



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS B-6
Page No.:	1 of 11
Issue Date:	03/04/20
Superseded Date:	06/25/18

PIPE FITTINGS

Induction Bends

1. SCOPE

This specification covers integrally-reinforced forged branch outlet fittings commonly referred to as “weld-o-let”, “thread-o-let”, and “sock-o-let” fittings. These fittings are file welded to the main run of pipe and connect to branch piping by butt welding, threaded connection or socket welding. Table B-7.1 shows the types and sizes available.

Class of Fitting	Type	Branch Size	Pipe Wall for Design Pressure
Standard	Butt Welding	NPS 1/8-24	Standard
Extra Strong	Butt Welding	NPS 1/8-24	Extra Strong
Schedule 160	Butt Welding	NPS ½-6	Schedule 160
3000	Threaded & Socket Weld	NPS 1/8-4	Extra Strong
6000	Threaded & Socket Weld	NPS ½-2	Schedule 160

TABLE B-7.1

2. APPLICABLE DOCUMENTS

- 2.1 American National Standards Institute (ANSI) B-1.20.1, “NPT American National Standard Taper Pipe Thread.”
- 2.2 American National Standards Institute (ANSI) B-16.25, “Buttwelding Ends.”
- 2.3 Manufacturers Standardization Society Standard Practice (MSS SP) 97, “Integrally Reinforced Forged Branch Outlet Fittings-Socket Welding, Threaded and Buttwelding Ends.”
- 2.4 American National Standards Institute (ANSI) B-16.34, “Valves Flanged, Threaded and Welding Ends.”
- 2.5 American National Standard Institute (ANSI) B-16.11, “Forged Fittings, Socket Welding and Threaded.”



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2. APPLICABLE DOCUMENTS (Cont'd)

- 2.6 Title 49, Code of Federal Regulations, Title 49, Part 192, "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 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 technical product information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.



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4. MATERIALS AND MANUFACTURE

- 4.1 All integrally reinforced forged branch outlet fittings will be manufactured in accordance with MSS SP-97.
- 4.2 All butt weld ends will meet the requirements of ANSI B-16.25.
- 4.3 All threaded ends will meet the requirements of ANSI B-1.20.1.
- 4.4 All socket weld ends will meet the requirements of ANSI B-16.11.
- 4.5 Each fitting will have a design pressure equal to pipe of the same size, material and the wall thickness shown in Table B-7.1.
- 4.6 Each fitting will be manufactured in accordance with quality control procedures that ensure that it is equivalent to a prototype fitting that has been proof-tested in accordance with MSS SP-97.
- 4.7 The material for fittings shall consist of forgings, bars and seamless tubular products in which conform to the requirements for the melting process, chemical composition requirements and mechanical property requirements of the forging products form listed in Table I, ANSI B-16.34.

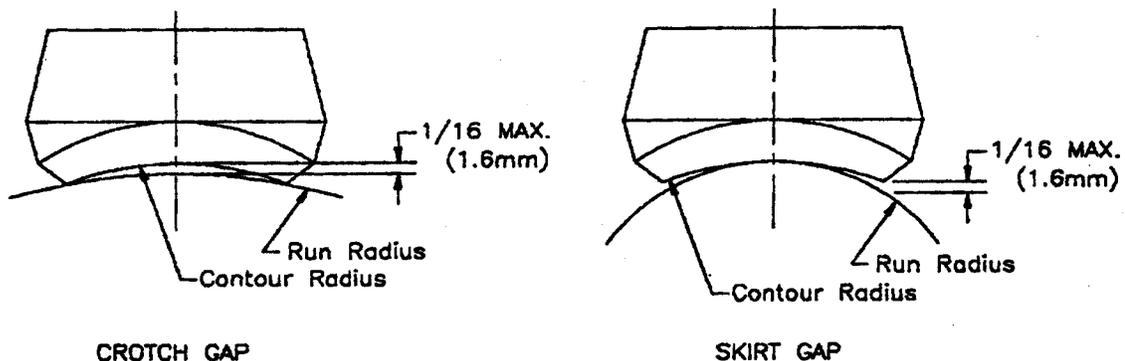


FIGURE B-7.1



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5. PERFORMANCE REQUIREMENTS

All fittings under this specification will be able to withstand a burst test at a pressure no less than the design pressure determined in accordance with paragraph 4.5 of this specification.

6. DIMENSIONS AND TOLERANCES

6.1 The dimensions for forged branch outlet fittings are shown in Appendix A.

6.2 All forged branch outlet fittings manufactured to this specification will meet the tolerance requirements of ANSI B-16.34.

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 all induction bends sold to SWG.

7.3 SWG will make appropriate inspections and tests of 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 rejection will be made promptly thereafter by SWG. The defective product will be replaced or returned for credit at the manufacturer's expense.

7.4 No changes will be made in the manufacturing of previously approved materials, products or systems described in this materials specification for sale to SWG, without prior approval by Southwest's Engineering Staff. **Failure to obtain SWG's approval may be cause for rejection and disqualification as an approved supplier.**



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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.

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



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10. PRODUCT MARKING

10.1 Each fitting will be marked with the following:

- Manufacturer's name or trademark
- Material Identification: the material shall be identified in accordance with the marking requirements of the applicable ASTM specifications.
- Class: The Fitting Class- "STD" (Standard), "XS" (Extra Strong), "SCH 160" (Schedule 160), "3000" or "6000". Alternately, the designation 3M or 6M as application may be used where "M" stands for 1,000.
- Size: The nominal size of the pipe which the fitting's marking identifies-Run (or consolidated range) NPS X Outlet NPS.

10.2 Where size and shape of fittings do not permit all the above markings, they may be omitted in the reverse order given above.

11. PACKAGING

11.1 All fittings will be packaged in a manner to prevent damage during transportation and storage.

11.2 The packaging will be marked with the following:

- Manufacturer's name or trademark
- Manufacturer's part name or number
- Size
- The Fitting Class
- Material Identification



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12. STOCK CLASSIFICATION DESCRIPTION

THREAD-O-LET, FORGED STEEL, _____-INCH X _____-INCH, STANDARD WEIGHT.

WELD-O-LET, FORGED STEEL, _____-INCH X _____-INCH X _____-INCH, A105, GRADE 11.

SOCK-O-LET, FORGED STEEL, _____-INCH X _____-INCH.



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APPENDIX A

BRANCH OUTLET HEIGHT- BUTT WELDING

(Dimensions in Inches)

OUTLET Nominal Pipe Size (Inches)	A (FACE OF FITTING TO CROTCH)					
	STANDARD		EXTRA STRONG		SCHEDULE 160	
	REDUCING	FULL	REDUCING	FULL	REDUCING	FULL
1/2	.75	.75	.75	.75	1.12	1.12
3/4	.88	.88	.88	.88	1.25	1.25
1	1.06	1.06	1.06	1.06	1.50	1.50
1 1/4	1.25	1.25	1.25	1.25	1.75	1.75
1 1/2	1.31	1.31	1.31	1.31	2.00	2.00
2	1.50	1.50	1.50	1.50	2.18	2.18
3	1.75	1.75	1.75	1.75	2.88	2.88
4	2.00	2.00	2.00	2.00	3.31	3.31
5	2.25	2.25	2.25	2.25	3.69	3.69
6	2.38	2.38	3.06	3.06	4.12	4.12
8	2.75	2.75	3.88	3.88		
10	3.06	3.06	3.69	3.50		
12	3.38	3.38	4.06	3.94		
16	3.69	3.69	4.18	4.44		
20	4.00	4.62	4.69	5.00		
24	4.56	5.38	5.50	5.50		
Tolerances:	1/8 - 3/4	±0.03"	5 - 12	±0.12"		
	1 - 4	±0.06"	14 - 24	±0.19"		



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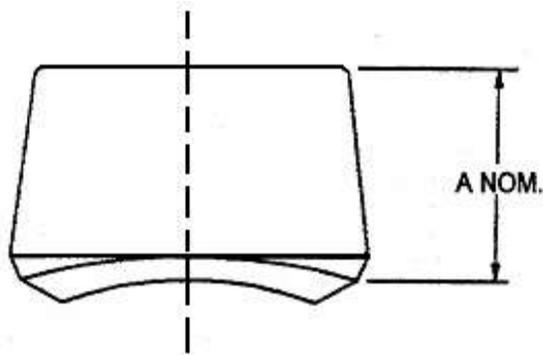
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**APPENDIX A
(Cont'd)**



OUTLET Nominal Pipe Size (Inches)	A (FACE OF FITTING TO CROTCH)	
	THREADED	
	3000	6000
1/4	.75	
3/8	.81	
1/2	1.00	1.25
3/4	1.06	1.44
1	1.31	1.56
1 1/4	1.31	1.62
1 1/2	1.38	1.69
2	1.50	2.06
3	2.00	
4	2.25	
TOLERANCES: 1/8 - 3/4 ± 0.03"		
1 - 4 ± 0.06"		



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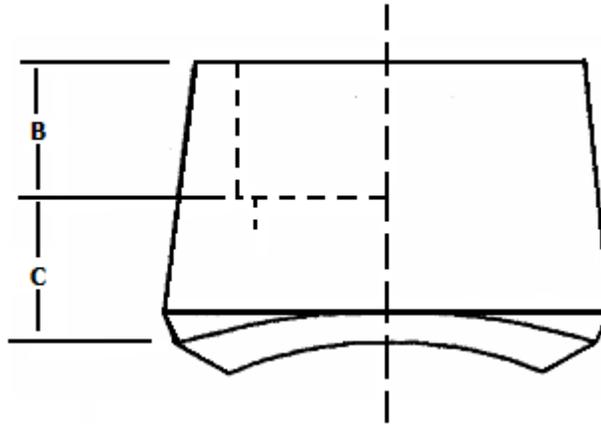
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APPENDIX A

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OUTLET Nominal Pipe Size (Inches)	B (Minimum) [1]	C (Maximum)	
		3000	6000
1/4	0.38	0.41	
3/8	0.38	0.50	
1/2	0.38	0.63	0.94
3/4	0.50	0.63	1.00
1 1/4	0.50	0.88	1.13
1 1/2	0.50	0.94	1.19
2	.62	0.94	1.25
3	.62	1.19	1.44
4	.75	1.19	

[1] B Socket minimum depth per ANSI B-16.11