

# Compressed Air Safety

By Warren K. Brown, CSP, ARM, CSHM  
Chair of Board Institute for Safety and Health Management

## Before you begin

Review the material shown here as well as the resources so you have a better understanding of the subject and the sequence of topics. Have a few compressed air examples for group discussion.

## What you will learn

1. The dangers encountered when using or being exposed to compressed air.
2. Air supply system design and maintenance issues.
3. General use rules for compressed air activities.

## Introduction

Compressed air is sometimes characterized as the fourth utility following water, electricity and natural gas. It is present in industrial, commercial, and agricultural settings and many do-it-yourselfers use it off the job as well. Since air is a compressible fluid it can be very dangerous when and if there is an uncontrolled eruption. The effects on the human body can be catastrophic which means all perceivable precautions must be exercised during its use.

## Discussion

**Air Danger:** The danger associated with compressed air is often not recognized and air is often perceived as harmless. This is far from reality. Some examples of the types of injury that might result are:

1. Air may be forced through the skin and could result in an air embolism with potential fatal results
2. Air blown at the ears or eyes can result in ruptured ear drums and dislodged eye balls. Particles can be embedded in the ear and eye as well.
3. The noise level of exhausting air can reach levels that may result in damage to a person's hearing.
4. Particles may be accelerated to a velocity that can result in injury to almost any part of the body.

**Air Supply:** The air supply system generally consists of some type of compressor, storage tank and piping to get the air to the point of use along with valves, regulators and gauges. The storage tank or air receiver must be hydrostatically tested and so noted on the tank. Airlines must be designed to handle the pressures that are expected to be encountered. Hoses must be maintained and protected from damage. They should be inspected periodically to assure their integrity. Pressure regulators and valves must be located in positions that fit the job. Storage tanks must have a drain, gauge and valve and the tank must be located where these devices are readily accessible for the regular inspections required.

### General use rules:

1. Never point an airline at the skin or another person. Attempting to clean particles or dust off a human body must never be done.
2. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and appropriate PPE according to OSHA.
3. Utilize adequate hearing protection to protect against noise levels being encountered.
4. Fittings and clamping devices must be designed for the pressures expected to be encountered according to OSHA. An air hose that has come loose from the fitting can whip around and be a serious hazard.
5. Hoses must be kept in good condition and protected from damage during use. Keep hoses off the floor as possible tripping hazards. Coil the hoses and hang on hooks or use hose reels where practical.

- 6 Properly designed nozzles that assure the dead head pressure is less than 30 psi must not be modified in any way that might allow the dead head pressure to exceed 30 psi. The control trigger must not be taped or otherwise rendered constantly on.
7. There should be a shutoff valve within easy reach of the operator using the airline.

### Quiz

1. Never point a compressed air gun or hose at yourself or another person. T F
2. The dead head pressure of a blow-off nozzle must not exceed 30 psi. T F
3. Taping or wiring open a compressed air blow gun is an acceptable practice. T F

Answers: 1.T; 2.T; 3. F

## Group activities

Have employees do a walk around inspection of their work area looking for potential compressed air hazards. Schedule time for a group discussion of their findings and solutions proposed for each hazard identified. Conduct a follow up inspection to verify that the hazards have been corrected.

## Conclusion

1. Compressed air systems must be designed for the pressures expected.
2. Use the proper PPE which should include eye protection and hearing protection. No horseplay can be tolerated when using compressed air.
3. Inspect the compressed air system regularly and after performing a proper lockout procedure repair any defects before continuing the job.

## References

- NSC Accident Prevention Manual
- OSHA 29CFR 1910.242(b) and 243(b)(2)
- Compressed Air Safety—<http://www.ehs.ufl.edu/programs/os/shop/compair/>
- Toolbox Safety Talks-High pressure Air—[http://safety.cat.com/cda/files/836625/7/High%20pressure%20air\\_V0111.1.pdf](http://safety.cat.com/cda/files/836625/7/High%20pressure%20air_V0111.1.pdf)
- Compressed Air the Fourth Utility-<http://compressed-air.squarespace.com/journal/2011/5/12/compressed-air-safety.html>

### Author

Warren K. Brown, CSP, ARM, CSHM, retired from GM/Delphi; elected ASSE Region VII vice president; ASSE vice president of Professional Development; president of the ASSE 2008-2009; named an ASSE Fellow in June 2011. Past chair of BWC Machine Shop Section; past chair of the National AIHA Confined Space Committee; BS in Industrial Technology from Ohio University, MBA from the University of Dayton; named a General Motors "Safety Fellow"; the highest General Motors individual safety award.