

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

API STANDARD 600
FOURTEENTH EDITION, MAY 2021

ERRATA 1, APRIL 2024



American
Petroleum
Institute

Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed. The use of API publications is voluntary. In some cases, third parties or authorities having jurisdiction may choose to incorporate API standards by reference and may mandate compliance.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be used. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

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.

Users of this Standard should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

All rights reserved. No part of this work may be reproduced, translated, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the Publisher, API Publishing Services, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001-5571.

Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

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 publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, Suite 1100, Washington, DC 20001, standards@api.org.

Currently in preview, click buy full version

Contents

	Page
1 Scope.....	1
2 Normative References.....	1
3 Terms and Definitions.....	2
4 Pressure/Temperature Ratings.....	3
5 Design.....	3
5.1 Body Wall Thickness.....	3
5.2 Bonnet Wall Thickness.....	4
5.3 Body Dimensions.....	4
5.4 Bonnet.....	7
5.5 Bonnet-to-body Joint.....	7
5.6 Gate.....	8
5.7 Yoke.....	10
5.8 Stem and Stem Nut.....	11
5.9 Packing and Packing Box.....	13
5.10 Bolting.....	14
5.11 Operation.....	15
5.12 Bypasses and Other Auxiliary Connections.....	15
5.13 Fugitive Emission Design Requirement.....	16
6 Materials.....	16
6.1 Materials Other Than Trim Materials.....	16
6.2 Trim.....	17
7 Testing, Inspection, and Examination.....	18
7.1 Inspection and Examination.....	18
7.2 Pressure Tests.....	18
7.3 Repairs of Defects.....	18
8 Marking.....	23
8.1 General.....	23
8.2 Specific Markings.....	23
9 Preparation for Shipment.....	23
9.1 Coatings.....	23
9.2 Openings.....	23
9.3 Gate Position.....	24
9.4 Stem Packing.....	24
9.5 Packing.....	24
9.6 Purchase Order Information.....	24
Annex A.....	25
Annex B (normative) Information to be Specified by the Purchaser.....	26
Annex C (informative) Identification of Valve Terms.....	28
Annex D (informative) Valve Material Combinations.....	29

Contents

	Page
Annex E (informative) Wear Travel Measurement Technique	33
Bibliography.....	34

Figures

1	Identification of Terms	4
2	Types of Valve Gates	9
3	Wear Travel Detail	10
4	Backseat Contact Area for Integral Backseats and Backseat Bushings.....	17
C.1	Valve Nomenclature.....	28

Tables

1	Minimum Wall Thickness for Body and Bonnet	5
2	Minimum Inside Diameter for Sizes DN 800 to DN 1050 (NPS 30 to NPS 42) in classes 150 and 300.....	7
3	Minimum Wear Travel and Maximum Stem Projection	11
4	Minimum Stem Diameter	12
4	a—Permitted Undertolerance	12
5	Nominal Radial Width of Packing (Metric)	14
6	Nominal Radial Width of Packing (U.S. Customary).....	14
7	Materials for Parts.....	16
8	Nominal Seating Surface, Stem and Backseat Bushing or Weld-deposit Materials and Hardness.....	19
9	Trim Numbers and Alternative Trim Numbers	23
D.1	Material Combinations for Group 1 Body, Bonnet, and Cover Materials	29
D.2	Material Combinations for Group 2 Body, Bonnet and Cover Materials	30
D.3	Material Combinations for Group 3 Body, Bonnet, and Cover Materials	31
D.4	Alternative Body to Bonnet Bolting Materials.....	32

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

1 Scope

This 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 would indicate a need for full port openings, heavy wall sections, and large stem diameters.

This standard 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 pipe sizes DN:

- 25, 32, 40, 50, 65, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050;

corresponding to nominal pipe sizes NPS:

- 1, 1 1/4, 1 1/2, 2, 2 1/2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42;

and applies to pressure class designations:

- 150, 300, 600, 900, 1500, 2500.

This edition of API 600 states values in both metric and U.S. Customary units of measurement. These systems of units are to be regarded separately. The values stated in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems constitutes nonconformance with this standard.

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 598, *Valve Inspection and Testing*

API Standard 624, *Type Testing of Rising Stem Valves Equipped with Graphite Packing for Fugitive Emissions*