



COMPRESSED GAS ASSOCIATION, INC.

SAFETY BULLETIN

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POTENTIAL VALVE THREAD AND CYLINDER THREAD MISMATCH

This safety bulletin serves as notice that threads on the cylinder valve that do not match the threads in the cylinder have been known to create a temporary pressure seal only to fail at a later time resulting in ejection of the valve. For example, a cylinder and valve mismatch can be made between a straight thread (3/4"-16 UNF-2A) O-ring seal valve and a tapered thread (1/2"-14 NGT) style cylinder. As a result, CGA TB-16, *Recommended Coding System for Threaded Cylinder Outlets and Threaded Valve Inlets*, was produced, which provides for thread identification markings on the valve and cylinder to avoid such mismatches [1]. Although there are other potential thread mismatches, this safety bulletin focuses on medical gas cylinders and valves.

Straight thread (3/4"-16 UNF-2A) O-ring seal, pin-index valves are primarily used on D and E style aluminum and "lightweight" carbon steel cylinders equipped to accept an O-ring seal having the corresponding (3/4"-16 UNF-2B) straight thread opening. In addition to pin-index type valves, there also can be other types of valves that are supplied with a straight inlet thread (3/4"-16 UNF-2A), presenting the same potential for mismatch.

Visually, the difference between the straight thread, O-ring seal valve, and tapered thread valve is very obvious if the loose ring flange and O-ring(s) are installed on the straight thread valve.

If the loose ring flange and O-ring(s) are missing on the straight thread valve, the visual difference between straight and tapered threads is not obvious and some other means of identification is required (see Figure 1). For the mismatch example given previously, the coding system described in CGA TB-16 requires a "U12" marking on the valve with 3/4"-16 UNF-2B straight threads and a "08N" marking on the cylinder with 1/2"-14 NGT tapered threads [1]. Since the valve code does not match the cylinder thread code, it indicates a mismatch. CGA TB-16 recommends that all new cylinder valves and cylinders made after December 31, 1998, comply with a thread-code marking system.

The straight thread valve has a cylindrical-shape inlet thread area and can have either one or two O-rings at the inlet threads just below the valve body (see Figure 1). A straight thread, pin-index valve with no O-ring groove has also been supplied for aluminum alloy cylinders.

CAUTION: "Lightweight" carbon steel and aluminum alloy cylinder styles D and E both use 3/4"-16 UNF threads. Straight thread valves designed for carbon steel cylinders can have a different inlet O-ring configuration than valves designed for aluminum alloy cylinders. Due to this difference, they are not to be interchanged.

In comparison, the tapered thread (1/2"-14 NGT) valve has a conical shape or taper and no O-ring groove(s) on the inlet thread area. At the uppermost thread, there can be a relief or undercut, which is not an O-ring groove.

"Lightweight" carbon steel D and E cylinders can be distinguished from conventional carbon steel D and E cylinders by their weight, which is approximately 2 lb (0.9 kg) less. Visually, the difference between the cylinders is not obvious since their geometries are similar. "Lightweight" carbon steel cylinders do have a slight bevel at the top of the neck thread to accommodate the O-ring and a sharper contour between the shoulder and the neck. These can be difficult to spot without a side-by-side comparison.

Personnel who valve cylinders (especially D or E styles) should be made aware of this potential mismatch so they can inspect cylinders and valves for mismatches before valving the cylinder. Thread gauges can be used to identify cylinder and valve threads. Valve manufacturers have designed go/no-go gauges that can be produced to aid in the valve thread examination/identification process. Consult with your valve supplier for

further information. In addition, see CGA V-11, *General Guidelines for the Installation of Valves into High Pressure Aluminum Alloy Cylinders*, for further information [2].

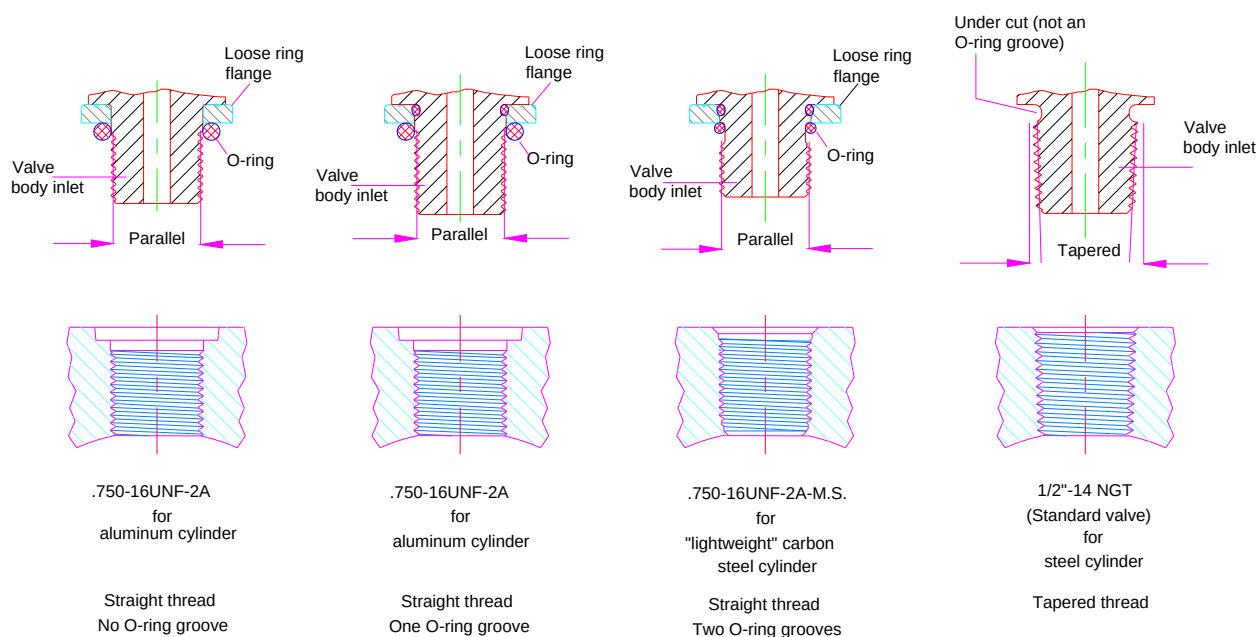


Figure 1—Illustration of valve threads

Reference

Unless otherwise specified, the last edition shall apply.

[1] CGA TB-16, *Recommended Coding System for Threaded Cylinder Outlets and Threaded Valve Inlets*, Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151. www.cganet.com

[2] CGA V-11, *General Guidelines for the Installation of Valves into High Pressure Aluminum Alloy Cylinders*, Compressed Gas Association, 14501 George Carter Way, Suite 103, Chantilly, VA 20151. www.cganet.com