



Standard Test Method for Performance Testing of Excess Flow Valves¹

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1. Scope

1.1 This test method covers a standardized method to determine the performance of excess flow valves (EFVs) designed to limit flow or stop flow in thermoplastic natural gas service lines.²

1.2 All tests are intended to be performed using air as the test fluid. Unless otherwise stated, all flow rates are reported in standard cubic feet per hour of 0.6 relative density natural gas.

1.3 The test method recognizes two types of EFV. One type, an excess flow valve-bypass (EFVB), allows a small amount of gas to bleed through (bypass) after it has tripped, usually as a means of automatically resetting the device. The second type, an excess flow valve-non bypass (EFVNB), is intended to trip shut forming an essentially gas tight seal.

1.4 The performance characteristics covered in this test method include flow at trip point, pressure drop across the EFV, bypass flow rate of the EFVB or leak rate through the EFVNB after trip, and verification that the EFV can be reset.

1.4.1 Gas distribution systems may contain condensates and particulates such as organic matter, sand, dirt, and iron compounds. Field experience has shown that the operating characteristics of some EFVs may be affected by accumulations of these materials. The tests of Section 11 were developed to provide a simple, inexpensive, reproducible test that quantifies the effect, if any, of a uniform coating of kerosene and of kerosene contaminated with a specified amount of ferric oxide powder on an EFV's operating characteristics.

1.5 Excess flow valves covered by this test method will normally have the following characteristics: a pressure rating of up to 125 psig (0.86 MPa); a trip flow of between 200 and

2500 ft³/h (5.66 and 70.8 m³/h) at 10 psig (0.07 MPa); a minimum temperature rating of 0°F (–18°C), and a maximum temperature rating of 100°F (38°C).

1.6 The EFVs covered by this test method shall be constructed to fit piping systems no smaller than ½ CTS and no larger than 1¼ IPS, including both pipe and tubing sizes.

1.7 Tests will be performed at 67 ± 10°F (19.4 ± 5.5°C). Alternative optional test temperatures are 100 ± 10°F (37.7 ± 5.5°C) and 0 ± 10°F (–18 ± 5.5°C). All flow rates must be corrected to standard conditions.

1.8 This test method was written for EFVs installed in thermoplastic piping systems. However, it is expected that the test method may also be used for similar devices in other piping systems.

1.9 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.10 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. For specific precautions, see Section 8.*

2. Referenced Documents

2.1 ASTM Standards:³

D1600 Terminology for Abbreviated Terms Relating to Plastics

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

F412 Terminology Relating to Plastic Piping Systems

2.2 ANSI Standard:

B31.8 Gas Transmission and Distribution Piping Systems⁴

¹ This test method is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.40 on Test Methods.

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² This contamination test procedure may be utilized to determine the effect, if any, of contaminants from a specific gas distribution system on the operational characteristics of an EFV under consideration for use in that system. Condensates, oils and particulates removed from that distribution system could be substituted for kerosene and iron oxide. Results obtained from using reagents or contaminants other than those specified in this test method must not be used in comparison with results obtained using the reagents specified in this test method.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.