



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS B-5
Page No.:	1 of 23
Issue Date:	02/05/19
Superseded Date:	06/20/18

PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

1. SCOPE

This specification covers 1/8-inch through 4-inch Class 150 and 1/4-inch through 3-inch Class 300 malleable iron threaded fittings of the following types:

MALLEABLE IRON FITTINGS	
Description	Type
Straight	90° elbows, tees, crosses, 45° elbows, couplings, plugs and caps.
Reducing	90° elbows, crosses, tees, bushings and couplings.
Street	90° elbows, 45° elbows and tees*.

TABLE B-5.1

Hexagonal head bushings and cored plugs are limited to a Class 150 rating. Solid plugs and face bushings have a Class 300 rating.

2. APPLICABLE DOCUMENTS

- 2.1 American National Standard Institute (ANSI), B-1.20.1 “NPT American National Standard Taper Pipe Thread.”
- 2.2 American National Standards Institute (ANSI) B-16.3, “Malleable Iron Threaded Fittings.”
- 2.3 American National Standards Institute (ANSI) B-16.14, “Ferrous Pipe Plugs, Bushings and Locknuts with Pipe Threads.”
- 2.4 American National Standard Institute (ANSI), Z-55.1 “Finishes for Industrial Apparatus and Equipment.”
- 2.5 ASTM International (ASTM) A-197, “Standard Specification for Cupola Malleable Iron.”
- 2.6 ASTM International (ASTM) D-3359-02B, “Standard Test Method for Measuring Adhesion by Tape Test.”



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2. APPLICABLE DOCUMENTS (Cont'd)

- 2.7 ASTM International (ASTM) D-3451-06, "Standard Guide for Testing Coating Powders and Powder."
- 2.8 ASTM International (ASTM) E-8, "Standard Test Methods for Tension Testing of Metallic Materials."
- 2.9 Manufacturers Standardization Society Standard Practice (MSS SP) 83, "Steel Pipe Unions Socket-Welding and Threaded."
- 2.10 Title 49, Code of Federal Regulations, Part 192, "Transportation of Natural and Other Gas by Pipeline; 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. 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.
- 3.1.4 The term "malleable iron" as defined by ASTM A-197 will denote fittings made by the Cupola process.



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4. MATERIALS AND MANUFACTURE

4.1 Fittings purchased to this specification will be manufactured, as a minimum, in accordance with ANSI B-16.3, ANSI B-16.14, ASTM A-197 and any additional requirements as defined in this specification.

NOTE: Gray cast iron is not an acceptable material.

4.2 Malleable iron fittings will possess the corresponding design pressures (shown in Table B-5.2) when used in gas piping at temperatures not exceeding 150°F.

MALLEABLE IRON DESIGN PRESSURES		
Class	Size (Inches)	Design Pressure (psig)
150 Lb. (Standard Weight)	All	300
300 Lb. (Extra Heavy)	1/4 – 1	2000
	1-1/4 – 2	1500
	2-1/2 – 3	1000
	All Street Elbows	600

TABLE B-5.2

4.3 Unless otherwise specified, all threaded pipe fittings shall be coated with an Industrial Gray Coating No. 49 per ANSI Z-55.1. The coating system used shall be one of the systems listed in Tables B-5.3 and B-5.4 or a pre-approved equivalent.

4.4 All fittings shall have tapered threads and shall be threaded in accordance with ANSI B-1.20.1.

4.5 The coating shall be a minimum of 3 mils thick, unless otherwise approved by Southwest Gas due to the coating process.

4.6 For paint coating systems, male (external threads) must be protected from painting on the first 4 threads. There must not be any major coating build-up on the threads. Overspray within the first 4 threads and on female threads is allowable so long as it does not exceed 0.5 mil thickness.

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4. MATERIALS AND MANUFACTURE (Cont'd)

- 4.7 For powder coating systems, male (external threads) must be masked from coating on the first 4 threads. No fitting shall have an excess of coating on any mating surface that inhibits mating fit and function. Mating and function are described as the ability to make fitting nipples to perform at least two full turns without benefit of a tool.
- 4.8 The powder coating application shall be electrostatic spray in accordance with the Corona Charging Method. The exterior coated surface shall be smooth and free of drips or excessive build up.

APPROVED PAINT SYSTEMS				
SYSTEM NUMBER	SURFACE PREPARATION	PRIMER COAT	INTERMEDIATE COAT	FINISH COAT
1	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	High-Build Polyamide Epoxy, DFT 4.0 to 5.0 Mils.	None	Aliphatic Polyurethane, 3.0 Mils.
2	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	Modified Alkyd, Inhibited, Chromate and Lead-Free, DFT 2.0 Mils.	Alkyd Enamel, DFT 1.5 to 2.0 Mils.	Alkyd Enamel, 3.0 Mils.
3	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	Aluminum Flake Epoxy Mastic, DFT 4.0 to 5.0 Mils.	None	Aliphatic Polyurethane, 3.0 Mils.
4	Solvent Cleaning (SSPC-SP 1)	None	None.	Urethane-Polyester Powder Coat 3.0 Mils.

TABLE B-5.3



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4. MATERIALS AND MANUFACTURE (Cont'd)

APPROVED PAINT SYSTEMS				
SYSTEM NUMBER	CARBOLINE	SHERWIN WILLIAMS	RUSTOLEUM	KRYLON
1 ¹	801	B58 T 104	9100 Series	
	834	B65 W 300 Series	9400 Series	
2 ¹	GP-818	B50 HZ 1	7669	6910
	Subsil B	B56 Series	7686	0871
3 ¹	Carbomastic 15	B62 S 100		
	834	B65 W 300 Series		
4	Vitra Coat or Approved Equal			

NOTE: ¹For each paint system, the top part number is for the primer and the bottom part number is for the top coat.

TABLE B-5.4

5. PERFORMANCE REQUIREMENTS

- 5.1 All iron used to make fittings to this specification will meet the tensile requirement of ASTM A-197. Testing procedures will conform to the requirements of ASTM E-8. All testing will include the yield strength and elongation at room temperature. Southwest may, at their discretion, require the results of such tests if specified on the purchase order.
- 5.2 All fittings under this specification will be capable of withstanding a leak test at the design pressure as stated in Paragraph 4.2.



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5. PERFORMANCE REQUIREMENTS (Cont'd)

5.3 Powder coated fittings shall be visually inspected for quality of finish before packing by observing the following:

- Consistent, complete coverage of exposed areas.
- Absence of surface contamination.
- Visual color comparison with QC approved color panel.
- Any unusual surface issues.
- Adhesion ASTM D-3359-02B (cross-hatch)
- Check special exposed/masking areas for proper coverage.

6. DIMENSIONS AND TOLERANCES

All malleable iron fittings, except plugs and bushings, manufactured to this specification will meet the dimension and tolerance requirements of ANSI B-16.3. Plugs and bushings manufactured to this specification will meet the dimensional and tolerance requirements of ANSI B-16.14. Detail dimensional information is included in Appendix A of this specification.



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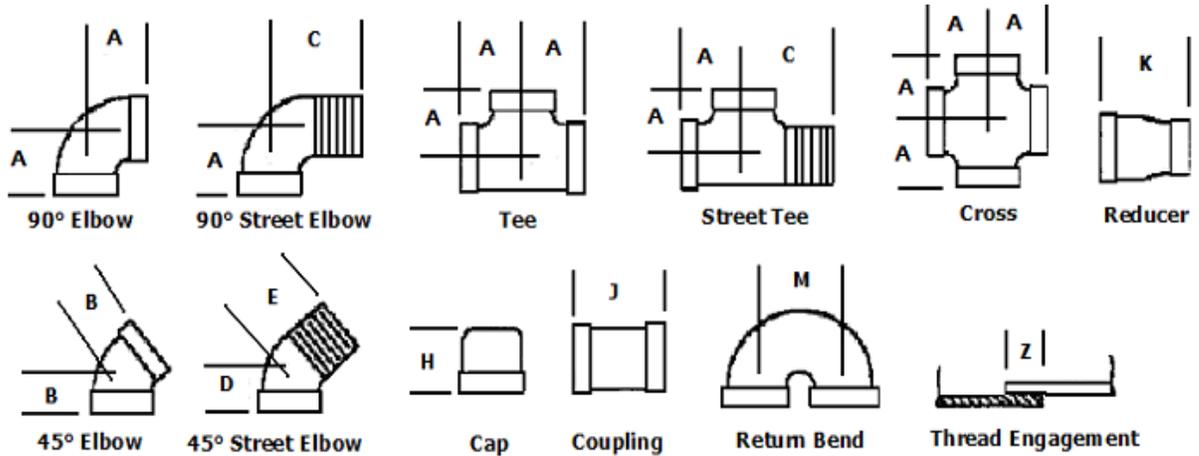
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APPENDIX A



150-LB. CLASS (Standard Weight) MALLEABLE IRON FITTING DIMENSIONS (Straight & Street Type)												
Size	A	B	C	D	E	H	J	K	Return Bends M			Z
									Close	Medium	Open	
1/8	11/16	1/2	1	11/16	13/16	9/16	15/16					1/4
1/4	13/16	3/4	1-3/16	5/8	15/16	5/8	1-1/16	1				3/8
3/8	15/16	13/16	1-7/16	11/16	1-1/16	3/4	1-3/16	1-1/8				3/8
1/2	1-1/8	7/8	1-5/8	13/16	1-3/16	7/8	1-5/16	1-1/4	1	1-1/4	1-1/2	1/2
3/4	1-5/16	1	1-7/8	15/16	1-5/16	1-1/16	1-1/2	1-7/16	1-1/4	1-1/2	2	9/16
1	1-1/2	1-1/8	2-1/8	1-11/16	1-1/2	1-3/16	1-11/16	1-11/16	1-1/2	1-7/8	2-1/2	11/16
1-1/4	1-3/4	1-5/16	2-7/16	1-1/4	1-11/16	1-1/4	1-15/16	2-1/16	1-3/4	2-1/4	3	11/16
1-1/2	1-15/16	1-7/16	2-11/16	1-3/8	1-7/8	1-5/16	2-1/8	2-5/16	2-3/16	2-1/2	3-1/2	11/16
2	2-1/4	1-11/16	3-1/4	1-11/16	2-1/4	1-7/16	2-1/2	2-13/16		3	4	3/4
2-1/2	2-11/16	1-15/16	3-13/16			1-13/16	2-7/8	3-1/4			4-1/2	15/16
3	3-1/8	2-3/16	4-1/2			1-15/16	3-3/16	3-11/16			5	1
3-1/2	3-7/16	2-3/8				1-15/16		4				1-1/16
4	3-3/4	2-5/8	5-11/16			2-1/16	3-11/16	4-3/8			6	1-1/8

NOTE: Dimensions are in inches.

TABLE B-5.5



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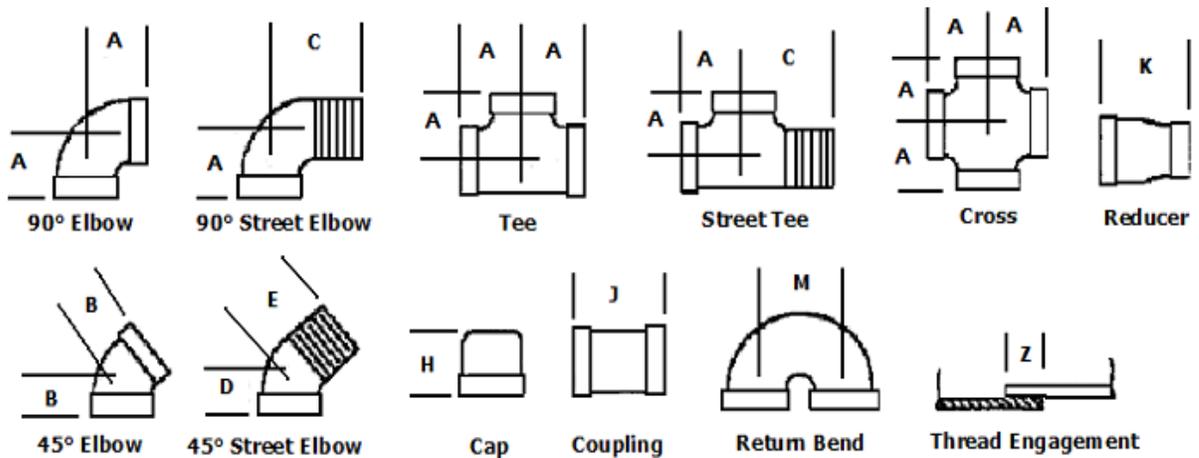
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APPENDIX B



300-LB. CLASS (Extra Heavy) MALLEABLE IRON FITTING DIMENSIONS (Straight & Street Type)												
Size	A	B	C	D	E	H	J	K	Return Bends M			Z
									Close	Medium	Open	
1/4	15/16	13/16	1-7/16			25/32	1-3/8					3/8
3/8	1-1/16	7/8	1-5/8			7/8	1-5/8	1-7/16				3/8
1/2	1-1/4	1	2	1	1-3/8	1-1/16	1-7/8	1-11/16				1/2
3/4	1-7/16	1-1/8	1-9/16	1-1/8	1-9/16	1-1/4	2-1/8	1-3/4				9/16
1	1-5/8	1-5/16	2-9/16	1-5/16	1-13/16	1-3/8	2-3/8	2	1-3/4	2-1/2	3	11/16
1-1/4	1-15/16	1-1/2	2-7/8	1-1/2	2-1/8	1-1/2	2-7/8	2-3/8	2-1/4	2-1/2	3	11/16
1-1/2	2-1/8	1-11/16	3-1/8	1-11/16	2-5/16	1-11/16	2-7/8	2-11/16	3	3-1/2	6	11/16
2	2-1/2	2	3-11/16	2	2-11/16	1-13/16	3-5/8	3-3/16	4	6	8	3/4
2-1/2	2-15/16	2-1/4	4-1/2			2-1/8	4-1/8	3-11/16				15/16
3	3-3/8	2-1/2	5-1/8			2-1/4	4-1/8	4-1/16				1

NOTE: Dimensions are in inches.

TABLE B-5.6



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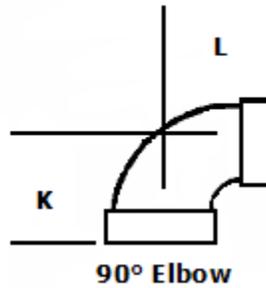
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APPENDIX C



50-LB. MALLEABLE IRON FITTING DIM. 90° ELBOWS (Standard Weight)			
Size AxB		K	L
1/4x	1/8	3/4	3/4
3/8x	1/4	7/8	7/8
	1/8	13/16	
1/2x	3/8	1-1/16	1-1/16
	1/4		
3/4x	1/2	1-3/16	1-1/4
	3/8	1-1/8	1-1/8
	1/4	1-1/8	1-1/8
1x	3/4	1-5/16	1-3/8
	1/2	1-1/4	1-5/16
	3/8	1-1/4	1-5/16
1-1/4x	1	1-9/16	1-5/8
	3/4	1-7/16	
	1/2	1-7/16	
1-1/2x	1-1/4	1-13/16	1-13/16
	1	1-13/16	1-7/8
	3/4	1-11/16	1-13/16
2x	1-1/2	2	2-1/8
	1-1/4	1-15/16	2-1/16
	1	1-15/16	2-1/16
	3/4	1-5/8	2
2-1/2x	2	2-3/8	2-5/8
	1-1/2		
3x	2-1/2	2-13/16	3
	2	2-1/2	2-7/8
4x	3	3-5/16	3-5/8

NOTE: Dimensions are in inches.

TABLE B-5.7



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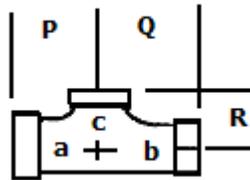
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APPENDIX D



150-LB. MALLEABLE IRON FITTING DIMENSIONS					
Reducing Tees					
Size AxBxC			P	Q	R
1/4x	1/4x	1/8 3/8	3/4 7/8	3/4 7/8	3/4 7/8
1/8x	1/8x	1/4	3/4	3/4	3/4
3/8x	3/8x	1/4 1/2	7/8 1-1/16	7/8 1-1/16	7/8 1-1/16
3/8x	1/4x	3/8 1/4	15/16 7/8	7/8 13/16	15/16 7/8
1/2x	1/2x	1 3/8 3/4 1/4	1-3/8 1-1/16 1-1/4 1	1-3/8 1-1/16 1-1/4 1	1-5/16 1-1/16 1-3/16 1-1/16
1/2x	3/8x	1/2 3/8	1-1/8 1-1/16	1-1/16 1-15/16	1-1/18 1-1/16
1/2x	1/4x	1/2	1-1/8	1-1/16	1-1/8
3/4x	3/4x	1-1/4 1 1/2 3/8 1/4	1-5/8 1-3/8 1-3/16 1-1/8 1-1/16	1-5/8 1-3/8 1-3/16 1-1/8 1-1/16	1-9/16 1-5/16 1-1/4 1-3/16 1-3/16
3/4x	1/2x	3/4 1/2	1-5/16 1-3/16	1-1/4 1-1/8	1-5/16 1-1/4
3/4x	3/8x	3/4 3/8	1-5/16 1-1/8	1-3/16 1-1/16	1-5/26 1-3/16
3/4x	1/4x	3/4	1-3/16	1-1/16	1-3/16
1x	1x	2 1-1/2 1-1/4 3/4 1/2 3/8 1/4	2-1/8 1-3/4 1-5/8 1-5/16 1-1/4 1-3/16 1-3/16	2-1/8 1-3/4 1-5/8 1-5/16 1-1/4 1-3/16 1-3/16	2 1-5/8 1-9/16 1-3/8 1-5/16 1-5/16 1-5/16
1x	3/4x	1 3/4 1/2	1-7/16 1-5/16 1-1/4	1-3/8 1-5/16 1-3/16	1-7/16 1-3/8 1-5/16
1x	1/2x	1 3/4 1/2	1-7/16 1-5/16 1-1/4	1-5/16 1-1/4 1-1/8	1-7/16 1-3/8 1-5/16

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TABLE B-5.8



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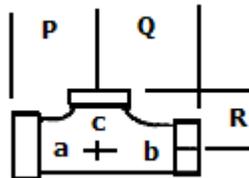
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APPENDIX E



150-LB MALLEABLE IRON FITTING DIMENSIONS					
Reducing Tees					
Size		C	P	Q	R
Ax	Bx				
1-1/4x	1-1/4x	2	2-1/8	2-1/8	2
		1-1/2	1-13/16	1-13/16	1-3/4
		1	1-9/16	1-9/16	1-5/8
		3/4	1-7/16	1-7/16	1-9/16
		1/2	1-5/16	1-5/16	1-1/2
1-1/4x	1x	3/8	1-1/4	1-1/4	1-1/2
		1-1/4	1-3/4	1-5/8	1-3/4
		1	1-9/16	1-7/16	1-5/8
		3/4	1-7/16	1-5/16	1-9/16
1-1/4x	3/4x	1/2	1-7/16	1-5/16	1-9/16
		1-1/4	1-11/16	1-9/16	1-11/16
		1	1-9/16	1-3/8	1-5/8
1-1/2x	1-1/2x	2	2-1/8	2-1/8	2
		1-1/4	1-13/16	1-13/16	1-13/16
		1	1-5/8	1-5/8	1-3/4
		3/4	1-1/2	1-1/2	1-11/16
1-1/2x	1-1/4x	1/2	1-3/8	1-3/8	1-5/8
		1-1/2	1-5/16	1-13/16	1-15/16
		1-1/4	1-3/4	1-11/16	1-13/16
		1	1-5/8	1-8/16	1-3/4
1-1/2x	1x	3/4	1-5/8	1-9/16	1-3/4
		1/2	1-5/8	1-9/16	1-3/4
		1-1/2	1-7/8	1-3/4	1-7/8
		1-1/4	1-3/4	1-11/16	1-13/16
1-1/2x	3/4x	1	1-5/8	1-7/16	1-3/4
		1-1/2	1-7/8	1-11/16	1-7/8
		1/2x	1-1/2	1-11/16	1-7/8

NOTE: Dimensions are in inches.

TABLE B-5.9



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APPENDIX F

150-LB MALLEABLE IRON FITTING DIMENSIONS					
Reducing Tees					
Size		C	P	Q	R
Ax	Bx				
2x	2x	2-1/2	2-1/2	2-1/2	2-7/16
		1-1/2	2	2	2-1/8
		1-1/4	1-15/16	1-15/16	2-1/16
		1	1-3/4	1-3/4	2
		3/4	1-5/8	1-5/8	1-15/16
		1/2	1-1/2	1-1/2	1-7/8
2x	1-1/2x	2	2-1/4	2-1/8	2-1/4
		1-1/2	2	1-15/16	2-1/8
		1-1/4	1-15/16	1-3/4	2-1/16
		1	1-15/16	1-3/4	1-1/16
2x	1-1/4x	2	2-1/4	2-1/8	2-14
		1-12	2	1-5/16	2-18
		1-14	1-15/16	1-3/4	2-1/16
2x	1x	2	2-1/4	2-1/16	2-1/4
2x	3/4x 1-1/2x	2	2-1/4	1-15/16	2-1/4
		3	3	3	2-13/16
2-1/2x	2-1/2x	2	2-7/16	2-7/16	2-1/2
		1-1/2	2-3/16	2-3/16	2-1/2
		1-1/4	2-1/16	2-1/16	2-7/16
		1	1-7/8	1-7/8	2-3/8
		3/4	1-13/16	1-13/16	2-3/16
		2-1/2x	2x	2-1/2	2-11/16
2-1/2x	1-1/2xs	2	2-1/2	2-1/4	2-9/16
		2-1/2	2-11/16	2-7/16	2-11/16
3x	3x	2	2-1/2	2-1/8	2-11/16
		2	2-1/2	2-1/8	2-9/16
		1-1/2	2-13/16	2-13/16	3-1/16
		1-1/4	2-9/16	2-9/16	2-15/16
		1	2-5/16	2-5/16	2-3/4
		3/4	2-1/4	2-1/4	2-3/4
3x	2-12x	1	2-1/16	2-1/16	2-5/8
		3/4	1-15/16	1-15/16	2-9/16
		2-1/2	2-3/4	2-11/16	3
		2	2-9/16	2-1/2	2-15/16
		3	3-1/8	2-15/16	3-1/8
3x	2x	2	2-9/16	2-14	2-15/16
		3	3-3/8	3-3/8	3-3/4
		3-1/2	2-15/16	2-15/16	3-5/8
		2	2-7/8	2-7/8	3-5/8
4x	4x	1-1/2	2-7/8	2-7/8	3-5/8
		4	3-3/4	3-11/16	3-3/4

NOTE: Dimensions are in inches

TABLE B-5.10



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

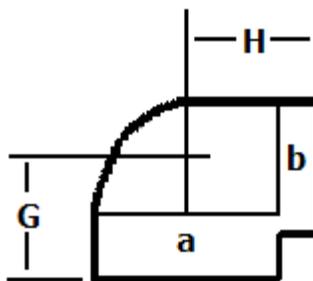
Approved By: Jerome T. Schmitz 

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX G



90° Elbow

300-LB. MALLEABLE IRON FITTING DIMENSIONS REDUCING 90° ELBOWS (Extra Heavy)		
Size AxB	G	H
3/8x1/4	1-1/16	1-1/16
1/2x3/8	1-3/16	1-3/16
3/4x1/2 3/4x3/8	1-5/16	1-3/8
1x3/4 1x1/2	1-1/2	1-9/16
1-1/4x1 1-1/4x3/4	1-3/4	1-13/16
1-1/2x1-1/4 1-1/2x1	2	2-1/16
2x1-1/2 2x1-1/4	2-1/4	2-3/8
2-1/2x2	2-11/16	2-3/4
3x2-1/2	3-1/16	3-5/16

NOTE: Dimensions are in inches.

TABLE B-5.11



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

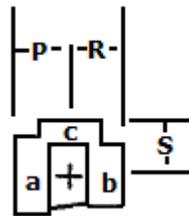
Approved By: Jerome T. Schmitz

Section No: MS B-5
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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX H



150-LB MALLEABLE IRON FITTING DIMENSIONS					
Reducing Tees					
Ax	Size		P	R	S
	Bx	C			
3/8x	3/8x	1/4	1-1/16	1-1/16	1-1/16
1/2x	1/2x	3/8 1/4	1-3/16	1-3/16	1-3/16
1/2x	3/8x	1/2	1-1/4	1-3/16	1-1/4
3/4x	3/4x	1	1-9/16	1-9/16	1-1/2
3/4x	3/4x	1/2 3/8 1/4	1-5/16	1-5/16	1-3/8
3/4x	1/2x	3/4 1/2	1-7/16 1-5/16	1-3/8 5/16	1-7/16 1-3/8
1/2x	1/2x	3/4	1-3/8	1-3/8	1-5/16
1x	1x	3/4	1-1/2	1-1/2	1-9/16
		1/2	1-7/16	1-7/16	1-1/2
		3/8	1-5/16	1-5/16	1-7/16
		1/4	1-5/16	1-5/16	1-7/16
1x	3/4x	1 3/4	1-5/8 1-1/2	1-9/16 1-7/16	1-5/8 1-9/16
1x	1/2x	1	1-5/8	1-9/16	1-5/8
1-1/4x	1-1/4x	1	1-3/4	1-3/4	1-13/16
		3/4	1-5/8	1-5/8	1-3/4
		1/2	1-1/2	1-1/2	1-11/16
		3/8	1-3/4	1-3/4	1-13/16
1-1/4x	3/4x	1-1/4	1-15/16	1-3/4	1-15/16
1-1/2x	1-1/2x	1-1/4	2-1/4	2-1/4	2-3/8
		1	2-1/8	2-1/8	2-5/16
		3/4	2	2	2-1/4
		1/2	1-13/16	1-13/16	2-1/8
			1-3/4	1-3/4	2-1/16
2x	1-1/2x	2	2-1/2	2-1/16	2-1/2
2-1/2x	2x	2-1/2	2-15/16	2-3/4	2-15/16
3x	3x	2-1/2	3-1/16	3-1/16	3-5/16
		2	2-13/16	2-13/16	3-1/8
		1-1/2	2-13/16	2-13/16	3-1/8

NOTE: Dimensions are in inches.

TABLE B-5.12



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff *[Signature]*

Approved By: Jerome T. Schmitz *[Signature]*

Section No: MS B-5
 Page No.: 15 of 23
 Issue Date: 02/05/19
 Superseded Date: 06/20/18

PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX I

FACE BUSHINGS							
Size	Length of External Thread (Min) A	Length of Internal Thread (Minimum) T	Height of Head (Minimum) D	Width of Head (Minimum)		Nominal Metal Thickness G	
				Outside C	Inside C		
1/4x	1/8	0.44	0.26	0.14	0.64*	—	
3/8x	1/4	0.48	0.40	0.16	0.68*	—	
	1/8		0.25				
1/2	3/8	0.56	0.41	0.19	0.87*	—	
	1/4		0.32				
	1/8		0.25				
3/4x	1/2	0.63	0.53	0.22	1.15*	—	
	3/8		0.36				
	1/4		0.32				
	1/8		0.25				
1x	3/4	0.75	0.50	0.25	1.42*	—	
	1/2		0.43				
	3/8		0.36				
	1/4		0.32				
	1/8		0.25				
1-1/4x	1	0.80	0.58	0.28	1.76	—	
	3/4		0.50				
	1/2		0.43				
	3/8		0.36				
	1/4		0.32				
1-1/2x	1-1/4	0.83	0.71	0.31	2.00	—	
	1		0.58				
	3/4		0.50				
	1/2		0.43				
	3/8		0.36				
	1/4		0.32				
2x	1-1/2	0.88	0.70	0.34	2.48	—	
	1-1/4		0.67				
	1		0.58				
	3/4		0.50				
	1/2		0.43				
	3/8		0.36				
	1/4		0.32				
2-1/2x	2	1.07	0.75	0.37	2.98	—	
	1-1/2		0.70				
	1-1/4		0.67				
	1		0.58				
	3/4		0.50				
	1/2		0.43				

NOTE: When made of bar stock, the dimensions may be 5/8, 11/16, 7/8, 1-1/8 and 1-7/16 inches, in order to use regular bar stock sizes. Dimensions are in inches.

TABLE B-5.13



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

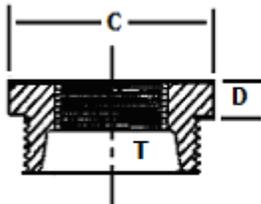
Section No: MS B-5
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 Superseded Date: 06/20/18

PIPE FITTINGS

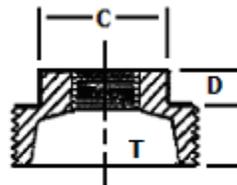
Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX I

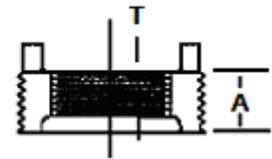
(Cont'd)



Outside Hex Head
(Class 150)



Inside Hex Head
(Class 150)



Face Bushing
(Class 300)

FACE BUSHINGS							
Size	Length of External Thread (Min) A	Length of Internal Thread (Minimum) T	Height of Head (Minimum) D	Width of Head (Minimum)		Nominal Metal Thickness G	
				Outside C	Inside C		
3x	2-1/2	1.13	0.92	0.40	3.86	—	—
	2		0.75	0.48	3.28	—	—
	1-1/2		0.70	0.48	—	2.68	0.260
	1-1/4		0.67	0.48	—	2.39	0.260
	1		0.58	0.48	—	1.95	0.260
	3/4		0.50	0.48	—	1.63	0.260
3-1/2x	1/2	0.43	0.48	—	1.34	0.260	
	3	1.18	0.98	0.43	4.62	—	—
	2-1/2		0.92	0.52	3.86	—	—
	2		0.75	0.52	—	3.28	0.280
	1-1/2		0.70	0.52	—	2.68	0.280
	1-1/4		0.67	0.52	—	2.39	0.280
1	0.58		0.52	—	1.95	0.280	
4x	3-1/2	1.22	1.03	0.50	5.20	—	—
	3		0.98	0.50	4.62	—	—
	2-1/2		0.92	0.60	—	3.86	0.310
	2		0.75	0.60	—	3.28	0.310
	1-1/2		0.70	0.60	—	2.68	0.310
	1-1/4		0.67	0.60	—	2.39	0.310
1	0.58	0.60	—	1.95	0.310		

NOTE: Dimensions are in inches.

TABLE B-5.14



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

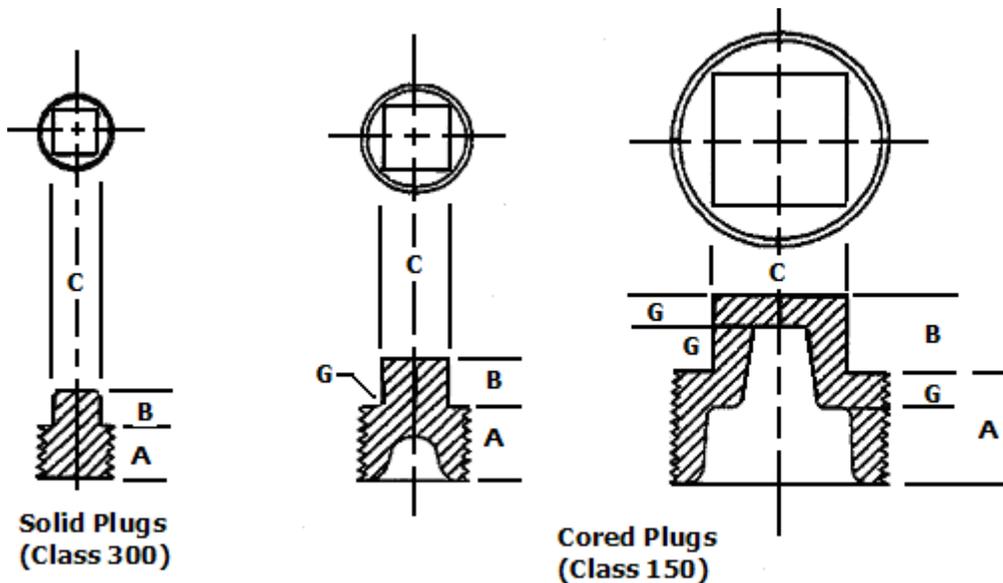
Approved By: Jerome T. Schmitz

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX J



PLUGS					
Nominal Pipe Size	Thread Length (Minimum) A	Height of Square (Minimum) B	Width Across Flats (Minimum)		Nominal Metal Thickness G
			Nominal C	Maximum C	
1/8	0.37	0.24	9/32	0.281	—
1/4	0.44	0.28	3/8	0.375	—
3/8	0.48	0.31	7/16	0.438	—
1/2	0.56	0.38	9/16	0.563	0.16
3/4	0.63	0.44	5/8	0.625	0.18
1	0.75	0.50	13/16	0.813	0.20
1-1/4	0.80	0.56	15/16	0.938	0.22
1-1/2	0.83	0.62	1-1/8	1.125	0.24
2	0.88	0.68	1-5/16	1.313	0.26
2-1/2	1.07	0.74	1-1/2	1.500	0.29
3	1.13	0.80	1-11/16	1.688	0.31
3-1/2	1.18	0.86	1-7/8	1.875	0.34

NOTE: Dimensions are in inches.

TABLE B-5.15



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

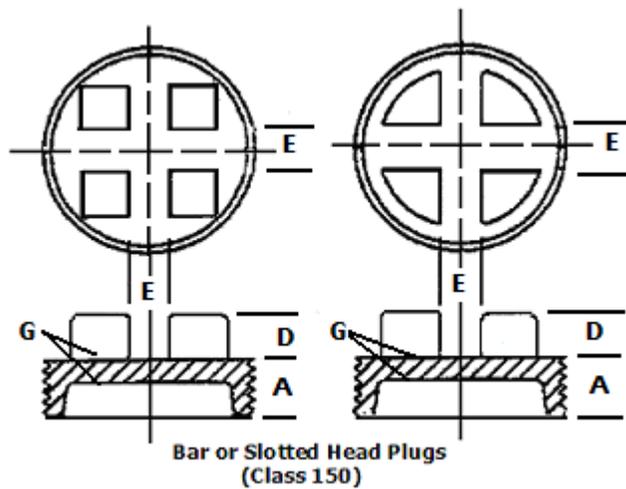
Approved By: Jerome T. Schmitz

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX K



PLUGS				
Nominal Pipe Size	Thread Length (Minimum) A	Height of Lug (Minimum) D	Distance Between Lugs (Minimum) E	Metal Thickness G
4	1.22	1.00	0.88	0.37

NOTES: Dimensions are in inches.

TABLE B-5.16



MATERIAL SPECIFICATION

Prepared By: Engineering Staff

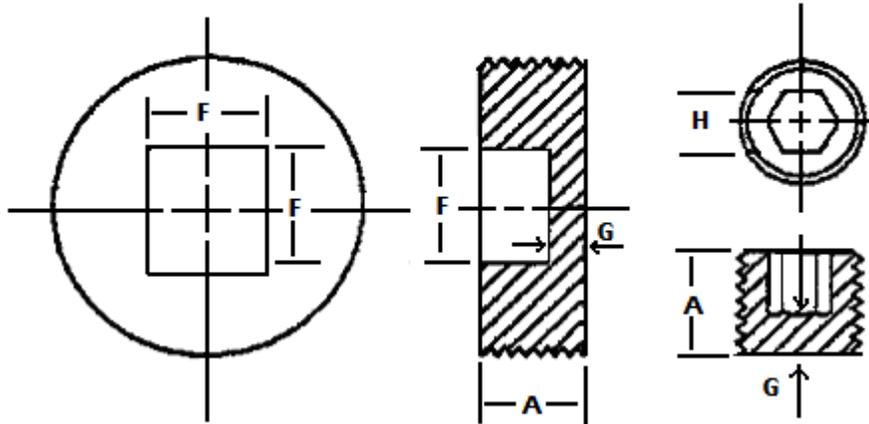
Approved By: Jerome T. Schmitz

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

APPENDIX L



CLASS 150 COUNTERSUNK PLUGS					
Nominal Pipe Size	Thread Length (Minimum) A	Size of Square Socket [1]		Size of Hexagon [2] H	Metal Thickness [3] G
		Nominal F	Maximum F		
1/8	0.37	—	—	3/16	0.06
1/4	0.44	—	—	1/4	0.09
3/8	0.48	—	—	5/16	0.13
1/2	0.56	3/8	0.382	3/8	0.16
3/4	0.63	1/2	0.508	9/16	0.18
1	0.75	1/2	0.508	5/8	0.20
1-1/4	0.80	3/4	0.759	—	0.22
1-1/2	0.83	3/4	0.759	—	0.24
2	0.88	7/8	0.884	—	0.26
2-1/2	1.07	1-1/8	1.137	—	0.29
3	1.13	1-3/8	1.391	—	0.31
3-1/2	1.18	1-1/2	1.518	—	0.34
4	1.22	2	2.022	—	0.37

NOTES:

- [1] Material to be cast iron, malleable iron or steel.
- [2] Square socket of countersunk pattern to have dimensions to fit commercial square bars of sizes indicated.
- [3] Hexagon socket of countersunk pattern shall have dimensions to fit regular wrenches used with hexagon socket set screws.
- [4] For metal thickness tolerance, see Paragraph 6.1.
- [5] Dimensions are in inches

TABLE B-5.17



SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS B-5
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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

7. INSPECTION

- 7.1 Successful review of the Product Information Package (PIP), as well as any future reference by SWG 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 manufacture and testing of the items described in this specification that are sold to Southwest.
- 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 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 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 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.**
- 7.5 Suppliers of fittings will perform an inspection of the product prior to coating or any other modification to ensure that the fittings meet all requirements of this specification and the purchase order prior to coating or modification, including but not limited to, marking, dimensional specifications, dimensional tolerances and thread quality.

8. CERTIFICATION

The manufacturer's or supplier's certification will be furnished to Southwest. This certification will 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 

Approved By: Jerome T. Schmitz 

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

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 Each Class 150 fitting will be marked with the manufacturer's name or trademark.
- 10.2 Each Class 300 fitting will be marked with the following as a minimum:
 - Manufacturer's Name or Trademark
 - Numerals "300"
 - Letters "MI" to designate malleable iron
 - Size
- 10.3 Each plug will be marked with the manufacturer's name or trademark, except where marking is impractical.
- 10.4 Markings as required above on the fittings need only be legible prior to coating by the supplier or Southwest.

11. PACKAGING AND PACKAGE MARKING

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



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

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PIPE FITTINGS

Fittings, Malleable Iron, ANSI Classes 150 & 300

12. STOCK CLASSIFICATION DESCRIPTION

_____ (ELBOW, TEE, CROSS, Y-BRANCH, COUPLING, PLUG, BUSHINGS, CAP), ____ (45°, 90°), _____ (STRAIGHT, REDUCING, STREET), GRAY COATED, MALLEABLE, _____ (SIZE), STANDARD WALL THICKNESS, _____ (150, 300) LB. CLASS, ANSI B-16.3, TAPERED THREADS.