



## Technical Information

### Breathing Air Supplies for Abrasive Blasting

The respirators used for abrasive blasting are called Supplied air systems. They do not require fit testing, and may be used with facial hair, since the respirator is maintained slightly above atmospheric pressure and requires no seal to the wearer's face. Many options exist for breathing air sources for abrasive blasting. First let's consider the basics. Breathing air must contain 20.4% Oxygen, less than 10PPM of Carbon Monoxide, be odor free, and have sufficient moisture to prevent drying of the lungs, but low enough that it does not fog respirator window. It is referred to as grade "D" breathing air.

Air must enter the respirator at slightly above atmospheric pressure, with sufficient volume that exhaled air is replaced by respirable air. The respirator for most blasting is known as a "Type CE" and must have a front bib or cape to protect the front of the body. An inner cape is frequently tucked into the wearer's coveralls cooling the body with excess cooled air.

The air supply may be a lubricated portable compressor, an oil free compressor or a "free air pump" Most blasters prefer high pressure supplies which support the use of a belt mounted vortex air conditioner. The air requirement for this system is 25 CFM @ 100 PSI. High pressure air supplied by a portable compressor must be filtered through a multiple stage filter system which removes water, oil, volatiles and odor. I strongly recommend the installation of a carbon monoxide (CO) monitor to constantly monitor the air being breathed.

A free air pump does not require a CO monitor, however the operator must assure that there are no sources of CO near the pump. Free air pumps usually run on 115Volt power systems, are compact and reasonably inexpensive. produce warm air. The air can be cooled by running it through a copper coil installed in an ice chest. (the poor man's air conditioner).

Hoses and fittings used for breathing air should never be used for any other purpose. Respirators are considered personal equipment, and should not be shared unless completely disinfected. A respirator worn by a cigarette smoker will be very unpleasant for a non-smoker.

Mr. Sandman Inc. can supply all types of air supplies, filters and monitors, and sells the RPB Nova blasting respirators.

The following are references to government documents which apply to use of breathing air

1910.134(i)(1)(ii)

Compressed breathing air shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:

1910.134(i)(1)(ii)(A)

Oxygen content (v/v) of 19.5-23.5%;

1910.134(i)(1)(ii)(B)

Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

1910.134(i)(1)(ii)(C)

Carbon monoxide (CO) content of 10 ppm or less;

1910.134(i)(1)(ii)(D)

Carbon dioxide content of 1,000 ppm or less; and

1910.134(i)(1)(ii)(E)

Lack of noticeable odor.

1910.134(i)(5)

The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:

1910.134(i)(5)(i)

Prevent entry of contaminated air into the air-supply system;

1910.134(i)(5)(ii)

Minimize moisture content so that the dew point at 1 atmosphere pressure is 10 degrees F (5.56 deg.C) below the ambient temperature;

1910.134(i)(5)(iii)

Have suitable in-line air-purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer's instructions.

1910.134(i)(5)(iv)

Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

1910.134(i)(6)

For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

1910.134(i)(7)

For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, 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.

1910.134(i)(8)

The employer shall ensure that breathing air couplings are incompatible with outlets for nonrespirable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

1910.134(i)(9)

The two most important breathing air standards are the Occupational Safety and Health Administration (OSHA) and the Canadian Standards Association (CSA).

In its published requirements [29CFR1910.134(d)(1)], OSHA states that compressed "breathing air shall meet at least the requirements of the specification for Grade D air as described in the ANSI Compressed Gas Association Commodity Specification for Air, G-7.1-1989."

In 1989, the Compressed Gas Association revised G-7.1. In the 1989 version, the allowable carbon monoxide level for Grade D air was reduced from 20 to 10 ppm. See the table below for the maximum allowable levels. You should check with your local OSHA office to verify its interpretation on this point. The CSA standard, Compressed Breathing Air Systems CAN3-Z180.1-00, also contains specification for the quality of compressed breathing air.