



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	1 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

1. SCOPE

This specification covers Quick Opening Closures in order to provide easy and economical accessibility to pipelines and other vessel applications. These types of closures vary between threaded or swing-bolt caps. The threaded closures are high pressure and swing-bolt closures are lower pressure.

2. APPLICABLE DOCUMENTS

- 2.1 American Society of Mechanical Engineers (ASME) B16.5-2003, "Pipe Flanges and Flanged Fittings", Designations and Pressures.
- 2.2 American Society of Mechanical Engineers (ASME) B31.4-2006, "Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids."
- 2.3 American Society of Mechanical Engineers (ASME) Section VIII, Division 1, "Boiler and Pressure Vessel Code."
- 2.4 Title 49, Code of Federal Regulations, Part 92, "Transportation of Natural and Other Gas by Pipelines Minimum Safety Standards" (49 CFR 192).

NOTE: Unless otherwise specified, the editions of the document incorporated in whole or in part by 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. In the event that 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.



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® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	2 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

3. TERMINOLOGY (Cont'd)

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.

4. MATERIALS AND MANUFACTURE

- 4.1 Pressure seals will be achieved by an O-ring that is set in the face of the hub.
- 4.2 The O-ring will be constructed of Nitrile (NBR) and the maximum operating temperature will be no greater than 250°F.
- 4.3 The threaded closures will be machined with a bevel seat to provide an accurate stabbing section and reduce the risk of thread and seal damage.
- 4.4 The thread length will be no more than 3” in order to insure greater safety and mechanical sealing.
- 4.5 Swing-Bolt closures will be manufactured with an ellipsoidal cap that is hinged to a hub.
- 4.6 The lugs on the hub will be heat treated; high tensile eye bolts that are pinned to lugs on the hub to enable the closure to swing clear of the cap after the nuts are loosened.

5. PERFORMANCE REQUIREMENTS

- 5.1 The Closures will be designed for use with high-strength, thin-wall pipe.
- 5.2 Closures shall be designed in such a way that would not allow any bleeding around the threads thus enabling the cap to remain attached to the hub.
- 5.3 Closures shall be designed in a way so that the weight of the closure cap is supported solely by the hinges.
- 5.4 All Closures will be capable, at a minimum, of withstanding a pressure test of 1.5 times the rated pressure with air or nitrogen.



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MATERIAL SPECIFICATION

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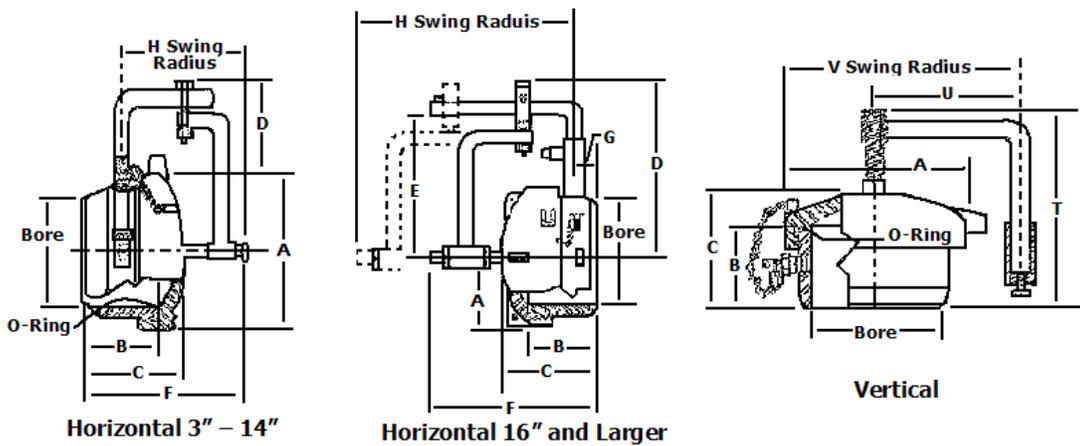
Section No: MS B-35
 Page No.: 3 of 12
 Issue Date: 12/11/18
 Superseded Date: 01/08/16

PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES

6.1 Quick Opening Closures:



ASME B16.5 Class Designations and Pressures				
Closure	ANSI Working Pressure -20°F to 100°F		Hydrostatic Test Pressure	
	Series	PSI	Bar	PSI
150	285	19.6	450	30
300	740	51.1	1125	77
400	990	68.1	1500	103
600	1480	102.1	2225	154
900	2220	153.2	3350	230
1500	3705	255.3	5575	383
2500	6170	425.5	9275	639

TABLE B-35.1

**SOUTHWEST GAS CORPORATION**

ENGINEERING STAFF

MATERIAL SPECIFICATION*Prepared By:* Engineering Staff*Approved By:* Jerome T. Schmitz

Section No:	MS B-35
Page No.:	4 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES (Cont'd)

6.2 Quick Opening Closures (Cont'd): NOTE-See manufacturer's specs to confirm Dimensions.

Closure Size & Series (Note 1)	A Cap O.D.	B Hub Length	C Cap/Hub Makeup	Horizontal			Vertical						
				D	E	F	G Min.	H Swing Radius	T Height	U	V Swing Radius		
2 - 150/900	4 3/8	2 5/8	3 1/4	NO HINGE									
3 - 150/900	5 1/2	2 5/8	3 1/4	6	N/A	7	N/A	8 3/4	7	7	8 3/4		
4 - 150/900	6 3/4	3 1/2	5	7	N/A	8	N/A	9 1/4	7	8	9 1/4		
6 - 150/600	9 3/4	4 1/2	5 3/4	9	N/A	10 1/2	N/A	13	11	8	13		
8 - 150/600	11 1/4	5	6 3/4	9 1/2	N/A	11	N/A	15	12	8 1/2	14 1/4		
8 - 900	12 1/4	5 1/2	7 3/4	13 1/2	N/A	13 1/2	N/A	16	14 1/4	9	15 1/4		
10 - 150/600	13 7/8	5 1/2	8	14 3/4	N/A	13 1/2	N/A	18	14 1/4	11 1/2	18 1/2		
10 - 900	15 3/8	5 1/2	10 1/2	15 1/2	N/A	13 1/4	N/A	18	14	12 3/4	20		
12 - 150/600	15 3/8	5 1/2	8	15 1/2	N/A	13 1/2	N/A	20	14 1/4	12 3/4	20		
12 - 900	16 3/4	5 1/2	11 1/4	15 1/2	N/A	13 1/4	N/A	20	13 1/2	12 1/2	21		
14 - 150/600	18	5 1/2	8	17 1/4	N/A	13 1/2	N/A	22	14 1/4	13	22		
14 - 900	18 3/4	8 1/2	14 1/4	24	20	24 3/4	22	32	24	18 3/4	28		
16 - 150/600	19 7/8	9 1/4	14 1/2	24 3/4	20 3/8	25 3/4	2 1/4	33	25	20	30		
16 - 900	20 7/8	10	15 3/4	24 3/4	20 3/8	26 1/4	3	33	26 1/4	20	30 1/2		
18 - 150/600	22 1/8	9 1/4	15 1/4	25 3/4	21 3/8	26 3/4	2 1/4	33	25 3/4	21	32 1/4		
18 - 900	23 1/8	10	16	25 3/4	21 3/8	26 3/4	3	33	27	21	32 3/4		
20 - 150/600	24 3/8	11	16 3/4	27 1/2	27 3/8	27 1/2	3 1/4	47	27 1/2	22	34 1/4		
20 - 900	25 1/2	13	19 1/2	29 1/2	27 3/8	29 1/2	4 1/4	47	28 3/4	23	35 1/8		
22 - 150/600	26 7/8	11	17 3/4	28 1/2	28 7/8	28 1/2	4 1/4	47	28 1/4	23 1/4	36 3/4		
22 - 900	26 1/4	13	19 1/4	29 1/4	28 7/8	30	3 1/4	47	29 1/2	23 1/4	37 1/2		

TABLE B-35.2



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	5 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES (Cont'd)

6.3 Quick Opening Closures (Cont'd): NOTE- See manufacturer's specs to confirm dimensions.

Closure Size & Series (Note 1)	A Cap O.D.	B Hub Length	C Cap/Hub Makeup	Horizontal			Vertical				
				D	E	F	G Min.	H Swing Radius	T Height	U	V Swing Radius
24-150/600	29	11	19	35¾	30 3/8	29¼	3¼	48	29½	25¼	39
24 - 900	30 5/8	13	20½	35¾	30 3/8	33½	3¼	48	30	25¼	40
26 - 150/600	31 ¼	11	18½	35¾	31 3/8	32½	3¼	48	34½	27¾	43½
26 - 900	32 7/8	13	21¼	39¾	29¼	34¼	4¼	48			
28 - 150/600	33 ½	11	19	40¾	30¼	33¼	3¼	48	34½	28¾	45¾
28 - 900	35 1/8	13	21¾	40¾	30¼	34¼	4¼	48			
30 - 150/600	35 7/8	12	20½	41¾	31¼	33¾	3¼	48	36¼	29	47
30 - 900	37 ½	16	22¼	50¼	33¼	35¼	5	59			
32 - 150/600	38 3/8	12	21	42¾	32¾	34	3¼	48	36½	30	49¼
32 - 900	39 1/8	16	26¼	51¼	34¼	38¼	5	59			
34 - 150/600	40 ¼	12	21½	43¾	33¾	34½	3¼	48	36¾	31	51¼
34 - 900	42 3/8	16	27	51¼	34¼	39	5	59			
36 - 150/300	40 3/8	13	22¼	53¼	36¼	36	4	59	38½	36	56¼
36 - 400/600	42 3/8	15	25¼	53¼	36¼	38¼	5	59	40½	36	57¼
36 - 900	44 ½	16	27¼	53¼	36¼	40¼	5	59	52¼	37¾	59¾
38 - 150/300	42 ¾	14	23¾	54½	37½	37	4	60			
38 - 400/600	44 7/8	15	25¾	55½	38¼	38¾	5	59			
38 - 900	47	17	28¾	54½	37½	43¼	5	59			
40 - 150/300	44 7/8	13	23½	55¼	39½	37½	5	59			
40 - 400/600	47	15	26¼	55½	38¼	39	5	59	41¼	38	61½
42 - 150/300	46 7/8	13	23¾	56½	39¼	37¾	4	60			
42 - 400/600	49 ¼	15	26¾	56½	39¼	39½	5	60	41¾	39	63 3/4

Note 1: All Dimensions Nominal. Dimensions are for higher numbered series shown. Dimension drawings upon request at time of order.
 Sizes 44" and larger available upon request.
 NA-Not applicable.

TABLE B-35.2
(Cont'd)



SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

Section No:	MS B-35
Page No.:	6 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

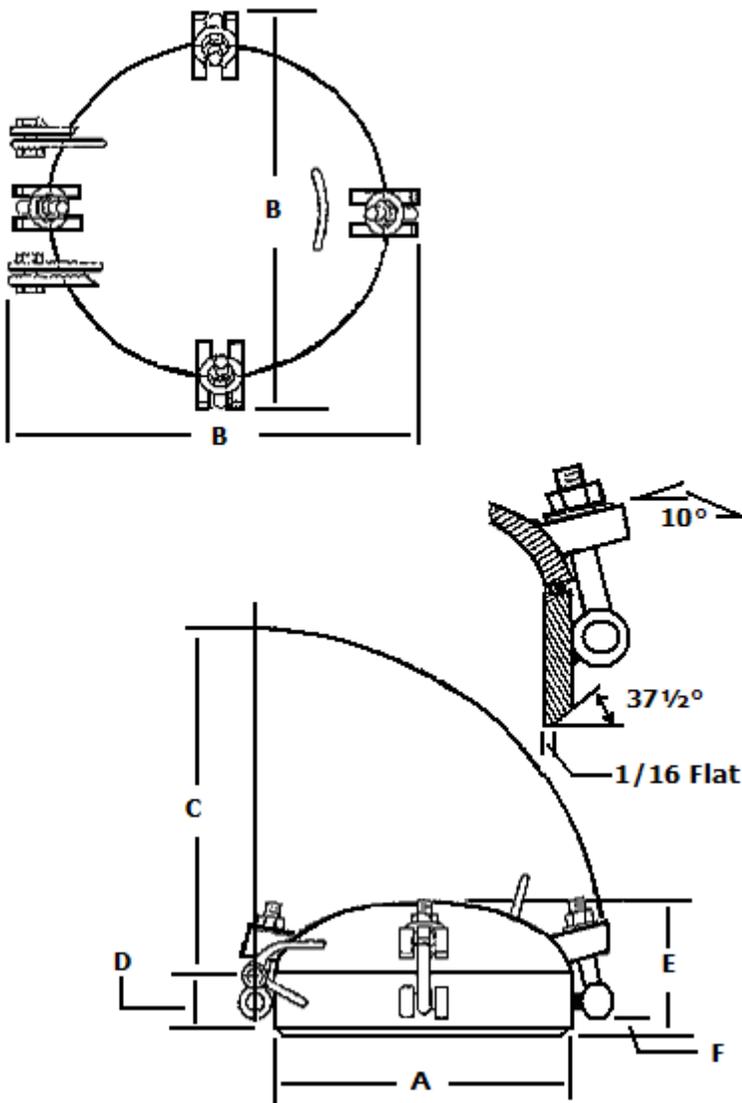
Prepared By: Engineering Staff 
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PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES

6.4 Swing-Bolt Closures:





SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	7 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES (Cont'd)

6.5 Swing-Bolt Closures (Cont'd):

Size	Working Pressure (PSI)			Number of Bolts & Sizes			Weight (lbs.)			Force Required to Lift Cap (lbs.)		
	Type			Type			Type			Type		
	100	200	300	100	200	300	100	200	300	100	200	300
8		240	300		3 -5/8	4 -5/8		27	30		9	10
10	150	200	300	3 -5/8	4 -5/8	5 ¾	35	40	45	11	12	15
12	120	200	300	3 -5/8	4 -¾	6 ¾	42	50	60	14	18	20
14	100	200	300	3 -5/8	5 -¾	8 ¾	49	70	78	16	21	26
16	100	200	300	4 -5/8	6 -¾	9 ¾	65	80	90	22	27	30
18	115	200	300	4 -¾	6 -7/8	9 -7/8	87	110	125	29	33	42
20	95	200	300	4 -¾	7 -7/8	9-1	105	135	160	35	46	54
22	115	200	300	6 -¾	7-1	10-1	140	165	200	47	49	68
24	110	200	300	5 -7/8	8-1	11-1¼	157	185	220	53	58	74
26	115	200	300	6 -7/8	9-1	14-1	185	210	285	62	66	96
28	115	200	300	7 -7/8	11-1	12-1¼	202	235	325	68	80	110
30	115	200	300	8 -7/8	9-1¼	12-1¼	239	334	375	81	120	127
32	110	200	275	9 -7/8	10-1¼	14-1¼	262	357	455	89	140	154
34	110	200	275	10- 7/8	11-1¼	16-1¼	285	405	509	96	155	173
36	115	200	275	9-1	12-1¼	18-1¼	318	447	565	108	175	192

TABLE B-35.3



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	8 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

6. DIMENSIONS AND TOLERANCES (Cont'd)

6.6 Swing-Bolt Closures (Cont'd):

Size	A OD	ID			B	C	D Min.	E Max.	F Min.
		100	200	300					
8	8 5/8	7 5/8	7 5/8	7 5/8	11	10 3/4	1 1/2	4 1/2	1/2
10	10 3/4	9 3/4	9 3/4	9 3/4	13 1/2	13	2 1/4	5 1/2	3/4
12	12 3/4	11 3/4	11 3/4	11 3/4	16	15 1/4	2 1/4	6	5/8
14	14	13	13	13	17 1/4	16 1/2	2 1/4	6 1/2	5/8
16	16	15	15	15	19 1/4	18 1/2	2 1/4	7	5/8
18	18	17	17	17	21 1/2	20 3/4	3	8	7/8
20	20	19	19	19	23 1/2	22 3/4	3	9	7/8
22	22	21	21	21	26	25	3 1/2	10	1
24	24	23	23	23	28	27	3 1/2	10 1/2	1
26	26	25	25	24 3/4	30	29	3 1/2	11	1
28	28	27	27	26 3/4	32	31	3	11 1/2	3/4
30	30	29	28 3/4	28 3/4	34 1/2	33 1/2	3 1/4	11 1/2	5/8
32	32	31	30 3/4	30 1/2	36 1/2	35 1/2	3 1/4	12	5/8
34	34	33	32 3/4	32 1/2	38 1/2	37 1/2	3 1/4	12 1/2	5/8
36	36	35	34 3/4	34 1/2	40 1/2	39 1/2	3 1/4	13	5/8

Note: Can be taper bored to match other
Dimensions are nominal

TABLE B-35.4



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

Section No:	MS B-35
Page No.:	9 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

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 specification was found, and will not relieve the Seller from meeting all the requirements of this specification.
- 7.2 SWG retains the option to inspect the manufacturing and testing of any and all materials, products or systems referenced in this specification that are sold to SWG.
- 7.3 SWG will make appropriate inspections and tests of any and all materials, products or systems supplied to this specification. SWG will have the right, at its 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 SWG 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 the manufacturing of previously approved materials, products or systems described in this material specification for sale to SWG, must be approved by SWG's Engineering Staff. **Failure to obtain SWG's approval may be cause for rejection and disqualification as an approved supplier.**

8. CERTIFICATION

The manufacturer's or supplier's certification will be furnished to Southwest. This certification shall state that samples 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

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



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

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Section No:	MS B-35
Page No.:	10 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

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

All products sold to Southwest will be marked with the following as a minimum:

- Manufacturer
- Pressure
- Size
- Type of Bolt
- ASME Code Stamp



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

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Section No:	MS B-35
Page No.:	11 of 12
Issue Date:	12/11/18
Superseded Date:	01/08/16

PIPE FITTINGS

Closures

11. PACKAGING

All products covered in this specification will be packaged to prevent damage during shipping.

12. STOCK CLASSIFICATION DESCRIPTION

CLOSURE, QUICK- OPENING, _____ INCH, ANSI _____.

CLOSURE, SWING-BOLT, _____ INCH, ANSI _____.