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**Petroleum and natural gas industries —  
Pipeline transportation systems —  
Pipeline valves**

*Industries du pétrole et du gaz naturel — Systèmes de transport  
par conduites — Robinets de conduites*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

This International Standard was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

Annexes B, C and D form a normative part of this International Standard. Annex A is for information only.

## Introduction

This International Standard is based on API Specification 6D, twenty-first edition, March 1994.

Users of this International Standard should be aware that further or differing requirements may be needed for individual applications. This International Standard is not intended to inhibit a vendor 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. Where an alternative is offered, the vendor should identify any variations from this International Standard and provide details.

# Petroleum and natural gas industries — Pipeline transportation systems — Pipeline valves

## 1 Scope

This International Standard specifies requirements and gives recommendations for the design, manufacturing, testing and documentation of ball, check, gate and plug valves for application in pipeline systems meeting the requirements of ISO 13623 for the petroleum and natural gas industries.

Valves for pressure ratings exceeding PN 420 (Class 2500) are not covered by this International Standard.

Annex A of this International Standard provides guidelines to assist the purchaser with valve type selection and specification of specific requirements when ordering valves.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

NOTE Non-International Standards may be replaced, by agreement, with other recognized and equivalent national or industry standards.

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*.

ISO 148, *Steel — Charpy impact test (V-notch)*.

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*.

ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges*.

ISO 5208, *Industrial valves — Pressure testing of valves*.

ISO 7005-1, *Metallic flanges — Part 1: Steel flanges*.

ISO 10474, *Steel and steel products — Inspection documents*.

ISO 10497, *Testing of valves — Fire type-testing requirements*.

ISO 13623, *Petroleum and natural gas industries — Pipeline transportation systems*.

ASME B1.1, *Unified inch screw threads (UN and UNR thread form)*.

ASME B1.20.1, *Pipe threads, General purpose (inch).*

ASME B16.5, *Pipe flanges and flanged fittings — NPS 1/2 through NPS 24.*

ASME B16.10, *Face-to-face and end-to-end dimensions of valves.*

ASME B16.25:1997, *Buttwelding ends.*

ASME B16.34:1996, *Valves — Flanged, threaded, and welding end.*

ASME B16.47, *Larger diameter steel flanges — NPS 26 through NPS 60.*

ASME B31.4:1992, *Liquid transportation systems for hydrocarbons, liquid petroleum gas, anhydrous ammonia, and alcohols.*

ASME B31.8:1995, *Gas transmission and distribution piping systems.*

ASME Boiler and Pressure Vessel Code:1998, Section V, *Non destructive examination.*

ASME Boiler and Pressure Vessel Code:1998, Section VIII, Division 1, *Rules for construction of pressure vessels.*

ASME Boiler and Pressure Vessel Code:1998, Section VIII, Division 2, *Alternative rules for construction of pressure vessels.*

ASME Boiler and Pressure Vessel Code, Section IX, *Qualification standard for welding and brazing procedures, welders, brazers, and welding and brazing operators.*

(American Society of Mechanical Engineers, 345 East 47<sup>th</sup> Street, NY 10017-2392, USA)

ASNT SNT-TC-1A, *Recommended Practice No. SNT-TC-1A.*

(American Society of Non-Destructive Testing, P.O. Box 28518, 1711 Arlingate Lane, Columbus, OH 43228-0518, USA)

ASTM A 193/A 193M, *Standard specification for alloy-steel and stainless steel bolting materials for high-temperature service.*

ASTM A 320/A 320M, *Standard specification for alloy steel bolting materials for low-temperature service.*

ASTM A 370, *Standard test methods and definitions for mechanical testing of steel products.*

ASTM A 388/A 388M, *Standard practice for ultrasonic examination of heavy steel forgings.*

ASTM A 435/A 435M, *Standard specification for straight-beam ultrasonic examination of steel plates.*

ASTM A 577/A 577M, *Standard specification for ultrasonic angle-beam examination of steel plates.*

ASTM A 609/A 609M:1997, *Standard practice for castings, carbon, low-alloy, and martensitic stainless steel, ultrasonic examination thereof.*

(American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA)

AWS QC1, *Standard for AWS certification of welding inspectors.*

(The American Welding Society, 550 NW LeJeune Road, Miami, FL 33126, USA)

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels.*

EN 288-3, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels.*



EN 473:1993, *Qualification and certification of NDT personnel — General principles.*

(CEN, European Committee for Standardization, Central Secretariat, Rue de Stassart 36, B-1050, Brussels, Belgium)

MSS SP-44, *Steel pipeline flanges.*

(Manufacturers Standardization Society of the Valve & Fittings Industry Inc., 127 Park Street N.E., Vienna, Virginia 22180, USA)

NACE MR 0175, *Sulfide stress cracking resistant metallic materials for oilfield equipment.*

NACE TM 0177, *Laboratory testing of metals for resistance to specific forms of environmental cracking in H<sub>2</sub>S environments.*

NACE TM 0284, *Evaluation of pipeline and pressure vessel steels for resistance to hydrogen-induced cracking.*

(National Association of Corrosion Engineers, P.O. Box 218340, Houston, Texas 77218, USA)

### 3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply:

#### 3.1

##### **ANSI rating class**

numerical pressure design class defined in ASME B16.5 and used for reference purposes

NOTE The ANSI rating class is designated by the word "Class" followed by a number.

#### 3.2

##### **bi-directional valve**

valve designed for blocking the fluid in both downstream and upstream directions

#### 3.3

##### **bleed**

drain or vent

#### 3.4

##### **block valve**

gate, plug or ball valve that blocks flow into the downstream conduit when in the closed position

NOTE Valves are either single- or double-seated, bi-directional or uni-directional.

#### 3.5

##### **breakaway thrust**

##### **breakaway torque**

thrust or torque required for opening a valve with maximum pressure differential

#### 3.6

##### **by agreement**

agreed between manufacturer and purchaser

#### 3.7

##### **double-block-and-bleed (DBB) valve**

valve with two seating surfaces which, in the closed position, blocks flow from both valve ends when the cavity between the seating surfaces is vented through a bleed connection provided on the body cavity

#### 3.8

##### **drive train**

all parts of a valve drive between the operator and the obturator, including the obturator but excluding the operator