



GUIDE
FOR
THE INVESTIGATION
OF
PRESSURE-REGULATING VALVES

UNDERWRITERS' LABORATORIES OF CANADA

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OF
PRESSURE-REGULATING VALVES

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UNDERWRITERS' LABORATORIES OF CANADA

General Offices and Testing Station

7 CROUSE ROAD, SCARBOROUGH, ONTARIO

Telephone 757-3611 Area Code 416

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GUIDE FOR THE INVESTIGATION OF PRESSURE-REGULATING VALVES

GENERAL

1. Scope

1.1 These requirements cover pressure regulators for use with LP-Gas equipment other than automotive. They are not intended to cover regulators for utility gas plants or petroleum refineries, chemical process uses, or regulators for use in gas-welding and cutting operations.

1.2 Regulators covered by these requirements are intended for use in nonrefrigerated systems in accordance with the Installation Code for Propane Burning Appliances and Equipment, CGA B149.2.

1.3 Regulators for use in gas-welding and cutting operations or systems are not covered by these requirements.

1.4 Devices covered by these requirements are of two types, commonly known as Low-Pressure Regulators and High-Pressure Regulators.

1.5 LOW-PRESSURE REGULATORS are those designed for handling LP-Gas in the gaseous phase only, and for reducing the prevailing cylinder, tank, or other pressure in excess of 1 pound per square inch (psi) to a pressure of 1 psi or less. These regulators are commonly used for single-stage pressure-reduction service, or as second-stage regulators in two-stage pressure-reduction systems. Regulators for second-stage service only are intended for use at inlet pressures not in excess of 20 psi.

1.6 HIGH-PRESSURE REGULATORS are those designed for reducing the prevailing cylinder, tank, or other pressure in excess of 1 psi to a lower pressure also in excess of 1 psi. These regulators may be designed for handling LP-Gas in either the gaseous or liquid phase. Regulators of these designs are commonly used as single-stage regulators where delivery pressures greater than 1 psi are desired, or as first- or second-stage regulators in two-stage pressure-reduction systems.

1.7 The term "regulator" as used in this Guide refers to pressure-regulating valves unless specifically noted otherwise.

1.8 The assigning of flow ratings to regulators is not within the scope of these requirements, even though observations of flow values may be necessary to ascertain stability characteristics. Data regarding flow ratings are to be obtained from the regulator manufacturer.

1.9 AIR FLOW as used in these requirements is considered to be at a base pressure of 14.7 psi absolute, and at a base temperature of 60°F.

1.10 LOCKUP PRESSURE as used in these requirements is the outlet pressure of the regulator under no-flow conditions.

2. General

2.1 A component of a regulator shall comply with the requirements for that component, except that such requirements may be modified if appropriate for the particular application.

CONSTRUCTION

3. Assembly

3.1 A regulator shall include all the components necessary for its normal function when used as intended. The components shall be planned for assembly as a unit.

3.2 A regulator shall be constructed so that parts can be readily reassembled in a proper manner after being dismantled to the extent needed for normal care.

3.3 Convenient means shall be provided for the purpose of making any necessary field adjustment.

3.4 A screw, bolt, or lever-pin hole shall not extend through the outer wall of the regulator body into a gas-handling chamber unless closed by a threaded plug or suitably closed otherwise to prevent leakage of gas.

3.5 A valve seat or disc shall be attached to its holder by a method that ensures against the disc loosening and working out of position under service conditions.

3.6 Provision shall be made in the design of a holder and disc assembly to preclude the trapping of air or gas back of the disc, which might expand and force the disc out of its position in the holder.

4. Materials

4.1 All parts of a regulator in contact with liquefied petroleum gas shall be of such quality as to make them resistant to the action of the fluid under the service conditions to which they are subjected.

4.2 To conform to Clause 4.1, a part made of a nonmetallic material is not to crack, harden, shrink, lose weight, or otherwise deteriorate sufficiently to permit external leakage or cause the regulator to malfunction when:

A A part made of a compound affected by aging is placed in an oxygen bomb for 96 hours at 158°F and at a pressure of 300 psi; and

B A part is immersed for 70 hours in normal hexane.

4.3 If corrosion of a ferrous part will interfere with the proper function of the regulator, or otherwise be conducive to the introduction of a detrimental condition, such part shall be provided with a protective coating.

4.4 A protective coating shall provide resistance against corrosion to a degree not less than that provided by the protective coatings specified in Clause 4.5.

4.5 Cadmium plating shall have a thickness of not less than 0.0003 inch, and zinc plating shall have a thickness of not less than 0.0005 inch, except on parts where threads constitute the major portion of the area, in which case the thickness of the cadmium or zinc plating shall be not less than 0.00015 inch.

4.6 A part made of drawn-brass or machined-brass rod or bar-stock part shall be capable of withstanding, without cracking, the mercurous-nitrate test for copper and copper alloys. See Mercurous-Nitrate Immersion Test.