

Valve Inspection and Testing

API STANDARD 598
EIGHTH EDITION, MAY 2004



American
Petroleum
Institute

**Helping You
Get The Job
Done Right.SM**

Currently in preview, click buy full version

Valve Inspection and Testing

Downstream Segment

API STANDARD 598
EIGHTH EDITION, MAY 2004



**American
Petroleum
Institute**

**Helping You
Get The Job
Done Right.SM**

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.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations under local, state, or federal laws.

Information concerning safety and health risks and proper precautions with respect to particular materials and conditions should be obtained from the employer, the manufacturer or supplier of that material, or the material safety data sheet.

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.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. Sometimes a one-time extension of up to two years will be added to this review cycle. This publication will no longer be in effect five years after its publication, unless as an operative API standard or, where an extension has been granted, upon republication. Status of the publication can be ascertained from the API Standards department telephone (202) 682-8000. A catalog of API publications, programs and services is published annually and updated biannually by API, and available through Global Engineering Documents, 15 Inverness Way East, M/S C303B, Englewood, CO 80112-5775.

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 Director of the Standards department, 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 be addressed to the Director, Business Services.

API standards are published to facilitate the broad availability of proven, sound engineering and operating practices. These standards are not intended to obviate the need for applying sound engineering judgment regarding when and where these standards should be utilized. The formulation and publication of API standards 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.

All rights reserved. No part of this work may be reproduced, 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, 1220 L Street, N.W., Washington, D.C. 20005.

FOREWORD

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 federal, state, or municipal regulation with which this publication may conflict.

Suggested revisions are invited and should be submitted to API, Standards department, 1220 L Street, NW, Washington, DC 20005.

Currently in preview, click buy full versi

Currently in preview, click buy full version

CONTENTS

	Page
1 GENERAL.....	1
1.1 Scope	1
1.2 Referenced Publications	1
2 INSPECTION, EXAMINATION, AND SUPPLEMENTARY EXAMINATION ...	1
2.1 Inspection at the Valve Manufacturer's Plant	1
2.2 Inspection Outside the Valve Manufacturer's Plant	1
2.3 Inspection Notice	1
2.4 Extent of Inspection	2
2.5 Examination	2
2.6 Supplementary Examination	2
3 PRESSURE TESTS.....	2
3.1 Test Location	2
3.2 Test Equipment	2
3.3 Tests Required	2
3.4 High-pressure Closure Test	3
3.5 High-pressure Pneumatic Shell Test	3
3.6 Test Fluid	3
3.7 Test Pressures.....	3
3.8 Test Duration	3
3.9 Test Leakage	3
4 PRESSURE TEST PROCEDURES	6
4.1 General	6
4.2 Backseat Test	6
4.3 Shell Test	6
4.4 Low-pressure Closure Test	6
4.5 High-pressure Closure Test	7
5 VALVE CERTIFICATION AND RETESTING	7
5.1 Certification of Compliance	7
5.2 Re-testing	7
Tables	
1 Pressure Tests	2
B Pressure Tests	3
2 Shell Test Pressure.....	4
3 Other Test Pressures	4
4 Duration of Required Test Pressure	5
5 Maximum Allowable Leakage Rates for Closure Tests	5

NOTES TO PURCHASER

1. If required, the following will be specified in the purchase order:
 - a. Inspections by the purchaser at the valve manufacturer's plant (see 2.1).
 - b. Inspections by the purchaser outside the valve manufacturer's plant (see 2.2).
 - c. Address for inspection notices (see 2.3).
 - d. Any supplementary examination required (see 2.6).
 - e. Type of backseat test (see 3.2.2).
 - f. Low-pressure closure test (see 3.3.3, 3.3.4 and 4.4.2).
 - g. High-pressure closure test (see 3.4 and 4.5).
 - h. High-pressure pneumatic shell test (see 3.5).
 - i. Test fluid temperature for low temperature valves (see 3.6.1).
 - j. Use of a wetting agent in the test water (see 3.6.4).
 - k. Certificate of compliance (see 5.1).
2. If this standard is used for valves not covered by this standard, the purchaser will specify the extent to which the standard is to be applied.

Valve Inspection and Testing

1 General

1.1 SCOPE

1.1.1 This standard covers inspection, examination, supplementary examinations, and pressure test requirements for resilient-seated, nonmetallic-seated (e.g., ceramic), and metal-to-metal-seated valves of the gate, globe, plug, ball, check, and butterfly types. Resilient seats are considered to be:

- Soft seats, both solid and semi-solid grease type (e.g., lubricated plug).
- Combination soft and metal seats.
- Any other type valve designed to meet resilient seat leakage rates as specified in Table 5.

API Std 598 supplements the API standards that reference it, but it may also be applied to other types of valves by agreement between the purchaser and the valve manufacturer.

1.1.2 The inspection requirements pertain to examinations and testing by the manufacturer and any supplementary examinations that the purchaser may require at the valve manufacturer's plant. The test requirements cover both required and optional pressure tests at the valve manufacturer's plant.

1.1.3 The following tests and examinations are specified in this standard:

- Shell test.
- Backseat test.
- Low-pressure closure test.
- High-pressure closure test.
- Visual examination of castings.
- High-pressure pneumatic shell test.

1.2 REFERENCED PUBLICATIONS

1.2.1 The most recent editions of the following standards, codes, and specifications are cited in this standard:

ASME¹

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

B16.5 *Valves—Flanged, Threaded, and Welding End*

MSS²

SP-45 *Bypass and Drain Connections*

¹ASME International, 3 Park Avenue, New York, New York 10016. www.asme.org

²Manufacturers Standardization Society of the Valve and Fittings Industry, Inc., 127 Park Street, N.E., Vienna, Virginia 22180. www.mss-hq.com

SP-55 *Quality Standard for Steel Castings for Valves, Flanges and Fittings and Other Piping Components—Visual Method*

SP-91 *Guidelines for Manual Operation of Valves*

1.2.2 This standard supplements the following API valve standards:

API

Std 594 *Check Valves: Wafer, Wafer-Lug and Double Flanged Type*

Std 599 *Metal Plug Valves—Flanged, Threaded and Welding End*

Std 602 *Compact Steel Gate Valves—Flanged, Threaded, Welding and Extended Body Ends*

Std 603 *Corrosion-Resistant, Bolted Bonnet Gate Valves—Flanged and Butt-Welding Ends*

Std 608 *Metal Ball Valves—Flanged, Threaded, and Butt-Welding Ends*

Std 609 *Butterfly Valves: Double Flanged, Lug- and Wafer-Type*

2 Inspection, Examination, and Supplementary Examination

2.1 INSPECTION AT THE VALVE MANUFACTURER'S PLANT

The purchaser will specify in the purchase order his intention to inspect valves and witness tests and examinations at the valve manufacturer's plant. The purchaser's inspector shall have free access to any part of the plant concerned with manufacture of the valves whenever work on the order is under way.

2.2 INSPECTION OUTSIDE THE VALVE MANUFACTURER'S PLANT

When the purchaser specifies that the inspection will include shell components manufactured at locations other than the valve manufacturer's plant, these components shall be subject to the purchaser's inspection at the location where they are manufactured.

2.3 INSPECTION NOTICE

When inspection by the purchaser is specified, the valve manufacturer shall notify the purchaser 5 working days prior to the required valve testing and any specified supplementary inspections or examinations, addressing the notice as stated in the purchase order. The valve manufacturer shall also give the purchaser 5 working days' notice of where and when shell components manufactured outside the valve manufacturer's plant may be inspected, if such inspection is required.