

Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats

API STANDARD 607
SIXTH EDITION, SEPTEMBER 2010



AMERICAN PETROLEUM INSTITUTE

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Downstream Segment

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Introduction

This International Standard covers the requirements and method for evaluating the performance of valves when they are exposed to defined fire conditions. The performance requirements establish limits of acceptability of a valve, regardless of size or pressure rating. The burn period has been established to represent the maximum time required to extinguish most fires. Fires of longer duration are considered to be of major magnitude with consequences greater than those anticipated in the test. The test pressure during the burn is set at 0.2 MPa.(29 psig) for soft-seated valves rated PN 16, PN 25, and PN 40, Class 150 and Class 300, to better simulate the conditions that would be expected in a process plant when a fire is detected and pumps are shut down. In this case, the source of pressure in the system is the hydrostatic head resulting from liquid levels in towers and vessels. This situation is approximated by this lower test pressure.

In production facilities, valves are typically of a higher rating and the pressure source is not easily reduced when a fire is detected. Therefore, for all other valves, the test pressure during the burn is set at a higher value to better simulate the expected service conditions in these facilities. Use of this International Standard assumes that the execution of its provisions is entrusted to appropriately qualified and experienced personnel because it calls for procedures that may be injurious to health if adequate precautions are not taken. This International Standard refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage of the procedure.

Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats

1 Scope

This International Standard specifies fire type-testing requirements and a fire type-test method for confirming the pressure-containing capability of a valve under pressure during and after the fire test. It does not cover the testing requirements for valve actuators other than manually operated gear boxes or similar mechanisms when these form part of the normal valve assembly. Other types of valve actuators (e.g. electrical, pneumatic, or hydraulic) may need special protection to operate in the environment considered in this valve test, and the fire testing of such actuators is outside the scope of this International Standard.

NOTE For the purposes of this International Standard, the terms “fire type-test” and “fire test” are synonymous.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Specification 6D/ISO 14313, *Pipeline Valves*

API Recommended Practice 591, *User Acceptance of Refinery Valves*

API Standard 598, *Valve Inspection and Testing*

API Standard 599, *Metal Plug Valves—Flanged, Threaded, and Welding Ends*

API Standard 608, *Metal Ball Valves—Flanged, Threaded, and Welding Ends*

API Standard 609, *Butterfly Valves: Double Flanged, Lug- and Wafer-Type*

ASME B1.20.1¹, *Pipe Threads General Purpose*

ASME B16.34, *Valves—Flanged, Threaded, and Welding End*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1

nominal size

DN

Alphanumeric designation of size for components of a pipework system, which is used for reference purposes, comprising the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimeters, of the bore or outside diameter of the end connections [ISO 6708:1995, definition 2.1].

¹ ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.org.