



COMPRESSED GAS ASSOCIATION, INC.

SAFETY BULLETIN

SB-22—2013

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ALUMINUM CYLINDERS—GUIDELINES FOR HEAT EXPOSURE INDICATING SYSTEMS

This bulletin applies to high pressure, refillable aluminum cylinders made from aluminum alloy 6351 or 6061.

Aluminum cylinders can be damaged by exposure to temperatures higher than 350 °F (177 °C). Exposure to temperatures higher than these, could weaken the cylinder to such an extent that the cylinder could be unsafe to fill. Visual examination of the cylinder could not be sufficient to determine if the cylinder has been heat affected. In most cases, overheating from a fire is readily apparent by standard visual examination. However, other sources of heat (electric element, super heated steam, hot air) could possibly not produce any visual sign or indicator of overheating. Therefore, a system for indicating if aluminum cylinders have been exposed to elevated temperatures is recommended.

When a heat indicating system is used, that system shall have the following:

- Indicator system—The system shall indicate both localized and general overexposure to heat on the cylinder;
- System activation—The system shall indicate heat overexposure to the cylinder before the cylinder becomes unsafe to fill;
- Visual indication—The indicator shall clearly show that the cylinder was exposed to heat that could make the cylinder unsafe to fill. The indicator shall show an obvious change that cannot be mistaken for normal wear and tear. The change shall be apparent to all trained operators;
- Irreversible—A change in the indicator shall be permanent and cannot change back to the original form/color after the removal of the heat source or with the passage of time;
- Resistance to the environment—The indicator shall not easily deteriorate with exposure to the environment;
- Reliability—The system shall provide a consistent indication of exposure to high temperatures that could render the cylinder unsafe to fill. Some number of false positives are acceptable, but the number of undetected positives (false negatives) shall be zero;
- Tamper resistance—The indicator shall stay attached to the cylinder and shall not easily be removed or defaced; and
- Maintenance and inspection—Inspection of the system shall be performed before each filling and requalification of the cylinder. Personnel who fill aluminum cylinders shall be trained in recognizing the existence and the activation of the indicating system. The supplier, applier, or a designated representative of the system shall periodically verify that the system is operational. The supplier shall provide certification, when requested, that their heat indicating product meets the criteria in this safety bulletin.

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