

Standard for Fire Test of Valves

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The verbal forms used to express the provisions in this specification are as follows:

- the term “shall” denotes a minimum requirement to conform to the standard;
- the term “should” denotes a recommendation or that which is advised but not required to conform to the standard;
- the term “may” is used to express permission or a provision that is optional;
- the term “can” is used to express possibility or capability.

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Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001, standards@api.org.

Precautions

WARNING — Fire testing of valves involves potential hazards. Depending on the design of the test valve and/or the nature of the fire test itself, the potential exists for a rupture of the pressure boundary components during testing. Protection for test personnel must be provided. Additionally, hazardous byproducts may be generated during the fire test as a result of decomposition of organic materials. Training of personnel on proper handling of any hazardous byproducts may be required.

WARNING — The system relief pressure must be low enough to preclude the rupture of the valve at the expected test temperatures.

WARNING — Elements, such as lead, tin, antimony, bismuth and cadmium that cause liquid metal embrittlement shall not be used in areas that are subjected to elevated temperatures.

CAUTION — A rupture of the pressure boundary components during the performance of a fire test may occur. The performance of a fire test may require additional safety precautions to be taken to minimize the likelihood of damage to surrounding equipment or the test environment.

Important Information Concerning Use of Asbestos or Alternative Materials

Asbestos is specified or referenced for certain components of the equipment described in some API standards. It has been of extreme usefulness in minimizing fire hazards associated with petroleum processing. It has also been a universal sealing material, compatible with most refining fluid services.

Certain serious adverse health effects are associated with asbestos, among them the serious and often fatal diseases of lung cancer, asbestosis, and mesothelioma (a cancer of the chest and abdominal linings). The degree of exposure to asbestos varies with the product and the work practices involved.

Consult the most recent edition of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, Occupational Safety and Health Standard for Asbestos, Tremolite, Anthophyllite, and Actinolite, 29 Code of Federal Regulations Section 1910.1001 ; the U.S. Environmental Protection Agency, National Emission Standard for Asbestos, 40 Code of Federal Regulations Sections 61.140 through 61.156 ; and the U.S. Environmental Protection Agency (EPA) rule on labeling requirements and phased banning of asbestos products (Sections 763.160 –179).

There are currently in use and under development several substitute materials to replace asbestos in certain applications. Manufacturers and users are encouraged to develop and use effective substitute materials that can meet the specifications for, and operating requirements of, the equipment to which they would apply.

SAFETY AND HEALTH INFORMATION WITH RESPECT TO PARTICULAR PRODUCTS OR MATERIALS CAN BE OBTAINED FROM THE EMPLOYER, THE MANUFACTURER OR SUPPLIER OF THAT PRODUCT OR MATERIAL, OR THE MATERIAL SAFETY DATA SHEET.

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Introduction

This standard is not intended to inhibit a manufacturer from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This may be particularly applicable where there is innovative or developing technology. When an alternative is offered, the manufacturer should identify any variation from this standard and provide details.

Informative Annexes are for informational purposes only and are not mandatory requirements.

Normative Annexes are indispensable and mandatory for the application of this document.

Changes from the 4th to the 5th Edition

This standard is the result of updating the requirements from API Standard 6FA, Fourth Edition, to include requirements from API 6FD, Fire Test for Check Valves, in its entirety. With the publication of this document, the API 6FD document was withdrawn.

Units of Measurement

In this standard, data are expressed in both U.S. customary (USC) and metric (SI) units.

Standard for Fire Test of Valves

1 Scope

This standard establishes the requirements for testing and evaluating the pressure-containing performance of API 6A and API 6D valves when exposed to fire. The performance requirements of this standard establish qualification criteria for all sizes and pressure ratings. This standard may be applied to valves that do not meet the requirements of API 6A or API 6D at the user's discretion.

This standard applies to valves with one or more closure members.

This standard establishes acceptable levels for leakage through the test valve and external leakage after exposure to a fire for a 30-minute time period. The fire exposure test period has been established on the basis that it represents the maximum time required to extinguish most fires. Fires of greater duration are considered to be of a major magnitude, with consequences greater than those anticipated in this test.

This standard is not intended to address the qualification of valve actuators (including manually operated gearboxes). This standard does not cover pressure boundary penetration, external fittings, or end connections.

2 Normative References

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies, except that new editions may be used on issue and shall become mandatory upon the effective date specified by the publisher or six months from the date of the revision (where no effective date is specified).

API Specification 6A, *Specification for Wellhead and Tree Equipment*

API Specification 6D, *Specification for Pipeline Valves and Piping Valves*

ASTM D1414, *Standard Test Methods for Rubber O-Rings*

ASTM D1418, *Standard Practice for Rubber and Rubber Latices—Nomenclature*

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension*

ASTM D4000, *Standard Classification System for Specifying Plastic Materials*

ASTM D4065, *Standard Practice for Plastics: Dynamic Mechanical Properties: Determination and Report of Procedures*

3 Terms, Definitions, Acronyms, Abbreviations, Symbols, and Units

3.1 Terms and Definitions

For the purposes of this standard, the definitions in API 6A and API 6D shall apply. When identical terms are defined in API 6A and API 6D and this standard, the following definitions shall apply.

3.1.1

class

pressure class

Numerical pressure design class expressed in accordance with either the nominal pressure (PN) class or the ASME rating class.