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Ships and marine technology — Globe valves for use in low temperature applications — Design and testing requirements

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 3, *Piping and machinery*.

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Ships and marine technology — Globe valves for use in low temperature applications — Design and testing requirements

1 Scope

This document specifies design, manufacture and test method requirements for cryogenic globe valves for excellent quality leakage stability for use in a very low temperature environment (–50°C to –196°C).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 5209, *General purpose industrial valves — Marking*

ISO 28921-1, *Industrial valves — Isolating valves for low-temperature applications — Part 1: Design, manufacturing and production testing*

ASME B1.5, *Acme Screw Threads*

ASME B1.8, *Stub Acme Screw Flanged Fittings*

ASME B16.5, *Pipe Flanges and Flanged Fittings*

ASME B16.10, *Face-to-Face and End-to-End Dimensions of Valves*

ASME B16.11, *Forged Fittings, Socket-Welding and Threaded*

ASME B16.25, *Butt-welding Ends*

ASME B16.34, *Valves-Flanged, Threads, and Welding End*

ASME B16.47, *Large Diameter Steel Flanges*

ASME B46.1, *Surface Texture (Surface Roughness, Waviness, and Lay)*

ASTM A182/A182M, *Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-temperature Service*

ASTM A194/A194M, *Carbon and Alloy Steel Nuts and Bolts for High-Pressure and High-Temperature Service*

ASTM A320/A320M, *Alloys-Steel Bolting material for Low-Temperature* service

ASTM A350/A350M, *Forgings, Carbon and Low-Alloy Steel, Requiring Notch Toughness Testing for Piping Components*

ASTM A351/A351M, *Casting, Austenitic, Austenitic-Ferritic (Duplex), for Pressure-Containing Parts*

ASTM A536/A536M, *Standard Specification for Ductile Iron Castings*

ASTM A694/694M, *Forgings, Carbon and Alloy Steel, for Pipe Flanges, Fittings, Valves, and Parts for High-Pressure Transmission service*

ASTM E186, *Reference Radiographs for Heavy-Walled (2 to 41/2-in. (50.8 to 114-mm)) Steel Castings*

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ASTM E446, *Reference Radiographs for Steel Castings up to 2 in. in Thickness*

ASME Sec. V, *Non-destructive Examination*

ASME Sec. VIII, *Pressure vessels*

API 598, *Valve Inspection and Testing*

MSS-SP-55, *Quality Standard for Steel Castings for Valves, Flanges and Fittings and other Piping Components (Visual Method)*

BS 1873, *Specification for steel globe and globe stop and check valves (flanged and butt-welding ends) for the petroleum, petrochemical and allied industries*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
nominal diameter
DN
alphanumeric designation of size for components of a pipework system, used for reference purposes which comprises the letters DN followed by a dimensionless whole number that is related to the physical size, in millimetres, of the bore or outside diameter of the end connections

Note 1 to entry: The number following the letters DN does not represent a measured value and shall not be used for calculation purposes except where specified in the relevant standard.

Note 2 to entry: In those standards that use the DN designation system, any relationship between DN and component dimensions shall be given, e.g. DN/OD or DN/ID.

3.2
nominal pressure
PN
numerical designation relating to pressure that is a convenient round number for reference purposes

Note 1 to entry: It is intended that all equipment of the same nominal size (DN) designated by the same PN number shall have the same mating dimensions appropriate to the type of end connections.

Note 2 to entry: The permissible working pressure depends upon materials, design and working temperature and has to be selected from the pressure / temperature rating tables in corresponding standards.

3.3
nominal pipe size
NPS
dimensionless number for the purpose of pipe, flange, or flanged fitting end connection size identification

Note 1 to entry: The number is not necessarily the same as the flange or flanged fitting inside diameter.

3.4
class
alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipework system, which comprises the word “class” followed by a dimensionless whole number

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