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UL 119

OUTLINE OF INVESTIGATION
FOR
ADAPTERS, FITTINGS AND COUPLINGS FOR ANHYDROUS AMMONIA AND
FUEL GASES

Issue Number: 3

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Summary of Topics

This is the third issue of the Outline of Investigation for Adapters, Fittings and Couplings for Anhydrous Ammonia and Fuel Gases, UL 119, includes a revision to clarify the marking requirement for thermal shutoff devices.

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INTRODUCTION

1 Scope

1.1 These requirements cover adapters, couplings and fittings intended for use with natural gas, manufactured gas, liquefied petroleum gas (LP-Gas), and mixtures thereof, or anhydrous ammonia for making connections in domestic, commercial, or industrial types of systems. Devices that have been identified are as follows:

- a) Adapters and fittings, which include those that convert one connection to another;
- b) Excess flow and check valve adapters and fittings;
- c) Filling adapters;
- d) Gauge adapter and fittings;
- e) Quick-Connect Couplings (other than for low pressure couplings in accordance with the Standard for Quick Disconnect Devices for Use with Gas Fuel Appliances, CSA/ANSI Z21.41;
- f) Sight flow indicators;
- g) Breakaway couplings;
- h) Thermal shutoff adapters and fittings; and
- i) Unloading adapters.

1.2 Devices covered by these requirements are intended for use in systems and facilities covered in one of the following:

- a) National Fuel Gas Code, NFPA 54;
- b) Liquefied Petroleum Gas Code, NFPA 58;
- c) American National Standard Safety Requirements for the Storage and Handling of Anhydrous Ammonia, ANSI/CGA G-2.1 (ANSI K61.1); or
- d) Standard on Recreational Vehicles, NFPA 1192.

1.3 Adapters, couplings and fittings for LP-Gas engine fuel service are covered by the Outline of Investigation for LP-Gas and Natural Gas Devices for Engine Fuel Systems, Subject 1337.

1.4 These requirements do not apply to adapters, couplings or fittings for anhydrous ammonia for use on containers or in systems for the following:

- a) Refrigerated storage systems,
- b) Ammonia manufacturing plants,
- c) Refrigeration plants where ammonia is used solely as a refrigerant, and
- d) Ammonia transportation pipelines.

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 or 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.

2.1.5 Adapters for actuated liquid withdrawal excess flow valves shall comply with the applicable requirements of the Standard for Valves for Anhydrous Ammonia and LP-Gas (Other Than Safety Relief), UL 125.

2.1.6 Adapters fittings and couplings used in LP-Gas or anhydrous ammonia filling applications that incorporate a fixed liquid level gauge shall comply with the Seat Leakage Test, Section 19, and the Shutoff and Vent Valve Endurance Test, Section 23.

2.1.7 Adapters fittings and couplings used with filler valves for LP-Gas or anhydrous ammonia service, which incorporate a check valve, shall comply with the applicable requirements of the Standard for Valves for Anhydrous Ammonia and LP-Gas (Other Than Safety Relief), UL 125.

2.1.8 Gauging devices, including fixed tube and vent valve indicators, used in the assembly of adapters, fittings, or couplings shall comply with the applicable requirements of the Standard for Liquid-Level Gauges and Indicators for Anhydrous Ammonia and LP-Gas, UL 565.

2.1.9 A pigtail or flexible hose connection that is part of an adapter, or coupling for LP-Gas shall comply with the applicable requirements of the Standard for Pigtails and Flexible Hose Connectors for LP-Gas, UL 569.

2.2 Undated references

2.2.1 Any undated reference to a code or standard appearing in the requirements of this outline shall be interpreted as referring to the latest edition of that code or standard.

2.3 Units of measurement

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

2.4 Pressure rating

2.4.1 Adapters, couplings and fittings that are intended for use with liquefied petroleum gas (LP-Gas), or anhydrous ammonia and are intended to be connected directly to containers or container appurtenances shall be rated for use at a pressure not less than 250 psig. Devices intended to be used downstream of a LP-Gas pump, or dispensing unit shall be rated for use at a pressure not less than 350 psig.

2.4.2 Adapters, couplings and fittings that are intended for use with natural gas, liquefied petroleum (LP) gases in the gaseous phase and LP-Gas-air mixtures shall be rated for 1/2, 2, 5 psig or higher than 5 psig in 5 psi increments up to and including a maximum operating pressure of 125 psig.

2.4.3 Devices other than noted in 2.4.1 and 2.4.2 shall be rated not less than the pressure rating of the piping system to which they are intended to be installed.

2.5 Temperature rating

2.5.1 Adapters, couplings and fittings that are intended for use with LP-Gas or anhydrous ammonia at a pressure greater than 20 psig shall be rated for outdoor use. All other devices may be rated for indoor or outdoor use.

2.5.2 Outdoor use shall include an ambient temperature range not less than the range of minus 40°F (minus 40°C) – 130°F (55°C).

2.5.3 Indoor use shall include an ambient temperature range not less than the range of 32°F (0°C) – 125°F (52°C).

3 Glossary

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

3.2 ADAPTER – A fitting that is used to convert one type or size of connection to another.

3.3 BODY – The principal structure of the device that contains and supports internal mechanisms and constitutes the main gas passage.

3.4 BREAKAWAY COUPLING – A coupling that incorporates a weak section that is designed to fracture when a sufficient force is applied.

3.5 BYPASS – A passageway, orifice, or path that permits fluid flow entirely independent of the action of a mechanism or valve.

3.6 CHECK VALVE, BACKPRESSURE – A device that permits fluid flow in only one direction.

3.7 CONNECTION – That part of the device that mates with the piping system component, e.g. valve, regulator, hose assembly, another fitting or adapter, or piping component.

3.8 EXCESS FLOW MECHANISM (VALVE) – A device that is in an open position and closes when a specified amount of flow (liquid or vapor) is obtained.

3.9 GAUGING DEVICE – A device that measures either pressure or liquid level in a container or piping system. Pressure type gauging devices may be considered leak detectors by indicating pressure loss in a piping system between two shutoff valves.

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

3.11 QUICK CONNECT DEVICE – A device that consists of two parts, which provides a means for manually connecting and disconnecting components of a piping or hose system or appliance, without the use of tools.

3.12 SIGHT FLOW INDICATOR – A device that incorporates a means to visually inspect liquid flow conditions.

3.13 THERMAL SHUTOFF VALVE – A device that is in an open position and closes when the device is exposed to a specified temperature.

3.14 TOOL, SPECIAL – Tools that are not available on the open retail market.

3.15 UNLOADING ADAPTER – A device that incorporates a shutoff valve, which allows removal of liquefied gas from a container that employs a filler valve.