

Gas cylinder ruptures at filling station

This Alert warns of the dangers of returning damaged high pressure, aluminium alloy gas cylinders to gas suppliers without informing the supplier of the damage.

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Summary

This Alert follows a recent incident at a gas supplier's facility where an 'E' size (24-litre water capacity) cylinder ruptured during re-filling. Damage to the cylinder had been disguised by a user, resulting in the rupture which could have caused injury or death.

Gas cylinders of this type are used by a large number of workplaces such as hospitals, metal trades, automotive panel repair workshops and construction sites.

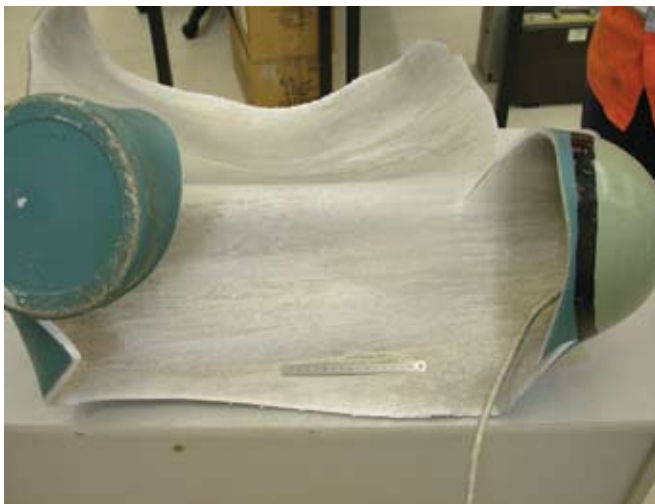
Background

The cylinder was subjected to a standard pre-fill inspection procedure. During re-filling, the cylinder ruptured. Cylinders were dislodged from the filling rig and damage was caused to the area. Fortunately no-one was injured.

The cylinder was being filled with an-argon-based mixture which is an inert gas used for welding and other purposes. An explosion and fire could have resulted if it had been filled with a flammable gas.

The supplier engaged an independent metallurgist to evaluate the ruptured cylinder. It was found that:

- the heat tag around the neck ring of the cylinder had been replaced. A heat tag is a plastic indicator that melts when a cylinder is exposed to excess heat, such as being near a furnace or from being in a fire



- the cylinder had been abraded and repainted
- the mechanical strength of the cylinder was less than half of that required by Australian Standard AS 1777-2005: *Aluminium cylinders for compressed gases - Seamless - 0.1 kg to 130 kg*
- there was a uniform reduction in hardness throughout the cylinder.

It was concluded that the cylinder had been damaged by exposure to high temperature during use or while stored. A user had disguised the damage by replacing the heat tag and repainting the cylinder.

Following the incident, the gas supplier is reviewing its pre-fill inspection process and the type of heat indicator it uses to avoid further incidents.

Recommendations

Recommendations to users:

Any tampering with high pressure, aluminium alloy gas cylinders is dangerous and can cause injury or death and damage property.

Users should follow the gas supplier's instructions for safe use. These include:

- storing cylinders in a cool, well ventilated area, away from heat and ignition sources and combustible materials, especially if cylinders contain flammable gases
- never using cylinders with damage to the shell (burn marks, bulging, surface gouging or dents). Where the supplier fits a heat sensitive tag, do not use the cylinder if the tag has been deformed. This is an indication that the cylinder may have been damaged from exposure to heat. Clearly mark such cylinders and return to the gas supplier or their retail outlets for inspection.

Users should inform gas suppliers of any damage to cylinders that occurred at their workplace.

Other good practices for users include:

- storing cylinders upright. Secure and locate cylinders away from pedestrian or vehicle thoroughfares
- moving cylinders securely with an appropriate trolley. Ensure the valve is closed before moving

- wearing personal protective equipment (safety shoes, glasses and gloves) when handling and connecting cylinders
- securing full and empty cylinders and keeping them separate
- keeping ammonia-based leak detection solutions, oil and grease away from cylinders and valves
- reading the labels and Material Safety Data Sheet (MSDS) before use
- never using force when opening or closing cylinder valves.

Recommendations for gas suppliers:

When inspecting and maintaining these types of cylinders, gas suppliers should ensure:

- inspection and maintenance is in accordance with AS 2030.1-1999: *The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases - Cylinders for compressed gases other than acetylene*
- the extent of the inspection and how often inspections could occur is sufficient to assure proper functioning of the equipment.

Gas suppliers need to be aware that damage to high pressure, aluminium alloy cylinders could be disguised. They need to take all reasonably practicable steps to ensure damage is detected during pre-fill inspection.

In the event of the rupture of a high pressure, aluminium alloy cylinder during refilling, gas supplier employers must ensure the health and safety of employees involved in the task is protected.

Further information

Australian Standards

AS 2030.1-1999: *The verification, filling, inspection, testing and maintenance of cylinders for storage and transport of compressed gases - Cylinders for compressed gases other than acetylene*

AS 2337.1-2004: *Gas cylinder test stations - General requirements, inspection and tests - Gas cylinders*

AS 1777-2005: *Aluminium cylinders for compressed gases - Seamless - 0.1 kg to 130 kg*

Copies of standards can be obtained by contacting Standards Australia on 1300 654 646 or by visiting standards.com.au

Note: This Alert has been prepared using the best information available to WorkSafe Victoria. Any information about legislative obligations or responsibilities included in this material is only applicable to the circumstances described in the material. You should always check the legislation referred to in this material and make your own judgement about what action you may need to take to ensure you have complied with the law. Accordingly, WorkSafe Victoria extends no warranties as to the suitability of the information for your specific circumstances.

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