Bolted Bonnet Steel Gate Valves for Petroleum and Natural Gas Industries

ANSI/API STANDARD 600
ELEVENTH EDITION, OCTOBER 2001
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ISO 10434:2001 (Modified), Bolted bonnet steel gate valves for the petroleum, petrochemical and allied industries

Contents

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 a number of 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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This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this standard or comments and questions concerning the procedures under which this standard was developed should be directed in writing to the standardization manager, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

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Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

API Foreword

This standard is under the jurisdiction of the API CRE Subcommittee on Piping. This API standard is a modified adoption of the English version of ISO 10434: 1998. ISO 10434 was prepared by Technical Committee ISO/TC 153, Valves, SC1, Design, manufacture, marking and testing and ISO/TC67, materials, equipment and offshore structures for petroleum and natural gas industries, SC6, processing equipment and systems.

In this standard, certain modifications have been made. These technical deviations have been incorporated. A complete list of modifications is given in API Standard Annex C.

For the purposes of this standard, the following editorial changes have been made:

Addition of API Special Notes, API Foreword, and Important information Concerning Use of Asbestos or Alternate Materials

This standard shall become effective on the date printed on the cover but may be used voluntarily from the date of publication.

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Suggested revisions are invited and should be submitted to the API Standards Department, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

ISO 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 part of ISO 10434 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 10434 was prepared by Technical Committee ISO/TC 153, *Valves*, Subcommittee SC 1, *Design, manufacture, marking and testing*, and ISO/TC 67, *Materials equipment and offshore structures for petroleum and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

Annexes A, B and C of this International Standard are for information only. Annex C contains modifications to ISO 10434: 1998. These modifications have been embedded into this API 600/ISO 10434 version.

Introduction

The purpose of this International Standard is to establish, in ISO format, the basic requirements and practices for flanged and butt-welding end steel gate valves of bolted bonnet construction which parallel those given in American Petroleum Institute Standard API 600, Tenth Edition. In order to maintain compatibility with the flanges defined in ISO 7005-1 and the flanges in the American National Standard ASME B16.5, valves have been designated to be PN-marked for the former and Class-marked for the latter. It is not the purpose of this International Standard to replace ISO 6002 or any other International Standard which is not identified with petroleum refinery or natural gas industry applications. It does, however, supersede API 600, Tenth Edition.

Bolted bonnet steel gate valves for petroleum and natural gas industries

1 Scope

This International Standard specifies the requirements for a heavy duty series of bolted bonnet steel gate valves for petroleum refinery and related applications where corrosion, erosion and other service conditions indicate a need for full port openings, heavy wall sections and extra large stem diameters.

This specification sets forth the requirements for the following gate valve features:

— bolted bonnet;

— outside screw and yoke;

— rising stems;

— non-rising handwheels;

— single or double gate;

— wedge or parallel seating;

— metallic seating surfaces;

— flanged or butt-welding ends.

It covers valves of the nominal sizes DN:

25; 32; 40; 50; 65; 80; 100; 150; 200; 250; 300; 350; 400; 450; 500; 600

and is applicable for pressure designations PN:

20; 50; 110; 150; 260; 420

when metric sized bolt holes are provided in end flanges and PN designations are marked on the valve body.

It also covers valves of the corresponding nominal pipe sizes NPS:

1; $1\frac{1}{4}$; $1\frac{1}{2}$; 2; $2\frac{1}{2}$; 3; 4; 6; 8; 10; 12; 14; 16; 18; 20; 24

and applies for equivalent nominal Class ratings:

150; 300; 600; 900; 1 500; 2 500

when inch-sized bolt holes are provided in end flanges and Class designations are marked on the valve body.

It also covers additional marking requirements for valves that are PN (or Class) designated but have flanges drilled for inch (or metric) bolt holes.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of the publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*.

ISO 4200:1991, *Plain end steel tubes, welded and seamless — Dimensions*.

ISO 5208:1993, *Industrial valves — Pressure testing of valves*.

ISO 5209:1977, *General purpose industrial valves — Marking*.

ISO 5210:1991, *Industrial valves — Multi-turn valve actuator attachments*.

ISO 5752:— [1)], *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 7005-1:1992, *Metallic flanges — Part 1: Steel flanges*.

ISO 7268:1983, *Pipe components — Definition of nominal pressure*.

ASME B1.1:1989, *Unified inch screw threads (UN and UNR thread form)*.

ASME B1.5:1988 (R1994), *Acme screw threads*.

ASME B1.8:1988 (R1994), *Stub Acme screw threads*.

ASME B1.12:1987 (R1992), *Screw threads — Class 5 interference — Fit thread*.

ASME B1.20.1:1983 (R1992), *Pipe threads, general purpose (inch)*.

ASME B16.5:1996, *Pipe flanges and flanged fittings*.

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

ASME B18.2.2:1987 (R1993), *Square and hex nuts (inch series)*.

ASTM A193:1996, *Specification for alloy steel and stainless steel bolting materials for high-temperature service*.

ASTM A194:1996, *Specification for carbon and alloy steel nuts for bolts for high-pressure and high-temperature service*.

ASTM A307:1994, *Specification for carbon steel bolts and studs, 60 000 psi tensile strength*.

MSS SP-55:1985 (R1990), *Quality standard for steel castings, visual surface examination*.

1) To be published. (Revision of ISO 5752:1982)