This Alert highlights the need to maintain compressor equipment to prevent explosive rupture of the air receiver tank.

Recently an air receiver of a compact air compressor unit exploded in a panel-beating workshop, narrowly missing an employee and causing material damage.

Compressors of this type are commonly used in smaller businesses, like automotive repairers, for spray painting, vehicle hoisting and other applications.

Although there was corrosion on the inside surface of the cylinder, the explosion was probably due to poor maintenance of the air supply line.

**How can an air receiver tank explode?**
During operation, deposits of lubricating oil tend to build up in the line supplying compressed air from the compressor cylinder to the air receiver. As the diameter of the supply line decreases, the already high temperature of the compressed air rises further to a point where it is possible for the contaminant to ignite.

Sparks are then carried into the air receiver where oil from the compressor, which is often present as a mixture with air in the air receiver, burns explosively. As the pressure relief valve is not designed for such an event, rupture of the air receiver vessel is likely to occur. In other air compressor accidents, static electricity sparks have also been identified as a source of fires and explosions.

**Prevention measures**
To avoid such incidents and damage, all air compressor equipment should be maintained in a safe operational condition and be regularly inspected. To prevent excessive fouling of compressed air supply lines, only the grade of oil recommended by the manufacturer/supplier should be used in the compressor.

**Maintenance**
A good maintenance program for compressor equipment should include checking the condition and operation of the following parts:

- **compressor pump and motor:**
  - Pump and other seals
  - Exhaust valve
  - Belt guard (if applicable)
  - Drive belt
  - Oil separator/filter, and
  - Discharge pipe

- **receiver:**
  - Physical internal condition. This may require a general clean out and a hydraulic test (as specified in Australian Standard AS/NZS 3788 - 2001: Pressure equipment - In-service inspection) or Magnetic Particle Testing if applicable
  - Checking and maintenance of relief and drain valves and pressure gauges

- **electrics** (to be performed by an electrician or person competent in electrical testing):
  - Earth connection and adequacy of insulation
  - Contacts in the pressure switch
  - Electronic controller, if applicable. Newer compressors are fitted with electronic controllers that include pressure switches in them

Note: The above list is by no means exhaustive and may need to include other items according to the particular type, brand and model of the compressor unit.

**Inspection**

AS/NZS 3788 should be used for guidance on conducting an inspection of air-receivers. In general, the extent of the inspection and how often inspections should occur should be sufficient to assure proper functioning of the pressure equipment. A good inspection program will include:

- Using supportive testing and examination methods; e.g. owners of air compressors should follow maintenance and testing recommendations of the manufacturer or supplier of the compressor and ancillary equipment
- Keeping maintenance and inspection records of all registered plant
- Making use of experience gained personally and from other sources
- Checking supplied test results or previous inspections

AS/NZS 3788 also provides guidance on the assessment and repair of defects.

**Legal requirements**

The *Occupational Health and Safety (Plant) Regulations 1995* require employers to maintain and inspect plant to ensure that health and safety risks associated with the use of that plant are eliminated or reduced as far as practicable (refer Regulation 708 for details).

**Further information**

**Acts & Regulations**

- Occupational Health and Safety Act 1985
- Occupational Health and Safety (Plant) Regulations 1995


If you only want to view the legislation you can use the Parliament of Victoria web site; go to

**Standards Australia**

- AS/NZS 3788 - 2001: Pressure equipment - In-service inspection
- AS 4037 - 1999: Pressure equipment and testing
- AS 4343 - 1999: Pressure equipment – Hazard levels

Copies of standards can be obtained by contacting Standards Australia on 1300 654 646 or by visiting the web site at [www.standards.com.au](http://www.standards.com.au).

**WorkSafe Victoria**


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