

**CGA E-4—2010**

**STANDARD FOR GAS  
PRESSURE REGULATORS**

**SIXTH EDITION**



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NOTE—Technical changes from the previous edition are underlined.

NOTE—Appendix A (Normative) is a requirement.

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## 1 Scope

This standard specifies requirements for regulators used with compressed gases to reduce the supply pressure from a storage cylinder, pipeline, or other source to the use pressure.

This standard contains design and manufacturing requirements relating to materials, construction, performance, test procedures, information, marking, and packaging of pressure regulators. Appendix A provides information relating to regulator flow capacity calculations. For pressure regulators used with medical gases, additional requirements are specified in CGA E-7, *Medical Gas Pressure Regulators, Flowmeters, and Orifice Flow Selectors* [1].<sup>1</sup>

This standard does not apply to liquefied petroleum gas (LPG) pressure regulators for equipment intended for installation and use in accordance with the requirements of NFPA 58, *Liquefied Petroleum Gas Code* [2].

## 2 Definitions

For the purpose of this standard, the following definitions apply.

### 2.1 Bar

Unit of pressure measurement used in standards produced by the International Organization for Standardization (ISO).

NOTE—1 bar = 100 kPa = 14.5 psi.<sup>2</sup>

### 2.2 Creep

Continuing rise above set pressure, after downstream flow is shutoff, due to an internal leak.

NOTE—Creep is sometimes referred to as crawl.

### 2.3 Flow regulation

Change in set pressure, measured downstream from the regulator outlet passage, caused by a change in flow rate (see 6.3).

### 2.4 Leak rate

Rate at which the gas escapes from the volume of containment.

NOTE—Factors affecting the leak rate are pressure differential, properties of the gas, cross-sectional area, and length of the leak passage.

### 2.5 Pressure

Force per unit area exerted by the gas on the walls of the gas container.

NOTE—In the customary U.S. system of measurement, pressure is expressed in pounds per square inch. In ISO standards, pressure is expressed in units based on the Le System International d'Unites (SI system).

#### 2.5.1 Pounds per square inch absolute (psia)

Unit of pressure measurement with zero pressure as the base or reference pressure.

#### 2.5.2 Pounds per square inch gauge (psig)

Unit of pressure measurement with atmospheric pressure as the base or reference pressure.

NOTE—Under standard conditions, 0 psig is equivalent to 14.7 psia (101 kPa, abs).

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<sup>1</sup> References are shown by bracketed numbers and are listed in order of appearance in the reference section.

<sup>2</sup> kPa shall indicate gauge pressure unless otherwise noted as (kPa, abs) for absolute pressure or (kPa, differential) for differential pressure. All kPa values are rounded off per CGA P-11, *Metric Practice Guide for the Compressed Gas Industry* [3].