestos and their equipment suppliers: Recent DOSH inspections indicate employers are not providing **at least 6 cubic feet per minute (CFM)** of breathing air to employees who use full-facepiece continuous-flow airline respirators. This minimum flow rate, unique to Washington State, applies when employers decide to use continuous-flow instead of pressure-demand airline respirators during asbestos work inside negative-pressure enclosures.

All jobs inspected used ambient-air pumps to provide breathing air to airline respirator users. These ambient-air pumps are small, portable, low-pressure, rotary-vane air compressors often driven by a ¼- to 2- horsepower electric motor.



If you use this type of system, make sure it provides a 6-CFM air-flow rate to each user, as required by Washington State asbestos rules, WAC 296-62-07715(4).

Why are low flow rates occurring?

Many employers were using the right ambient-air pump, but set up their air supply system to deliver a 4-CFM flow rate instead of the 6-CFM minimum. **The higher 6-CFM flow rate is required to ensure that asbestos contamination stays out of the respirator system at all times during use.**

Some employers were using an ambient-air pump that didn't have enough capacity to meet their expected air-supply needs. A few of the systems set up for multiple users could not meet the 6-CFM minimum, even with air-flow controls adjusted to the maximum setting and one respirator user on the system.

In all cases, DOSH inspectors found that those responsible for setting up and maintaining the air-supply system either did not have an air-flow measurement device (called a rotameter), or did not know how to use one correctly to check the air flow.

How do I make sure my ambient-air pump provides the 6-CFM minimum to each respirator user?

Follow these steps if you decide to use continuous-flow instead of pressure-demand airline respirators for asbestos removal work inside negative-pressure enclosures:

1. When purchasing NIOSH-approved respirators, consider features that optimize air-flow:
 - When respirator manufacturers offer more than one hose size (internal diameter), choose the larger size.
 - Use larger-diameter ($\frac{1}{2}$ inch) quick-disconnect fittings, when available
 - When possible, choose a single longer hose instead of 2 or 3 shorter hoses to minimize the number of hose connections per user. **Make sure replacement hoses and other respirator parts are made by the same manufacturer and verify they are part of the manufacturer's NIOSH-approved configuration.**
2. Before choosing an ambient-air pump, check the **operating-pressure range tables** in the respirator user's manual and pick out the 'psi' (pound per square inch) value that will apply to **all** respirator configurations you'll use. This will ensure the air pump you choose can handle the respirator configuration with the longest air-line, most connections, and smallest diameter hoses.

Caution: Don't pick a psi value that is in the lower to middle operating pressure range given for a particular respirator configuration. These values typically *will not* provide the minimum 6-CFM required flow rate. Instead, you should pick a higher psi value (up to the maximum psi value in the applicable operating-pressure range).

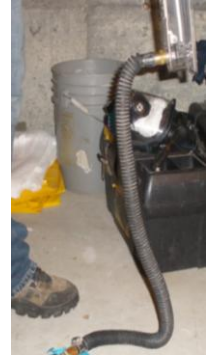


Rotameters like these can quickly show you whether the 6 CFM minimum air-flow rate is being met.

3. When choosing an ambient-air pump, review its specification sheet to confirm the:
 - **Maximum working pressure** (in psi units) is at least as high as the psi value you picked when following step “2”; and
 - **CFM output** is high enough to provide the 6-CFM minimum air flow to each respirator user connected to the pump. For example, if you expect the ambient-air pump to supply breathing air to a maximum of 3 respirator users at a time, make sure the CFM output value listed is at least 18 CFM (3 users X 6 CFM per user = 18 CFM).
4. Provide a rotameter, scaled to measure up to (or beyond) 6 CFM (or SCFM). Follow the manufacturer’s specifications for maintenance and calibration.
5. Provide a written procedure on how to properly test and adjust the air pump’s working pressure to ensure the 6-CFM minimum. See “Other Resources” below for a sample procedure.
6. Follow written procedures to test and adjust the air flow to provide the 6-CFM minimum before employees use the system. Document the operating pressure needed for each system configuration so the information is easily available and useful to others when needed at the job site.
7. Train individuals who supervise respirator use and respirator users on your written procedures.
8. Check the psi gauge on the ambient-air pump to verify the operating-pressure is right for the respirator configurations to be used. As a best practice, do this when you set up the system and each time you move it to another location, add or remove hoses or users from the system, or make other changes that could affect the system’s air-flow demands.
9. A low “psi” reading on the ambient-air pump’s pressure gauge may signal worn parts and other system problems. Remove the pump from service if it can’t provide the required psi.
10. Share this Hazard Alert with equipment suppliers and others in your safety network.



A



B

Which photo shows the correct rotameter connection?
See the answer at the end of “Other Resources”.

Other Resources

- To find asbestos-related rules, training materials, videos, and other resources, find [Asbestos](#) information on L&I’s [Safety website](#). A sample procedure, [How to Check Air-Flow Rates Provided by Ambient-Air Pumps Used for Asbestos Work](#), is provided with this Hazard Alert for your convenience.

How can I get help from Labor & Industries?

The Department of Labor & Industries provides [Safety & Health or Risk-Management Consultants](#) to help you identify hazards and solutions at no-charge. Call 1-800-423-7233 to schedule a confidential consultation or visit a local [L&I office](#) and ask for the consultation supervisor.

Answer: B

*This alert was developed by L&I’s Division of Occupational Safety and Health (DOSH) to alert employers, labor groups, and employees to potential hazards associated with work activities. **This is not a rule and creates no new legal obligations.** The information provided includes suggested guidance on how to avoid workplace hazards and describes relevant mandatory safety and health rules. DOSH recommends you also check the related rules for additional requirements.*

Hazard Alert Inside