Fire Test for Evaluation of Valve Stem Packing and Piping Flange Gaskets

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Introduction

This standard covers the requirements for testing and evaluating the performance of valve stem packing and piping flange gaskets in a test fixture when they are exposed to specifically defined fire conditions. The requirements described in this standard establish performance limits for evaluating valve stem packing or gasket acceptability.

This standard does not address exposure to long-term high temperature conditions or aging characteristics of packing components.

This standard calls for procedures that may be injurious to health if adequate precautions are not taken; therefore, the use of this standard assumes that execution of its provisions is entrusted to appropriately qualified and experienced personnel only. This 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 Evaluation of Valve Stem Packing and Piping Flange Gaskets

1 Scope

This standard covers the requirements for testing and evaluating the performance of valve stem packing and piping flange gaskets when they are exposed to a fire as defined in this standard. Valve stem packing and piping flange gaskets can be a combination or an arrangement of more than one material and construction. The test procedure in this standard simulates circumstances that impose severe demands on valve stem packing or flange gaskets.

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 Standard 600*, Steel Gate Valves—Flanged and Butt-welding Ends, Bolted Bonnets*

API Standard 602, *Gate, Globe, and Check Valves for Sizes DN 100 (NPS 4) and Smaller for the Petroleum and Natural Gas Industries*

API Standard 622, *Type Testing of Process Valve Packing for Fugitive Emissions*

ASME B16.5[1], *Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard*

ASTM A105/A105M[2], *Standard Specification for Carbon Steel Forgings for Piping Applications*

ASTM A193/A193M, *Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications*

ASTM A194, *Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both*

ASTM A216/A216M, *Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service*

IEC 60584-1[3], *Thermocouples – Part 1: EMF specifications and tolerances*

3 Terms and Definitions

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

3.1
class
An alphanumeric designation that is used for reference purposes related to test assembly/flange pressure-temperature capability, considering test assembly material mechanical properties and test assembly dimensional characteristics. It comprises the word “class” followed by a dimensionless whole number. The

[1] American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990, www.asme.org.
[2] ASTM International, 100 Bar Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428, www.astm.org.
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