

July 25, 2014

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UL 1477

Outline of Investigation for Compressed Gas Shutoff Valves

Issue Number: 4

July 25, 2014

Summary of Topics

This fourth issue of the Outline of Investigation for Compressed Gas Shutoff Valves, UL 1477, is being issued to delete the reference to the carbon arc test in paragraph 21.2 as this test is obsolete.

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INTRODUCTION

1 Scope

1.1 These requirements cover manually operated shutoff and metering valves used in compressed and fuel gas piping systems, including manifolds, and with equipment and appliances as defined herein, other than those for anhydrous ammonia and are usually designated as gas-line service valves.

1.2 Shutoff valves covered by these requirements are for use in systems and facilities where complete shutoff is required. Metering type valves are used in piping and equipment systems where complete shutoff is not required.

1.3 Shut-off valves of the type commonly referred to as "cylinder valves" used on containers constructed under Department of Transportation (DOT) or Transport Canada (TC) Specifications are covered by the requirements in the Standard for Cylinder Valves, UL 1769.

1.4 Gas-line shut-off valves for use with liquefied petroleum gases, within the scope of NFPA 58, LP-Gas Code, or anhydrous ammonia within the scope of Safety Requirements for the Storage and Handling of Anhydrous Ammonia, ANSI/CGA G-2.1 (ANSI 61.1K) are covered by the requirements in the Standard for Flow Control Valves for Anhydrous Ammonia and LP-Gas, UL 125.

1.5 Automatic shutoff valves that would use pressure, temperature (heat) or electricity or combination of such for operation and self-closing types are covered by the requirements in the Standard for Valves for Flammable Fluids, UL 842 or the Standard for Electrically Operated Valves, UL 429.

1.6 These requirements do not apply to valves for compressed gases for use in refrigerated storage systems.

1.7 Except for such observations as are required to ascertain performance characteristics, the assigning of flow capacity ratings are not within the scope of these requirements.

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, a component of a product covered by this outline shall comply with the requirements for that component.

2.1.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature of characteristic not required in the application of the component in the product covered by this outline, or
- b) Is superseded by a requirement in this outline.

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

3 Glossary

3.1 For the purpose of this outline, the following definitions apply.

3.2 COMPRESSED GAS IN SOLUTION (ACETYLENE) – A nonliquefied compressed gas that is dissolved in a solvent.

3.3 FUEL GAS – Acetylene, hydrogen, natural gas, liquefied petroleum gas (LP-Gas), methylacetylene-propadiene stabilized gas (MPS-Gas), methane, and other liquefied and non-liquefied flammable gases, not including biofuels, that are stable because of their composition or because of the conditions of storage.

3.4 LIQUEFIED COMPRESSED GAS – A gas that under the charged pressure is partially liquid at a temperature of 70.0°F (21.1°C).

3.5 LIQUEFIED PETROLEUM GAS (LP-GAS OR LPG) – Any material having a vapor pressure not exceeding that allowed for commercial propane composed predominantly of the following hydrocarbons, either by themselves (except propylene) or as mixtures: propane, propylene, butane (normal butane or isobutane) and butylenes.

3.6 METERING VALVE – A valve that does not close off the flow of gas completely at the seating area but regulates the flow of gas.

3.7 NONLIQUEFIED COMPRESSED GAS – A gas, other than a gas in solution, which under the charged pressure is entirely gaseous at a temperature of 70.0°F (21.1°C).

4 Pressure and Temperature Rating

4.1 The pressure rating of a valve shall not be less than the pressure rating of the piping system or equipment to which it is installed.

4.2 Valves covered by these requirements shall have a minimum ambient temperature rating range of minus 40 – plus 125°F (minus 40 – plus 52°C).

4.3 If a valve is to be marked with the term "Fuel Gas" and not the specific fuel gas(es), the valve shall be suitable for all gases specified in 3.3. The maximum pressure for these gases, other than acetylene, shall be the same.

CONSTRUCTION

5 General

5.1 A valve shall include all of the components required for its normal function and installation, and shall be furnished as a single unit or assembly.

5.2 When a valve is of a design that requires the use of special pipe flanges, gaskets, bolts, or other special fittings or parts for making a proper installation, such parts shall be furnished by the manufacturer with each valve.

5.3 The construction of a valve shall be such that parts can be reassembled after being dismantled to the extent provided for routine maintenance.

5.4 Means shall be provided for the purpose of making any required field adjustment.

5.5 A valve with socket or butt weld ends shall be constructed so that it is capable of being installed without damaging nonmetallic seats or seals. Instructions for accomplishing this shall accompany each valve.

5.6 A seat disc shall be attached to its poppet or holder, or otherwise assembled so as to prevent it from becoming dislocated under service conditions. The means to secure the disc shall not rely on cement or adhesive.

5.7 A shutoff valve shall not be equipped with a bypass or other means to prevent it from closing completely. Metering type valves are permitted to have a bypass or incorporate a seating mechanism that does not close completely.

5.8 The appropriate operating positions or the direction of movement shall be clearly indicated for a operating lever or handle.