



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS A-1
Page No.:	1 of 17
Issue Date:	09/27/22
Superseded Date:	02/27/20

PIPE AND TUBING

Pipe, Line, API Specification 5L

1. SCOPE

This specification covers API Specification 5L, Grades B, X-42, X-46, X-52 and X-65-line pipe in outside diameters of 2-inch nominal through 30 inches nominal. All pipe covered by this specification must be tested in accordance with the Company's Operations Manual, Pipe and Component Testing Design.

2. APPLICABLE DOCUMENTS

- 2.1 American Petroleum Institute (API) "Recommended Practice 5L, (45th Edition, Dec. 2012), "Specification for Line Pipe."
- 2.2 American Petroleum Institute (API) "Recommended Practice 5L1, (7th Edition, Sept. 2009), "Recommended Practice for Railroad Transportation of Line Pipe."
- 2.3 American Petroleum Institute (API) "Recommended Practice 5LT, (First Edition, March 2012), "Recommended Practice for Truck Transportation of Line Pipe."
- 2.4 American Petroleum Institute (API) "Recommended Practice 5LW, (3rd Edition, Sept. 2009), "Transportation of Line Pipe on Barges and Marine Vessels."
- 2.5 Title 49, Code of Federal Regulations, Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards" (49 CFR 192).
- 2.6 American Petroleum Institute (API) "Recommended Practice 5MT, (1st Edition, September 2021). "Pipeline Material Traceability and electronic MTR Inspection Documents".

NOTE: Unless otherwise specified, the editions of the document incorporated in whole or 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.



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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 "approve," "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.

4. MATERIAL AND MANUFACTURING

- 4.1 Pipe purchased under this specification will be manufactured, as a minimum, in accordance with API Specification 5L Performance Service Level (PSL) 1 or (PSL) 2 and additional requirements as defined in this qualification.
- 4.2 PSL 1 shall require staff approval.
- 4.3 Cold-expanded pipe is not acceptable.
- 4.4 Jointers are not permitted.
- 4.5 All pipe will be beveled to an angle of 30° with a tolerance of +5°, -0°. The bevel will be measured from a line drawn perpendicular to the axis of the pipe with a root face of 1/16 inch, ± 1/32 inch.
- 4.6 The pipe will be visually examined and will be free of defects as defined in API Specification 5L in the finished condition. This includes, but not limited to, cracks, dents, inclusions or electric-weld flash, both internal and external. The pipe surface will be free from scale and injurious defects.
- 4.7 The maximum carbon equivalency (CE) value will be 0.43%. The International Institute of Welding (IIW) formula found in API 5L will be used to determine the CE.



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5. PERFORMANCE REQUIREMENTS

- 5.1 The minimum testing required by API Specification 5L for the Grade and Delivery Condition shall be performed and successfully completed.
- 5.2 Southwest Gas reserves the right to require any supplementary requirements listed in the API Specification 5L when specified on the purchase order.

6. DIMENSIONS AND TOLERANCES

Pipe diameter, wall thickness, dimensions and tolerances will be held to API Specification 5L values.

Unless a minimum or maximum length is specified on the materials requisition and purchase order, the following tolerances in length shall apply:

Nominal Length (Feet)	Minimum Length (Feet)	Minimum Average Lengths Of Each Order Item (Feet)	Maximum Length (Feet)
20 (SRL)	9.0	17.5	22.5
40 (DRL)	14.0	35.0	45.0
60 (TRL)	21.0	52.5	65.0
80	28.0	70.0	85.0

TABLE A-4.1

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 Southwest retains the option to inspect the manufacture and testing of all materials, products or systems referenced in this specification that are sold to Southwest.



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7. INSPECTION (Cont'd)

- 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 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.**

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.

Testing documentation demonstrating the physical characteristics of the pipe which includes, 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, Electronic Material Test Reports (MTR's) shall also be provided in accordance with the API RP 5MT. Data Interchange method and Data Model shall be agreed to by Southwest prior to purchase. If special software or access is required to view and copy the electronic MTR, the manufacturer shall provide free of charge to Southwest and our Distributor. The certification of an independent third-party indicating conformance to this specification may be considered at Southwest's expense.



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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-530
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

Pipe manufactured to this specification will be marked with the following:

- Manufacturer's Name or Mark
- API Specification 5L
- Heat Code
- Pipe Number (or Z Number for smaller diameter batched pipe)
- Nominal Size
- Weight Per Foot
- Grade
- Deliver Condition; e.g. M-Thermomechanical rolled or formed
- Product Specification Level
- Southwest Purchase Order Number
- Process of Manufacture as defined in API 5L
- Examples: SMLS (Seamless Pipe)
HFW High Frequency Welded



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11. PACKAGING AND PACKAGE MARKING

If pipe is delivered via railroad, delivery will meet or exceed the requirements of API Recommended Practice 5L1. All products covered in this specification will be packaged in a manner to prevent damage during transportation and storage.

12. STOCK CLASSIFICATION DESCRIPTION

PIPE, API 5L GRADE _____; _____ (SEAMLESS, ERW, SAW); _____ INCH OD X WT; _____ (SRL, DRL, TRL); ENDS BEVELED FOR WELDING 30°, +5, -0; MAX LENGTH _____ FT, MIN LENGTH _____ FT. (OPTIONAL).

13. LOADING AND TRANSPORTATION

Loaded and Transported pipe shall meet the current applicable specification in CFR 192; Truck; API Recommended Practice 5LT, Recommended Practice for Truck Transportation of Line Pipe.

Rail: API Recommended Practice 5L1, Recommended Practice for Railroad Transportation of Line Pipe.

Barge: API Recommended Practice 5LW, Recommended Practice for Transportation of Line Pipe on Barges and Marine Vessels.



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APPENDIX A

GRADE B (Measurements in Inches) (Based on SMYS=35000 psig`)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure AT 20% SMYS	Design Pressure (psig) CLASS LOCATIONS			
							1	2	3	4
2"	2.375	STD	0.154	3.66	4539	908	3268	2723	2269	1815
	2.375	XS	0.218	5.03	6425	1285	4626	3855	3212	2570
3"	3.500	STD	0.156	5.58	3120	624	2246	1872	1560	1248
	3.500		0.188	6.66	3760	752	2707	2256	1880	1504
	3.500		0.216	7.58	4320	864	3110	2592	2160	1728
	3.500		0.300	10.26	6000	1200	4320	3600	3000	2400
4"	4.500	STD	0.156	7.24	2427	485	1747	1456	1213	970
	4.500		0.188	8.67	2924	585	2105	1754	1462	1169
	4.500		0.237	10.79	3687	737	2654	2212	1843	1474
	4.500		0.337	14.98	5242	1048	3774	3145	2621	2096
6"	6.625	STD	0.156	10.79	1648	330	1186	988	824	659
	6.625		0.188	12.94	1986	397	1430	1191	993	794
	6.625		0.219	15.00	2314	463	1666	1388	1156	925
	6.625		0.250	17.04	2642	528	1901	1584	1320	1056
	6.625		0.280	18.99	2958	592	2130	1775	1479	1183
	6.625		0.432	28.60	4565	913	3286	2738	2282	1825
8"	8.625	STD	0.188	16.96	1526	305	1098	915	762	610
	8.625		0.219	19.68	1777	355	1279	1066	888	710
	8.625		0.250	22.38	2029	406	1460	1217	1014	811
	8.625		0.277	24.72	2248	450	1618	1348	1124	899
	8.625		0.322	28.58	2613	523	1881	1568	1306	1045
	8.625		0.500	43.43	4058	812	2921	2434	2028	1623
10"	10.750	STD	0.188	21.23	1224	245	881	734	612	489
	10.750		0.219	24.65	1426	285	1026	855	713	570
	10.750		0.250	28.06	1628	326	1172	976	813	651
	10.750		0.279	31.23	1817	363	1308	1090	908	726
	10.750		0.365	40.52	2377	475	1711	1426	1188	950
	10.750		0.500	54.79	3256	651	2344	1953	1627	1302

*STD = Standard
 *XS = Extra Strong

TABLE A-1.2



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APPENDIX A

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GRADE B (Cont'd) (Measurements in Inches) (Based on SMYS = 35000 psig)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS			
							1	2	3	4
12"	12.750	STD XS	0.219	29.34	1202	240	865	721	601	480
	12.750		0.250	33.41	1373	275	988	823	686	549
	12.750		0.281	37.46	1543	309	1110	925	771	617
	12.750		0.312	41.48	1713	343	1233	1027	856	685
	12.750		0.375	49.61	2059	412	1482	1235	1029	823
	12.750		0.500	65.48	2745	549	1976	1647	1372	1098
16"	16.000	STD XS	0.219	36.95	958	192	689	574	479	383
	16.000		0.250	42.09	1094	219	787	656	546	437
	16.000		0.312	52.32	1365	273	982	819	682	546
	16.000		0.344	57.57	1505	301	1083	903	752	602
	16.000		0.375	62.64	1641	328	1181	984	820	656
	16.000		0.500	82.85	2188	438	1575	1312	1093	875
20"	20.000	STD XS	0.250	52.78	875	175	630	525	437	350
	20.000		0.281	59.23	984	197	708	590	491	393
	20.000		0.312	65.66	1092	218	786	655	546	436
	20.000		0.344	72.28	1204	241	866	722	602	481
	20.000		0.375	78.67	1313	263	945	787	656	525
	20.000		0.500	104.23	1750	350	1260	1050	875	700

* STD = Standard
 * XS = Extra Strong

TABLE A-1.2

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APPENDIX B

GRADE X-42 (Measurements in Inches) (Based on SMYS = 42000 psig)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS			
							1	2	3	4
4"	4.500	STD	0.156	7.24	2912	582	2096	1747	1456	1164
	4.500		0.188	8.67	3509	702	2526	2105	1754	1403
	4.500		0.237	10.79	4424	885	3185	2654	2212	1769
	4.500		XS	0.337	14.98	6291	1258	4529	3774	3145
6"	6.625	STD	0.156	10.79	1978	396	1424	1186	988	791
	6.625		0.188	12.94	2384	477	1716	1430	1191	953
	6.625		0.219	15.00	2777	555	1999	1666	1388	1110
	6.625		0.250	17.04	3170	634	2282	1901	1584	1267
	6.625		0.280	18.99	3550	710	2556	2130	1775	1420
	6.625		XS	0.432	28.60	5477	1095	3943	3286	2738
8"	8.625	STD	0.188	16.96	1831	366	1318	1098	915	732
	8.625		0.219	19.68	2133	427	1535	1279	1066	853
	8.625		0.250	22.38	2435	487	1753	1460	1217	973
	8.625		0.277	24.72	2698	540	1942	1618	1348	1079
	8.625		0.322	28.58	3136	627	2257	1881	1568	1254
	8.625		XS	0.500	43.33	4870	974	3506	2921	2434
10"	10.750	STD	0.188	21.23	1469	294	1057	881	734	587
	10.750		0.219	24.65	1711	342	1232	1026	855	684
	10.750		0.250	28.06	1953	391	1406	1172	976	781
	10.750		0.279	31.23	2180	436	1569	1308	1090	872
	10.750		0.365	40.52	2852	570	2053	1711	1426	1140
	10.750		XS	0.500	54.79	3907	781	2813	2344	1953
12"	12.750	STD	0.219	29.34	1443	289	1038	865	721	577
	12.750		0.250	33.41	1647	329	1185	988	823	658
	12.750		0.281	37.46	1851	370	1332	1110	925	740
	12.750		0.312	41.48	2056	411	1479	1233	1027	822
	12.750		0.375	49.61	2471	494	1778	1482	1235	988
	12.750		XS	0.500	65.48	3294	659	2371	1976	1647

* STD = Standard
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TABLE A-1.4

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APPENDIX B

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GRADE X-42 (Cont'd) (Measurements in Inches) (Based on SMYS = 42000 psig)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS			
							1	2	3	4
16"	16.000	STD	0.219	36.95	1150	230	827	689	574	459
	16.000		0.250	42.09	1313	263	945	787	656	525
	16.000		0.312	52.32	1638	328	1179	982	819	655
	16.000		0.344	57.57	1806	361	1300	1083	903	722
	16.000		0.375	62.64	1969	394	1417	1181	984	787
	16.000		0.438	72.86	2300	460	1655	1379	1149	919
20"	20.000	STD	0.281	59.23	984	197	708	590	491	393
	20.000		0.312	65.66	1092	218	786	655	546	436
	20.000		0.344	72.28	1204	241	866	722	602	481
	20.000		0.375	78.67	1313	263	945	787	656	525
	20.000		0.438	91.59	1533	307	1103	919	766	613
	20.000		0.500	104.23	1750	350	1260	1050	875	700
30"	30.000	STD	0.312	98.02	874	175	628	524	436	349
	30.000		0.344	109.06	963	193	693	577	481	385
	30.000		0.375	118.76	1050	210	756	630	525	420
	30.000		0.438	138.42	1226	245	883	735	613	490
	30.000		0.500	157.68	1400	280	1008	840	700	560
	30.000		0.688	215.58	1926	385	1387	1155	963	770

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APPENDIX C

GRADE X-46 (Measurements in Inches) (Based on SMYS = 46000 psig)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS			
							1	2	3	4
4"	4.500	STD	0.156	7.24	3189	638	2296	1913	1594	1275
	4.500		0.188	8.67	3844	769	2767	2306	1921	1537
	4.500		0.237	10.79	4845	969	3488	2907	2422	1938
	4.500		0.337	14.98	6890	1378	4960	4133	3444	2755
6"	6.625	STD	0.156	10.79	2166	433	1559	1299	1083	866
	6.625		0.188	12.94	2611	522	1879	1566	1305	1044
	6.625		0.219	15.00	3041	608	2189	1824	1520	1216
	6.625		0.250	17.04	3472	694	2499	2083	1735	1388
	6.625		0.280	18.99	3888	778	2799	2332	1944	1555
	6.625		0.432	28.60	5999	1200	4319	3599	2999	2399
8"	8.625	STD	0.188	16.96	2005	401	1443	1203	1002	802
	8.625		0.219	19.68	2336	467	1681	1401	1168	934
	8.625		0.250	22.38	2667	533	1920	1600	1333	1066
	8.625		0.277	24.72	2955	591	2127	1772	1477	1181
	8.625		0.322	28.58	3435	687	2472	2060	1717	1373
	8.625		0.500	43.33	5333	1067	3840	3200	2666	2133
10"	10.750	STD	0.188	21.23	1609	322	1158	965	804	643
	10.750		0.219	24.65	1874	375	1349	1124	937	749
	10.750		0.250	28.06	2140	428	1540	1283	1069	855
	10.750		0.279	31.23	2388	478	1719	1432	1193	955
	10.750		0.365	40.52	3124	625	2249	1874	1561	1249
	10.750		0.500	54.79	4279	856	3080	2567	2139	1711
12"	12.750	STD	0.219	29.34	1580	316	1137	948	790	632
	12.750		0.250	33.41	1804	361	1298	1082	901	721
	12.750		0.281	37.46	2028	406	1459	1216	1013	811
	12.750		0.312	41.48	2251	450	1620	1350	1125	900
	12.750		0.375	49.61	2706	541	1948	1623	1352	1082
	12.750		0.500	65.48	3608	722	2597	2164	1803	1443

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GRADE X-46 (Cont'd) (Measurements in Inches) (Based on SMYS = 46000 psig)											
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS				
							1	2	3	4	
16"	16.000	STD	0.219	36.95	1259	252	906	755	629	503	
	16.000		0.250	42.09	1438	288	1035	862	718	575	
	16.000		0.312	52.32	1794	359	1291	1076	897	717	
	16.000		0.344	57.57	1978	396	1424	1186	989	791	
	16.000		0.375	62.64	2156	431	1552	1293	1078	862	
	16.000		0.438	72.86	2519	504	1813	1511	1259	1007	
	16.000		XS	0.500	82.85	2875	575	2070	1725	1437	1150
20"	20.000	STD	0.250	52.78	1150	230	828	690	575	460	
	20.000		0.281	59.23	1293	259	930	775	646	517	
	20.000		0.312	65.66	1435	287	1033	861	717	574	
	20.000		0.344	72.28	1582	316	1139	949	791	632	
	20.000		0.375	78.67	1725	345	1242	1035	862	690	
	20.000		0.438	91.59	2015	403	1450	1208	1007	805	
	20.000		XS	0.500	104.23	2300	460	1656	1380	1150	920
24"	24.000	STD	0.281	71.25	1077	215	775	646	538	430	
	24.000		0.312	79.01	1196	239	861	717	598	478	
	24.000		0.344	86.99	1319	264	949	791	659	527	
	24.000		0.375	94.71	1438	288	1035	862	718	575	
	24.000		0.438	110.32	1679	336	1208	1007	839	671	
	24.000		XS	0.500	125.61	1917	383	1380	1150	958	766
	24.000		0.688	171.45	2637	527	1898	1582	1318	1054	
30"	30.000	STD	0.312	99.02	957	191	688	574	478	382	
	30.000		0.344	109.06	1055	211	759	632	527	421	
	30.000		0.375	118.76	1150	230	828	690	575	460	
	30.000		0.438	138.42	1343	269	967	805	671	537	
	30.000		XS	0.500	157.68	1533	307	1104	920	766	613
	30.000		0.688	215.58	2110	422	1519	1265	1054	843	

* STD = Standard
* XS = Extra Strong

TABLE A-1.5

(Cont'd)

**SOUTHWEST GAS CORPORATION**

® ENGINEERING STAFF

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

Section No:	MS A-1
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PIPE AND TUBING

Pipe, Line, API Specification 5L

APPENDIX D

GRADE X-52											
(Measurements in Inches)											
(Based on SMYS = 52000 psig)											
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS				
							1	2	3	4	
4"	4.500	STD	0.156	7.24	3605	721	2595	2163	1802	1442	
	4.500		0.188	8.67	4345	869	3128	2606	2172	1737	
	4.500		0.237	10.79	5477	1095	3943	3286	2738	2190	
	4.500		XS	0.337	14.98	7788	1558	5607	4673	3894	3115
6"	6.625	STD	0.156	10.79	2449	490	1763	1469	1224	979	
	6.625		0.188	12.94	2951	590	2124	1770	1475	1180	
	6.625		0.219	15.00	3438	688	2475	2062	1718	1375	
	6.625		0.250	17.04	3925	785	2825	2354	1962	1569	
	6.625		STD	0.280	18.99	4395	879	3164	2637	2197	1758
	6.625		XS	0.432	28.60	6782	1356	4882	4068	3390	2712
8"	8.625	STD	0.188	16.96	2267	453	1632	1360	1133	906	
	8.625		0.219	19.68	2641	528	1901	1584	1320	1056	
	8.625		0.250	22.38	3014	603	2170	1808	1507	1205	
	8.625		0.277	24.72	3340	668	2404	2004	1670	1336	
	8.625		STD	0.322	28.58	3883	777	2795	2329	1941	1553
	8.625		XS	0.500	43.33	6029	1206	4340	3617	3014	2411
10"	10.750	STD	0.188	21.23	1819	364	1309	1091	909	727	
	10.750		0.219	24.65	2119	424	1525	1271	1059	847	
	10.750		0.250	28.06	2419	484	1741	1451	1209	967	
	10.750		0.279	31.23	2699	540	1943	1619	1349	1079	
	10.750		STD	0.365	40.52	3531	706	2542	2118	1765	1412
	10.750		XS	0.500	54.79	4837	967	3482	2902	2418	1934
12"	12.750	STD	0.219	29.34	1786	357	1286	1071	893	714	
	12.750		0.250	33.41	2039	408	1468	1223	1019	815	
	12.750		0.281	37.46	2292	458	1650	1375	1146	916	
	12.750		0.312	41.48	2545	509	1832	1526	1272	1017	
	12.750		STD	0.375	49.61	3059	612	2202	1835	1529	1223
	12.750		XS	0.500	65.48	4078	816	2936	2447	2039	1631

* STD = Standard
* XS = Extra Strong

TABLE A-1.7



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff *(Signature)*

Approved By: Jerome T. Schmitz *(Signature)*

Section No: MS A-1
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PIPE AND TUBING

Pipe, Line, API Specification 5L

APPENDIX D

(Cont'd)

GRADE X-52 (Cont'd) (Measurements in Inches) (Based on SMYS = 52000 psig)											
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS				
							1	2	3	4	
16"	16.000	STD	0.219	36.95	1424	285	1024	854	711	569	
	16.000		0.250	42.09	1625	325	1170	975	812	650	
	16.000		0.312	52.32	2028	406	1460	1216	1014	811	
	16.000		0.344	57.57	2236	447	1609	1341	1118	894	
	16.000		0.375	62.64	2438	488	1755	1462	1218	975	
	16.000		0.438	72.86	2847	569	2049	1708	1423	1138	
	16.000		XS	0.500	82.85	3250	650	2340	1950	1625	1300
20"	20.000	STD	0.250	52.78	1300	260	936	780	650	520	
	20.000		0.281	59.23	1461	292	1052	876	730	584	
	20.000		0.312	65.66	1622	324	1168	973	811	648	
	20.000		0.344	72.28	1789	358	1287	1073	894	715	
	20.000		0.375	78.67	1950	390	1404	1170	975	780	
	20.000		0.438	91.59	2278	456	1639	1366	1138	911	
	20.000		XS	0.500	104.23	2600	520	1872	1560	1300	1040
24"	24.000	STD	0.281	71.25	1218	244	876	730	608	487	
	24.000		0.312	79.01	1352	270	973	811	676	540	
	24.000		0.344	86.99	1491	298	1073	894	745	596	
	24.000		0.375	94.71	1625	325	1170	975	812	650	
	24.000		0.438	110.32	1898	380	1366	1138	949	759	
	24.000		XS	0.500	125.61	2167	433	1560	1300	1083	866
	24.000		0.688	171.45	2981	596	2146	1788	1490	1192	
30"	30.000	STD	0.312	99.02	1082	216	778	648	540	432	
	30.000		0.344	109.06	1193	239	858	715	596	477	
	30.000		0.375	118.76	1300	260	936	780	650	520	
	30.000		0.438	138.42	1518	304	1093	911	759	607	
	30.000		XS	0.500	157.68	1733	347	1248	1040	866	693
	30.000		0.688	215.58	2385	477	1717	1431	1192	954	

* STD = Standard
 * XS = Extra Strong

TABLE A-1.7

(Cont'd)



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff

Approved By: Jerome T. Schmitz

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PIPE AND TUBING

Pipe, Line, API Specification 5L

APPENDIX E

GRADE X-60 (Measurements in Inches) (Based on SMYS = 60000 psig)										
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS			
							1	2	3	4
4"	4.500	STD	0.156	7.24	4160	832	2995	2496	2080	1664
	4.500		0.188	8.67	5013	1003	3609	3008	2506	2005
	4.500		0.237	10.79	6320	1264	4550	3792	3160	2528
	4.500		0.337	14.98	8987	1797	6470	5392	4493	3594
6"	6.625	STD	0.156	10.79	2826	565	2034	1695	1412	1130
	6.625		0.188	12.94	3405	681	2451	2043	1702	1362
	6.625		0.219	15.00	3967	793	2856	2380	1983	1586
	6.625		0.250	17.04	4528	906	3260	2716	2264	1811
	6.625		0.280	18.99	5072	1014	3651	3043	2535	2028
	6.625		0.432	28.60	7825	1565	5633	4694	3912	3129
8"	8.625	STD	0.188	16.96	2616	523	1883	1569	1307	1046
	8.625		0.219	19.68	3047	609	2193	1828	1523	1218
	8.625		0.250	22.38	3478	696	2504	2086	1739	1391
	8.625		0.277	24.72	3854	771	2774	2312	1926	1541
	8.625		0.322	28.58	4480	896	3225	2688	2240	1792
	8.625		0.500	43.33	6957	1391	5008	4173	3478	2782
10"	10.750	STD	0.188	21.23	2099	420	1510	1259	1049	839
	10.750		0.219	24.65	2445	489	1760	1466	1222	977
	10.750		0.250	28.06	2791	558	2009	1674	1395	1116
	10.750		0.279	31.23	3114	623	2242	1868	1557	1245
	10.750		0.365	40.52	4074	815	2933	2444	2037	1629
	10.750		0.500	54.79	5581	1116	4018	3348	2790	2232
12"	12.750	STD	0.219	29.34	2061	412	1484	1236	1030	824
	12.750		0.250	33.41	2353	471	1694	1411	1176	941
	12.750		0.281	37.46	2645	529	1904	1586	1322	1057
	12.750		0.312	41.48	2936	587	2114	1761	1468	1174
	12.750		0.375	49.61	3529	706	2541	2117	1764	1411
	12.750		0.500	65.48	4706	941	3388	2823	2352	1882

* STD = Standard
 * XS = Extra Strong

TABLE A-1.9



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff *[Signature]*

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

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PIPE AND TUBING

Pipe, Line, API Specification 5L

APPENDIX E

(Cont'd)

GRADE X-60 (Cont'd) (Measurements in Inches) (Based on SMYS = 60000 psig)											
Nominal Pipe Size (Inches)	OD	Designation*	Wall Thickness	Weight Lb./Ft.	Pressure At 100% SMYS	Pressure At 20% SMYS	Design Pressure (psig) for CLASS LOCATIONS				
							1	2	3	4	
16"	16.000	STD	0.219	36.95	1643	329	1182	985	821	657	
	16.000		0.250	42.09	1875	375	1350	1125	937	750	
	16.000		0.312	52.32	2340	468	1684	1404	1170	936	
	16.000		0.344	57.57	2580	516	1857	1548	1290	1032	
	16.000		0.375	62.64	2813	563	2025	1687	1406	1125	
	16.000		0.438	72.86	3285	657	2365	1971	1642	1314	
	16.000		XS	0.500	82.85	3750	750	2700	2250	1875	1500
20"	20.000	STD	0.250	52.78	1500	300	1080	900	750	600	
	20.000		0.281	59.23	1686	337	1213	1011	843	674	
	20.000		0.312	65.66	1872	374	1347	1123	936	748	
	20.000		0.344	72.28	2064	413	1486	1238	1032	825	
	20.000		0.375	78.67	2250	450	1620	1350	1125	900	
	20.000		0.438	91.59	2628	526	1892	1576	1314	1051	
	20.000		XS	0.500	104.23	3000	600	2160	1800	1500	1200
24"	24.000	STD	0.281	71.25	1405	281	1011	843	702	562	
	24.000		0.312	79.01	1560	312	1123	936	780	624	
	24.000		0.344	86.99	1720	344	1238	1032	860	688	
	24.000		0.375	94.71	1875	375	1350	1125	937	750	
	24.000		0.438	110.32	2190	438	1576	1314	1095	876	
	24.000		XS	0.500	125.61	2500	500	1800	1500	1250	1000
	24.000		0.688	171.45	3440	688	2476	2064	1720	1376	
30"	30.000	STD	0.312	99.02	1248	250	898	748	624	499	
	30.000		0.344	109.06	1376	275	990	825	688	550	
	30.000		0.375	118.76	1500	300	1080	900	750	600	
	30.000		0.438	138.42	1752	350	1261	1051	876	700	
	30.000		XS	0.500	157.68	2000	400	1440	1200	1000	800
	30.000		0.688	215.58	2752	550	1981	1651	1376	1100	

* STD = Standard
 * XS = Extra Strong

TABLE A-1.9