



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	1 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

VALVES AND STOPS

Check Valves

1. SCOPE

This specification covers swing type steel check valves in sizes 2-inch and larger. Check valves will have pressure ratings corresponding to ANSI Class 150, 300, 400 and 600.

All check valves covered by this specification, when installed as a single component, may be installed without an installation pressure test. When an installation pressure test is required, maximum installation test pressure will not exceed the shell test pressure specified in Paragraph 5.1.

2. APPLICABLE DOCUMENTS

- 2.1 American National Standards Institute (ANSI) B1.20.1, "Pipe Threads (Except Dry Seal)."
- 2.2 American National Standards Institute (ANSI) B16.5, "Pipe Flanges and Flanged Fittings."
- 2.3 American National Standards Institute (ANSI) B16.10, "Face-to-Face and End-to-End Dimensions of Valves."
- 2.4 American National Standards Institute (ANSI) B16.34, "Steel Valves Flanged and Butt-Welding Ends."
- 2.5 American Petroleum Institute (API) Specification 6A, "Specification for Wellhead Equipment."
- 2.6 American Petroleum Institute (API) Specification 6D (23rd Edition, Apr. 2008), "Specification for Pipeline Valves."
- 2.7 ASTM International (ASTM) D 2000, "Standard Classification System for Rubber Products in Automotive Applications."
- 2.8 Manufacturers Standardization Society (MSS) Standard Practice (SP) 6, "Standard Finishes for Contact Surfaces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings."
- 2.9 Manufacturers Standardization Society (MSS) Standard Practice (SP) 25, "Standard Marking System for Valves, Fittings, Flanges and Unions."
- 2.10 Southwest Gas Material Specification (MS) B-1, "Flanges, Cast Iron and Steel."



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	2 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

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VALVES AND STOPS

Check Valves

2. APPLICABLE DOCUMENTS (Cont'd)

2.11 United States Department of Transportation (DOT), Code of Federal Regulations, Title 49, Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards".

NOTE: Unless otherwise specified, the editions of the above document incorporated by DOT 49 CFR 192 are applicable. The above documents, and parts of documents (including annexes), not incorporated by 49 CFR 192 are incorporated by this Material Specification and will be the most recent edition. If a conflict exists between the applicable documents and/or this Material Specification, the requirements of 49 CFR 192 shall govern, and in the event of all other conflicts, the more stringent requirement shall govern.

3. TERMINOLOGY

3.1 General

3.1.1 "Southwest Gas," "Southwest" or "SWG" wherever used in this specification and other related documents will refer exclusively to Southwest Gas Corporation.

3.1.2 The terms "approved," "as approved," "satisfactory," "as directed," "or equal" or other similar terms wherever used in this specification and other related documents will mean "as determined by Southwest Gas," unless specifically stated otherwise.

3.1.3 "Product Information Package" or "PIP" wherever used in this specification and other related documents will mean the required information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	3 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

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VALVES AND STOPS

Check Valves

3. TERMINOLOGY (Cont'd)

- 3.2 CWP will mean "Cold Working Pressure" and is the maximum service pressure permitted in the ambient temperature range of -20°F to 100°F (-29°C to 38°C). CWP is expressed in psig (pounds per square inch gage).
- 3.3 WOG will mean "Water, Oil, and Gas" and is equivalent to CWP in Paragraph 3.2.
- 3.4 The following are ANSI Class ratings which correspond to cold working pressures (CWP) as recognized by Southwest Gas:

ANSI Class	CWP (psig)
150	275
300	720
400	960
600	1440

TABLE D-7.1

4. MATERIALS AND MANUFACTURING

- 4.1 Check valves manufactured to this specification will meet the minimum requirements of API Specification 6D, DOT 49 CFR 192 and all additional requirements defined in this material specification.
- 4.2 Valve Ends
 - Flanges will conform to ANSI 16.5 for steel flanges.
 - Thread ends will conform to the line pipe thread requirements of API Specification 6A in addition to API Specification 6D.
 - Weld ends will conform to ANSI B16.34.
- 4.3 The valve body, cover, clapper, etc. will be made with materials listed in API Specification 6D. The valve clapper will not be made from ductile (nodular) iron.
- 4.4 The clapper and cover seals will be compatible with natural gas and will conform to ASTM D-2000.



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	4 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

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VALVES AND STOPS

Check Valves

4. MATERIALS AND MANUFACTURING (Cont'd)

- 4.5 Upon agreement between the supplier and Southwest Gas, the valves will have a protective coating other than primer. This coating may be paint, epoxy or other corrosion and holiday inhibitors and will be specified on the purchase order. Coatings may be required to pass a holiday test outlined in Paragraph 5.2 of this specification.
- 4.6 The check valve will be full opening in accordance with API Specification 6D.
- 4.7 The valve hinge pin and clapper will be designed to prevent galling and seizure of the hinge assembly without the use of oil or grease.
- 4.8 The check valve will be designed with a horizontal hinge pin. The clapper will use gravity to close under no flow conditions.
- 4.9 Check valves may be required to use a clapper dampening device or have an extended hinge pin for use with such device.
- 4.10 Southwest Gas may require the check valve to have a lock open device on the outside of the valve. This will prevent the clapper from closing when engaged.
- 4.11 The check valve may be required to have a drain or similar tapped connection on the downstream side of the valve.

5. PERFORMANCE REQUIREMENTS

- 5.1 Each check valve will be subjected to a hydrostatic shell and seat test in accordance with API Specification 6D. Minimum test pressure and test durations are shown below. Southwest reserves the right to require an additional air seat test or higher hydrostatic test pressures.

CHECK VALVE TEST PRESSURES (psig)			
VALVE CLASS	SHELL HYDROSTATIC	SEAT HYDROSTATIC	SEAT AIR
150	425	300	80
300	1100	800	80
400	1450	1060	80
600	2175	1600	80

TABLE D-7.2



SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	5 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

VALVES AND STOPS
Check Valves

5. PERFORMANCE REQUIREMENTS (Cont'd)

DURATION OF HYDROSTATIC TESTS		
VALVE SIZE (inches)	SHELL TEST (minutes)	SEAT TEST (minutes)
2 through 4	2	2
6 through 10	5	5
12 through 18	15	5
20 and larger	30	5

TABLE D-7.3

- 5.2 When specified by Southwest Gas, epoxy or other electrically insulating coatings will pass a holiday detection test applicable for the specified type of coating.
- 5.3 All check valves will provide free unrestrictive flow in one direction and provide a bubble tight shutoff in the opposite direction as determine by a seat test in Section 5.1.

6. DIMENSIONS AND TOLERANCES

- 6.1 Flange dimensions and tolerances will conform to ANSI B16.5.
- 6.2 Thread ends dimensions and tolerances will conform to API Specification 6A.
- 6.3 Weld end dimensions and tolerances will conform to ANSI B16.34.
- 6.4 Face-to-face, end-to-end and face-to-end dimensions and tolerances will be in accordance to API Specification 6D and are shown in Appendix A of this document.



SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

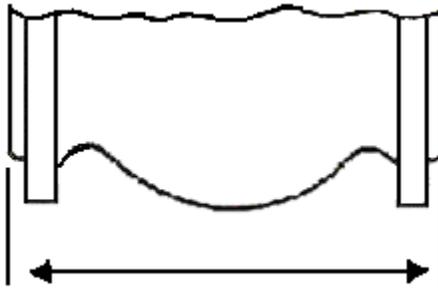
Section No:	MS D-7
Page No.:	6 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

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VALVES AND STOPS
Check Valves

APPENDIX A



FULL BORE CHECK VALVES				
NOMINAL PIPE SIZE (In.)	ANSI Class			
	150	300	400	600
2	8.00	10.50	11.50	11.50
2 1/2	8.50	11.50	13.00	13.00
3	9.50	12.50	14.00	14.00
4	11.50	14.00	16.00	17.00
6	14.00	17.50	19.50	22.00
8	19.50	21.00	23.50	26.00
10	24.50	24.50	26.50	31.00
12	27.50	28.00	30.00	33.00
16	34.00	34.00	35.50	39.00
20	38.50	40.00	41.50	47.00
24	51.00	53.00	55.00	55.00

NOTE: Dimensions are End to End.
All dimensions are in inches.
Both flanged end and weld end have the same dimensions in accordance with API 6D.

TABLE D-7.4



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	7 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

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VALVES AND STOPS

Check Valves

7. INSPECTION

- 7.1 Successful review of the Product Information Package (PIP) as well as any future reference by Southwest to the seller's part number or internal code number in any future contract or purchase, will mean only that no conflict with the specifications was found and will not relieve the seller from meeting all the requirements of this specification.
- 7.2 Southwest retains the option to inspect the manufacture and testing of all materials, products or systems referenced in this specification that are sold to SWG.
- 7.3 Southwest will make appropriate inspections and tests of all materials, products or systems supplied to this specification. SWG will have the right, at their option, to reject any material which fails to conform to this specification. Any such rejection may take place at the manufacturer's facility; the supplier's warehouse or any subsequent delivery location, before or after Southwest assumes possession. Notice of the rejection will be made promptly to the supplier by SWG. The defective product will be replaced or returned for credit at the manufacturer's expense.
- 7.4 Any changes in design or manufacturing of previously approved materials, products or systems described in this material specification for sale to Southwest must be approved by Southwest Engineering Staff. **Failure to obtain Southwest approval may be cause for rejection and disqualification as an approved supplier.**



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	8 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

Prepared By: Engineering Staff 

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VALVES AND STOPS

Check Valves

8. CERTIFICATION

The manufacturer's or supplier's certification will be furnished to Southwest. This certification will state that sample representing each lot have been manufactured, tested, and inspected in accordance with this specification and that all requirements have been met. When requested or specified in the purchase order or contract, a report of test results will be provided.

For components with material yield strength grades of 42,000 psi (X42) or greater and with nominal diameters of greater than 2 inches, testing documentation demonstrating the physical characteristics of the components which include, at a minimum, diameter, yield strength, ultimate tensile strength, wall thickness, seam type and chemical composition shall be provided to Southwest in accordance with 49 CFR 192.

Upon the request of Southwest, the certification of an independent third-party indicating conformance to the specification may be considered at Southwest's expense.

9. SAFETY DATA SHEETS

In accordance with law, the Seller will supply Safety Data Sheets for all applicable items supplied under this specification to the following:

- 1) The Receiving Location
- 2) Engineering Staff
- 3) Southwest Gas Corporation
Corporate Safety
Mail Station LVA-120
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

10.1 All valves will be marked according to MSS SP-25, "Standard Marking System for Valves, Fittings, Flanges and Unions." All valves will be marked in English units.

10.2 All check valves will have the direction of free flow stamped or casted into the side of the valve body.



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Section No:	MS D-7
Page No.:	9 of 10
Issue Date:	02/26/20
Superseded Date:	12/16/15

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VALVES AND STOPS

Check Valves

11. PACKAGING AND PACKAGE MARKING

Check valves with threaded ends will be free of paint and be plugged with thread protectors. Flange ends and weld ends will have a suitable protector to prevent damage to contact surfaces and prevent contamination of the valve. Flange contact faces will be free of protective coating.

12. STOCK CLASSIFICATION DESCRIPTION

VALVE, CHECK; ___ INCH WITH _____ ENDS (FLANGE, THREADED, WELD OR WELD X FLANGE); ANSI CLASS ___; _____ (APPROVED COATING IF OTHER THAN PRIMER i.e. EPOXY OR MANUFACTURES BRAND).