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**Steel gate, globe and check valves for sizes  
DN 100 and smaller, for the petroleum and  
natural gas industries**

*Robinets-vannes, robinets à soupape et clapets de non-retour en acier de  
dimensions DN 100 et inférieures, pour les industries du pétrole et du gaz  
naturel*



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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.

Draft 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.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15761 was prepared by Technical Committee ISO/TC 153, *Valves*, Subcommittee SC 1, *Design, manufacture, marking and testing*.

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

## Introduction

The purpose of this International Standard is to establish basic requirements and practices for socket-welding, butt-welding, threaded and flanged end, steel gate, globe and check valves with reduced body seat openings, whose general construction parallels that specified by the American Petroleum Institute standard API 602<sup>[1]</sup> and the British Standard BS 5352<sup>[2]</sup>.

The form of this International Standard corresponds to ISO 6002<sup>[3]</sup> and ISO 10434<sup>[4]</sup>. However, it is not the purpose of this International Standard to replace ISO 6002, ISO 10434 or any other International Standard not identified with petroleum or natural gas industry applications.

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# Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries

## 1 Scope

This International Standard specifies the requirements for a series of compact steel gate, globe and check valves for petroleum and natural gas industry applications.

It is applicable to valves of

- nominal sizes DN 8, 10, 15, 20, 25, 32, 40, 50, 65, 80 and 100,
- corresponding to nominal pipe sizes NPS 1/4, 3/8, 1/2, 3/4, 1, 1 1/4, 1 1/2, 2, 2 1/2, 3 and 4,

and to pressure designations of Class 150, Class 300, Class 600, Class 800 and Class 1500.

Class 800 is not a listed class designation, but is an intermediate class number widely used for socket welding and threaded end compact valves.

It includes provisions for the following valve characteristics:

- outside screw with rising stems (OS & Y), in sizes  $8 \leq DN \leq 100$  and pressure designations  $150 \leq \text{Class} \leq 1500$  including Class 800;
- inside screw with rising stems (ISRS), in sizes  $8 \leq DN \leq 65$  and pressure designations of Class  $\leq 800$ ;
- socket welding or threaded ends, in sizes  $8 \leq DN \leq 65$  and pressure designations of Class 800 and Class 1500;
- flanged or butt-welding ends, in sizes  $15 \leq DN \leq 100$  and pressure designations of  $150 \leq \text{Class} \leq 1500$ , excluding flanged end Class 800;
- bonnet joint construction — bolted, welded, threaded with seal weld, and union nut for nominal pressure rating Class  $\leq 800$ ;
- body seat openings;
- materials, as specified;
- testing and inspection.

This International Standard is applicable to valve end flanges in accordance with ASME B16.5 and valve body ends having tapered pipe threads to ISO 7-1 or ASME B1.20.1. It is applicable to extended body construction in sizes  $15 \leq DN \leq 50$  and pressure designations of Class 800 and Class 1500, and to bellows and bellows assembly construction as may be adaptable to gate or globe valves in sizes  $8 \leq DN \leq 50$ . It covers bellows stem seal type testing requirements.

## 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.

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

ISO 7-2, *Pipe threads where pressure-tight joints are made on the threads — Part 2: Verification by means of limit gauges*

ISO 2902, *ISO metric trapezoidal screw threads — General plan*

ISO 2903, *ISO metric trapezoidal screw threads — Tolerances*

ISO 2904, *ISO metric trapezoidal screw threads — Basic dimensions*

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

ISO 5209, *General purpose industrial valves — Marking*

ISO 5752, *Metal valves for use in flanged pipe systems — Face-to-face and centre-to-face dimensions*

ISO 6708:1995, *Pipework components — Definition and selection of DN (nominal size)*

ISO 9606-1, *Approval testing of welders — Fusion welding — Part 1: Steels*

ISO 9956-1, *Specification and approval of welding procedures for metallic materials — Part 1: General rules for fusion welding*

ISO 9956-2, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedure specification for arc welding*

ISO 9956-3, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for arc welding of steels*

ISO 9956-4, *Specification and approval of welding procedures for metallic materials — Part 4: Welding procedure tests for the arc welding of aluminium and its alloys*

ISO 9956-5, *Specification and approval of welding procedures for metallic materials — Part 5: Approval by using approved welding consumables for arc welding*

EN 10269, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

ASME<sup>1)</sup> B1.5, *Acme screw threads*

ASME B1.8, *Stub Acme screw threads*

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

ASME B16.5, *Pipe flanges and flanged fittings*

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

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

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

ASTM A193, *Standard specification for alloy-steel and stainless steel bolting materials for high-temperature service*

1) American Society of Mechanical Engineers



ASTM A194, *Standard specification for carbon and alloy steel nuts for bolts for high-pressure or high-temperature service, or both*

ASTM A307, *Standard specification for carbon steel bolts and studs, 60 000 PSI tensile strength*

### 3 Terms and definitions

For the purposes of this International Standard, the terms and definitions of class and nominal pipe size given in ASME B16.34 and the following term and definition apply.<sup>2)</sup>

#### 3.1

##### nominal size

##### DN

alphanumeric designation of size for components of a pipe work system, used for reference purposes, comprising the letters "DN" followed by a dimensionless whole number indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections

NOTE 1 The number following "DN" does not represent a measurable value and should not be used for calculation purposes except where specified in the relevant standard.

NOTE 2 In those standards which use the DN designation system, any relationship between DN and component dimensions should be given, e.g. DN/OD or DN/ID.

(Adapted from ISO 6708:1995, definition 2.1.)

### 4 Pressure/temperature ratings

#### 4.1 Valve ratings

##### 4.1.1 Applicability

The pressure/temperature ratings applicable to valves specified in this International Standard shall be in accordance with those specified in the tables of ASME B16.34 for standard class for the applicable material specification and class designation.

##### 4.1.2 Interpolated ratings

Pressure/temperature ratings for Class 800 shall be determined by the equation:

$$p_8 = \frac{1}{3} p_6 + \frac{2}{3} p_9$$

where

$p_8$  is the pressure at the specified temperature, expressed in bars<sup>3)</sup>, for Class 800 rounded to the nearest 0,1 bar (= 10 kPa);

$p_6$  is the listed pressure, at the specified temperature, for Class 600, expressed in bars;

$p_9$  is the listed pressure, at the specified temperature, for Class 900, expressed in bars.

2) Pressure designation Class 800 has been added in order to identify widely used socket welding and threaded end valves having intermediate pressure/temperature ratings. It is not available for flanged end valves.

3) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>