

Compliance Cheat Sheet: OHS Requirements for Compressed Air Construction Work



What's At Stake

Work carried out in a compressed air environment is highly dangerous. In addition to fire and explosion, working in compressed air exposes workers to health risks, the most common of which include:

- Barotrauma, or direct damage to the ears, sinuses and lungs due to a change in surrounding pressure;
- Decompression illness, typically manifested as pain around the joints, but which can also be a potentially life-threatening condition affecting the central nervous system, heart or lungs; and
- Dysbaric osteonecrosis, a long-term, chronic condition damaging the long bones, hip or shoulder joints.

OHS Regulation of Compressed Air Construction Work

While compressed air work is most commonly associated with underwater diving, tunneling, caisson and other kinds of construction work operations are also carried out in compressed air, including tunneling and caisson. Yet, while all jurisdictions have OHS regulations specifically covering diving operations, 5 jurisdictions don't have specific regulations for compressed air construction work (FED, AB, NL, QC and YK). Among the 9 provinces and territories that do have such regulations, there are 3 basic approaches: (Click here to see the compressed air construction work rules of your jurisdiction.)

1. Incorporation of CSA Standards

BC, NB, NS and PEI say that compressed air construction work must meet a version of the CSA standard CAN/CSA Z275.3, *Occupational Safety Code for Construction Work in Compressed Air*.

2. Imposition of Similar Requirements

Rather than incorporating CSA Z275.3 by reference, ON, SK, NT and NU lay out requirements that are similar to but not exactly the same for construction work

in compressed air.

3. Hybrid Approach

Manitoba follows a hybrid approach that incorporates the CSA standard but also imposes some additional requirements for compressed air construction work.

The 15 Things to Include in Your Compressed Air Construction Work Policy

Although the CSA rules differ slightly from the jurisdiction-specific requirements of ON, MB, SK, NT and NU, there are 15 basic elements every compressed air work safety policy for construction (as opposed to diving) operations should include. (Click [here](#) for a Model Policy that you can adapt for your workplace.)

1. Key Definitions

The first thing to define is “compressed air.” Although you can also do it by “kilopascals” (kPa), a metric that measures air pressure relative to atmospheric pressure (7 kPa, or 1 psi would likely be the standard), it’s much simpler and more precise to define “compressed air” as air whose pressure has been mechanically raised to more than atmospheric pressure. Other key definitions in a compressed air work policy include:

- **“Air lock,”**e., a chamber designed for the passage of persons or materials from one place to another place with a different air pressure;
- **“Maximum air pressure,”** which in the context of compressed air work, means the greatest level of air pressure to which a worker is exposed for a period of over 5 minutes; and
- **“Work chamber,”**e., a part of a site for compressed air work other than an air lock or medical lock.

[Policy, Sec. 2].

2. Workers Your Policy Is Designed to Protect

Compressed air work may take place at your site under the control of a prime contractor or constructor (which we’ll refer to as “prime contractor”) in charge of OHS compliance and safety for the project. Accordingly, you want to make it clear you’re your policy is intended to protect not just your own company’s full- and part-time employees but also:

- Temporary employees placed by an outside agency who work at your site (of course, those temps shouldn’t be allowed to work in compressed air unless and until they receive the required training and medical exams); and
- Contract labourers hired to perform compressed air work at your site, including workers overseen by a prime contractor.

[Policy, Sec. 3]

3. Pre-Work Notification

Five jurisdictions (ON, MB, SK, NT, NU) require the employer and/or prime contractor to notify the OHS regulatory authority within a stated deadline,

typically 30 days, before starting construction-related compressed air work. In addition:

- Ontario requires the prime contractor to notify the police, fire department and nearest hospital;
- Sask requires notification and certification from a professional engineer;
- NT and NU require notification, engineer certification and certification from a physician competent to practice hyperbaric medicine.

So, if you're in one of these 5 jurisdictions, make sure your policy provides for the required notification [Policy, Sec. 4].

If You're in Ontario: Superintendent

If you're subject to Ontario OHS regulations for construction projects, make sure your policy provides for designation of a competent person to serve as superintendent for the project site whose responsibilities include instructing workers of the hazards of compressed air work and the necessary health and safety precautions to be taken [Policy, Sec. 5]

4. Designation of Lock Tender

It's advisable (and in Ontario, mandatory) to require that for each shift at least one competent worker be designated to serve as lock tender to attend to the controls of an air lock. There should also be at least one competent worker capable of performing the duties of a lock tender available to act as a backup in an emergency [Policy, Sec. 6].

5. Mandatory Badges

The policy should require workers to wear for at least 24 hours after working in compressed air a sturdy metal or plastic badge of at least 50 millimeters in diameter provided by the employer or prime contractor that lists:

- The employer or prime contractor's name;
- The examining physician's name and telephone number;
- The location of a medical lock at the site; and
- The words, "*compressed air worker ' in case of decompression sickness take immediately to a medical lock*".

[Policy, Sec. 7].

6. Communications Systems

There must be a system of communicating with workers while they're in a compressed air environment. Ontario specifically requires the system to include:

- A phone in every air lock and work chamber, and adjacent to every compressor plant [Policy, Sec. 8.1];
- A bell or buzzer located in every air lock, every work chamber near a door leading to an air lock and near every lock tender's work position [Policy, Sec. 8.2]; and
- A standard set of signals for bell and buzzer communications posted next to each switch [Policy, Sec. 8.3].

7. Fire Prevention Measures

Your policy should provide for implementation of fire prevention measures, including:

- Bans on smoking, use of acetylene and storage of combustible materials in work chambers and air locks [Policy, Sec. 9.1];
- Requirement that fire hoses, fire watches, fire extinguishers and other measures be in place before introducing a flame-cutting, gas-welding or similar source of ignition into a work chamber in the vicinity of a combustible material [Policy, Sec. 9.2]; and
- Mandatory installation of standpipes in each air lock and work chamber [Policy, Sec. 9.3].

8. Medical Exams

Workers should not be asked or allowed to work in compressed air unless and until a physician competent in bariatric medicine examines them and certifies their physical fitness for such work using the "Record of Compressed Air Worker," i.e., Figure 1 of CSA Z275.3. In Ontario, employers must designate at least one such physician to act as "project physician" in charge of administering or supervising testing of all compressed air workers at the project. Most jurisdictions require the employer to pay for the exam and credit the worker's time in having the exam, including travel time, as payable work time [Policy, Sec. 10].

9. Medical Locks

In addition to the usual first aid rooms and facilities, there must be one or more appropriately located medical locks, i.e., air chambers with airtight doors at one end and closed at the other where workers may undergo air pressure changes for medical purposes. Make sure your policy provides for medical locks to meet the engineering specifications and have the medical equipment your jurisdiction's OHS regulation or the CSA standard requires [Policy, Sec. 11].

10. Standards for Compressors, Air Locks & Work Chambers

Require compressors, air supply equipment, air locks and work chambers to meet the standards set out in the OHS regulations or CSA standard. Thus, for example, several jurisdictions require employers to ensure that supplied breathing air meets CSA CAN/CSA-Z180.1, *Compressed Breathing Air and Systems* [Policy, Sec. 12].

11. Work & Rest Periods

Specify how long a period workers subjected to compressed air are allowed to work and the minimum amount of rest they must get between work periods, depending on the air pressure in which they work. The chart below lays out the standard limits.

Compressed Air Work Maximum Working Periods & Minimum Rest Periods

Column 1: Air pressure for one working period	Column 2: Max. hours of work per 24 hours	Column 3: Max. hours of work, first period	Column 4: Min. hours of rest, first period	Column 5: Max. hours of work, second period	Column 6: Min. hours of rest, second period

<96 kPa	7.5	3.75	1.25	3.25	0.25
≥96 kPa and <138 kPa	6	3	2.25	3	0.75
≥138 kPa and <180 kPa	4	2	3.5	2	1.5
≥180 kPa and <220 kPa	3	1.5	4.5	1.5	1.5
≥220 kPa and <262 kPa	2	1	5	1	2
≥262 kPa and <303 kPa	1.5	0.75	5.5	0.75	2
≥303 kPa and <345 kPa	1	0.5	6	0.5	2

Workers aren't allowed to work or engage in any physical exertion during rest periods [Policy, Secs. 13 + 14 (which is based on Ontario laws)]

12. Decompression Requirements

The policy must include measures to ensure workers subjected to compressed air are safely decompressed to atmospheric levels, including the requirement that the rate of decompression follow the rate tables listed in CSA Z275.3 [Policy, Secs. 15 + 16].

13. Safe Work Procedures

The policy should list the employer's commitment to develop and implement safe work procedures for compressed air work and enforce those procedures, including via the imposition of discipline [Policy, Sec. 17].

14. Training & Education

Training must be provided by a qualified person before a worker is allowed to perform compressed air work and address:

- Health hazards of working in compressed air;
- Applicable safe work procedures;
- Hazard controls in effect;
- The communications systems; and
- Decompression procedures.

Training should be reinforced or repeated after workers commit violations or otherwise indicate that they no longer understand or are capable of applying their safety training [Policy, Sec. 18].

15. Monitoring

Last but not least, provide for reviewing your policy at least once a year and on an immediate basis in response to significant changes in work circumstances or conditions and/or incidents and other red flags suggesting that the policy

isn't working and needs to be reviewed. You may have to perform such review in consultation with your JHSC or health and safety representative, depending on your jurisdiction's OHS laws [Policy, Sec. 18].