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An air compressor exploded, destroying a room and blowing a hole in a concrete block wall.



There are basically three commonly used energy sources for industry. **Compressed Air (Fluid Power), Hydraulic (Fluid Power) and Electrical**. Compressed air is deceptively hazardous so clear communication to your employees is essential in preventing incidents related to compressed air. Compressed air devices are put to use for many tasks, including cleaning and maintaining machinery, workshops, floors, walls and ceilings. Some workers also use compressed air devices to remove dust or other debris from their clothing. This bad habit is deeply rooted with workers although it should be corrected.

**Did you know...**

- Air forced into the tissues or blood stream via the skin can cause an air embolism, which can be fatal if it reaches the heart, lungs or brain.
- Air can enter the body through the pores of the skin
- Inflation injuries of the intestine can be caused by air being directed at the anus.

**This act of horseplay can cause death.**

- Air blown into the mouth can, at merely 5 psi, rupture the esophagus, or the lungs.
- Eye and ear injuries can occur from a blast of air or flying particles. These types of eye and ear injuries can cause blindness and deafness.

The sound from a compressed air hose can reach **120-130 decibels**, which is well above 80 dB permissible exposure limit, **40 psi** can blow out an ear drum 4 inches away from the ear, and possibly cause brain damage. As little as **12 psi** can blow an eye out of its socket

Pneumatic tools are powered by compressed air. Common types of these air-powered hand tools that are used in industry include buffers, nailing and stapling guns, grinders, drills, jack hammers, chipping hammers, riveting guns, sanders and wrenches.

With compressed air you can rough or fine finish the surface of a piece of woodwork or smooth weldments in steel with an air sander or grinder.

Compressed air use is everywhere.

Compressed air can be carried anywhere with an appropriate pressure vessel - sometimes called an air hog or air pig. And as mentioned earlier, compressed air is relatively safe in that it's non-flammable. When you spill compressed air, it doesn't make a mess!



**REMEMBER:**

- Hoses and lines should always be rated to meet the maximum operating pressure of the equipment.
- Wear proper Personal Protective Equipment: – Safety glasses with side shields, *and* preferably a face shield – Hearing protection – Respiratory protection, depending on the materials being worked with
- Never use compressed air to clean clothing or hair.
- Never point compressed air at yourself or another person.
  1. Turn off the air pressure to hose when not in use or when changing power tools.
  2. Do not carry a pneumatic tool by its hose.
  3. Avoid creating trip hazards caused by hoses laid across walkways or curled underfoot.
- **Normal work clothing is not a protection against compressed air.**

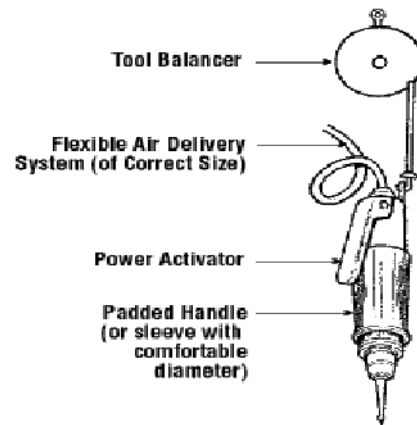
**Employers should not allow employees to use compressed air for cleaning themselves or their clothing in general industry situations. The eyes and other body parts, such as the respiratory system, may be damaged as the result of inadequate personal protective equipment, lack of chip guards, and/or uncontrolled release of compressed air.**



Use only the attachments that the manufacturer recommends for the tools you are using.

Be careful to prevent hands, feet, or body from injury in case the machine slips or the tool breaks.

Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible.



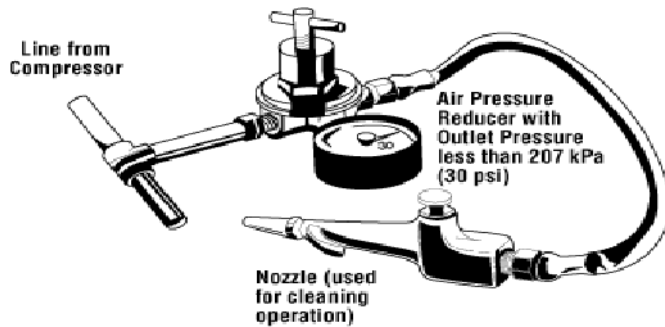
### How should you handle air hoses?

- Use the proper hose and fittings of the correct diameter.
- Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.
- Choose air-supply hoses that have a minimum working pressure rating of 1035 kPa (150 psig) or 150% of the maximum pressure produced in the system, whichever is higher.
- Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.
- Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.
- Make sure that hose connections fit properly and are equipped with a mechanical means of securing the connection (e.g., chain, wire, or positive locking device).

### What should you **avoid** with a **compressed air**?

- **Cleaning with compressed air is dangerous.**
- Do not use compressed air for cleaning unless no alternate method of cleaning is available. The nozzle pressure **MUST** remain below 207 kPa (30 psi). Personal protective equipment and effective chip guarding techniques must be used.
- Two acceptable methods of meeting the "below 207 kPa (30 psi)" requirement are illustrated below.





**Emphasize the hazards.** With all the important safety issues on your training agenda, compressed air safety might not seem like a pressing problem. But it is a very real hazard, and it certainly deserves attention--especially since most of your workers probably don't think compressed air is dangerous.

Basically, there are three hazards associated with compressed air: air pressure, flying particles, and noise.

- Air under a lot of pressure can penetrate the skin, causing hemorrhaging and pain. If compressed air gets into the body through cuts in the skin, an air bubble (embolism) could form in the bloodstream, and that could kill a worker if a bubble gets to the heart or lungs. Furthermore, compressed air entering the body through the mouth or nose can cause injury to internal tissues and organs. Compressed air that hits an eye can blow the eyeball from its socket, and compressed air blown into an ear can rupture the eardrum.
- Air pressure of 40 pounds can drive chips and other particles into the eyes and face with the force of shrapnel. Flying particles can also cause cuts and bruises to other parts of the body.
- Compressed air is noisy, too. Noise levels can sometimes reach or exceed 120 decibels.

Compressed air can be very dangerous especially if it contains particles of dirt and sand. A compressed air pipe burst and the dirt was practically injected into the skin and had to be removed carefully.



**Make sure your workers wear essential personal protective equipment (PPE).** It's a safe bet that some of your employees probably don't think about the need for PPE when they use compressed air. And yet it's essential for preventing the kinds of injuries just identified.

## **T R A I N I N G ----- T R A I N I N G ----- T R A I N I N G and more T R A I N I N G**

**Focus on safe work rules.** Your compressed air safety training should include:

- Make sure the line you're working with is an air hose, not a gas or water line. (Sometimes hose lines cross and a worker could be fooled.)
- Inspect the hose to make sure it's in good condition and properly connected.
- Keep air hoses off the floor where they can be tripping hazards or become damaged.
- Prevent sharp objects from rubbing against air hoses.
- Always coil the hose--without kinks--when it's not in use and hang it over a broad support, not on a hook or nail.
- When you have a choice of pressure, use the lowest pressure that will do the job.
- Never point an air hose or air gun at anyone--including yourself.
- Choose a safer, better way to clean dust from your clothes, such as a brush or vacuum.
- **Don't fool around when using an air hose. It's a tool that should be used with caution, not a toy for engaging in horseplay.**

Always and never forget: compressed air itself is also a serious hazard. On rare occasions, some of the compressed air can enter the blood stream through a break in the skin or through a body opening. An air bubble in the blood stream is known medically as an embolism, a dangerous medical condition in which a blood vessel is blocked, in this case, by an air bubble. An embolism of an artery can cause coma, paralysis or death depending upon its size, duration and location. While air embolisms are usually associated with incorrect diving procedures, they are possible with compressed air due to high pressures. While this seems improbable, the consequences of even a small quantity of air or other gas in the blood can quickly be fatal.

**Do not forget the T R A I N I N G ASSOCIATED WITH Using pneumatic tools safely:**

- Read the manufacturer's instructions
- Wear safety glasses
- Set up screens around the work area when there may be flying chips or fragments
- Keep your tools clean
- Do not use an air hose that leaks (replace it)
- Wear hearing protection
- Stop using a pneumatic tool if it leaks air. Have tool serviced or replaced
- Never point the tool at others
- Disconnect the tool before attempting to fix jams.