

# BLACK AND GALVANIZED PIPE

## A53 SEAMLESS, ERW, A500, A1085 & A-106 SEAMLESS

### Schedule Weight Pipe

#### Seamless and Welded Steel Pipe, Plain End

**UPPER FIGURES—Wall Thickness in Inches**  
**LOWER FIGURES—Weight Per Foot in Pounds**

Size: Nominal in.	Size: OD in.	USAS PIPE SCHEDULES												Double Extra Heavy			
		10	20	30	40	STD.	60	80	Extra Heavy	100	120	140	160				
1/8	.405				.068	.068		.095	.095								
					.24	.24		.31	.31								
1/4	.540				.088	.088		.119	.119								
					.42	.42		.54	.54								
3/8	.675				.091	.091		.126	.126								
					.57	.57		.74	.74								
1/2	.840				.109	.109		.147	.147					.188	.294		
					.85	.85		1.09	1.09					1.31	1.71		
3/4	1.050				.113	.113		.154	.154					.219	.308		
					1.13	1.13		1.47	1.47					1.94	2.44		
1	1.315				.133	.133		.179	.179					.250	.358		
					1.68	1.68		2.17	2.17					2.84	3.66		
1 1/4	1.660				.140	.140		.191	.191					.250	.382		
					2.27	2.27		3.00	3.00					3.76	5.21		
1 1/2	1.900				.145	.145		.200	.200					.281	.400		
					2.72	2.72		3.63	3.63					4.86	6.41		
2	2.375				.154	.154		.218	.218					.344	.436		
					3.65	3.65		5.02	5.02					7.46	9.03		
2 1/2	2.875				.203	.203		.276	.276					.375	.552		
					5.79	5.79		7.66	7.66					10.01	13.70		
3	3.500				.216	.216		.300	.300					.438	.600		
					7.58	7.58		10.25	10.25					14.32	18.58		
3 1/2	4.000				.226	.226		.318	.318					—	—		
					9.11	9.11		12.51	12.51					—	—		
5	5.563				.258	.258		.375	.375			.500		.625	.750		
					14.62	14.62		20.78	20.78			27.04		32.96	38.55		
6	6.625				.280	.280		.432	.432			.562		.719	.864		
					18.97	18.97		28.57	28.57			36.39		45.35	53.16		
8	8.625		.250	.277	.322	.322	.406	.500	.500	.594	.719	.812	.906	.875			
			22.36	24.70	28.55	28.55	35.64	<u>43.39</u>	<u>43.39</u>	50.95	60.71	67.76	74.69	72.42			
10	10.750		.250	.307	.365	.365	.500	.594	.500	.719	.844	1.000	1.125	—			
			28.04	34.24	<u>40.48</u>	<u>40.48</u>	54.74	64.43	54.74	77.03	89.29	104.13	115.64	—			
12	12.750		.250	.330	.406	.375	.562	.688	.500	.844	1.000	1.125	1.312	—			
			33.38	43.77	53.52	49.56	73.15	88.63	65.42	107.32	125.49	139.67	160.27	—			
14	14.000	.250	.312	.375	.438	.375	.594	.750	.500	.938	1.094	1.250	1.406	—			
		36.71	45.61	54.57	63.44	54.57	85.05	106.13	72.09	130.85	150.79	170.21	189.11	—			
16	16.000	.250	.312	.375	.500	.375	.656	.844	.500	1.031	1.219	1.438	1.594	—			
		42.05	52.27	62.58	82.77	62.58	107.50	136.61	82.77	164.82	192.43	223.64	245.25	—			
18	18.000	.250	.312	.438	.562	.375	.750	.938	.500	1.156	1.375	1.562	1.781	—			
		47.39	58.94	82.15	04.67	70.59	138.17	170.92	93.45	207.96	244.14	274.22	308.50	—			
20	20.000	.250	.375	.500	.594	.375	.812	1.031	.500	1.281	1.500	1.750	1.969	—			
		52.73	78.60	104.13	123.11	78.60	166.40	208.87	104.13	256.10	296.37	341.09	379.17	—			
22	22.000	.250	.375	.500	—	.375	.875	1.125	.500	1.375	1.625	1.875	2.125	—			
		58.07	86.61	114.81	—	86.61	197.41	250.82	114.81	302.88	354.51	403.00	451.06	—			
24	24.000	.250	.375	.562	.688	.375	.969	1.219	.500	1.531	1.812	2.062	2.344	—			
		63.41	94.62	140.68	171.29	94.62	238.35	296.58	125.49	367.39	429.39	483.12	542.13	—			

# PIPE SPECIFICATIONS

<b>SPECIFICATION</b>	<b>A53</b> Sizes ½"—26" Std., XS and XXS, A.N.S.I. Schedules 10 through 160—Other sizes subject to inquiry.																																																							
<b>Scope</b>	Covers seamless and welded BLACK and hot-dipped galvanized nominal (average) wall pipe for coiling, bending, flanging and other special purposes and is suitable for welding. CONTINUOUS WELD pipe is not intended for flanging (rail back operation to form flange using pipe wall). Purpose for which pipe is intended should be stated on order.																																																							
<b>Kinds of Steel Permitted For Pipe Material</b>	Open-hearth Electric-furnace Basic-oxygen																																																							
<b>Hot-Dipped Galvanizing</b>	Sets standards for coating of pipe with zinc inside and outside by the hot-dipped process. Weight of coating must not average less than 1.8 oz. per square foot and not less than 1.6 oz. per square foot.																																																							
<b>Permissible Variations in Wall Thickness</b>	Same as A120.																																																							
<b>Chemical Requirements</b>	<table border="0"> <tr> <td></td> <td colspan="4">Type S (Seamless pipe) &amp; Type E (electric weld)</td> </tr> <tr> <td></td> <td colspan="4">Open-Hearth, Electric-Furnace or Basic Oxygen</td> </tr> <tr> <td></td> <td colspan="4">Composition—Max %</td> </tr> <tr> <td></td> <td>C</td> <td>Mn</td> <td>P</td> <td>S</td> </tr> <tr> <td></td> <td>Grade A 0.25</td> <td>0.95</td> <td>0.05</td> <td>0.06</td> </tr> <tr> <td></td> <td>Grade B 0.30</td> <td>1.20</td> <td>0.05</td> <td>0.06</td> </tr> <tr> <td></td> <td colspan="4">Type F (furnace-welded pipe)</td> </tr> <tr> <td></td> <td colspan="4">Open-Hearth, Electric-Furnace or Basic Oxygen</td> </tr> <tr> <td></td> <td colspan="4">Composition—Max %</td> </tr> <tr> <td></td> <td>C</td> <td>Mn</td> <td>P</td> <td>S</td> </tr> <tr> <td></td> <td>—</td> <td>—</td> <td>0.08</td> <td>0.06</td> </tr> </table>		Type S (Seamless pipe) & Type E (electric weld)					Open-Hearth, Electric-Furnace or Basic Oxygen					Composition—Max %					C	Mn	P	S		Grade A 0.25	0.95	0.05	0.06		Grade B 0.30	1.20	0.05	0.06		Type F (furnace-welded pipe)					Open-Hearth, Electric-Furnace or Basic Oxygen					Composition—Max %					C	Mn	P	S		—	—	0.08	0.06
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<b>Hydrostatic Testing</b>	Hydrostatic inspection test pressures for plain end and threaded and coupled pipe are specified. Hydrostatic pressure shall be maintained for not less than 5 seconds for all sizes of seamless and electric-weld pipe.																																																							
<b>Permissible Variations in Weights per Foot</b>	For Extra Strong and lighter wall thicknesses Plus or Minus 5% For heavier than extra strong wall thicknesses Plus or Minus 10%																																																							
<b>Permissible Variations in Outside Diameter</b>	Same as A120.																																																							
<b>Mechanical Tests Specified</b>	Tensile Test—Transverse required on EW sizes 8¾" and larger. Bending Test (Cold) Std. and XS-2" and under. XXS-1¼" and under. <table border="0"> <tr> <td></td> <td>Degree of Bend</td> <td>Diameter of Mandrel</td> </tr> <tr> <td>For Normal A53 Uses</td> <td>90</td> <td>12 x nom. dia. of pipe</td> </tr> <tr> <td>For Close Coiling</td> <td>180</td> <td>8 x nom. dia. of pipe</td> </tr> </table> Flattening Test 2½" and larger Std. and XS (Not required for XXS pipe).		Degree of Bend	Diameter of Mandrel	For Normal A53 Uses	90	12 x nom. dia. of pipe	For Close Coiling	180	8 x nom. dia. of pipe																																														
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<b>Number of Tests Required</b>	Seamless and Continuous Weld—Bending, flattening tensile on one length of pipe from each lot of 500 lengths or less of a size. Electric-Weld—Bending and tensile on one length of pipe from each lot of 500 lengths or less of a size. Electric-Weld—Flattening on both crop ends of each length. (Coil, in case of multiple lengths.)																																																							
<b>Lengths</b>	Same as A120. (Lengths longer than single random, heavier wall than XS subject to negotiation.)																																																							
<b>Required Markings on Each Length</b> (On Tags attached to each Bundle in case of Bundled Pipe)	Rolled, Stamped or Stenciled Name of brand or manufacturer Kind of pipe, that is, furnace-continuous weld, EW-A, seamless B, etc. XS—for extra strong. XXS—for double extra strong. ASTM A 53. Also necessary to indicate when electric-furnace, or basic-oxygen steel is used. Length of pipe.																																																							
<b>General Information</b>	Couplings—Applied handling tight. Couplings, 2" and smaller straight tapped, other sizes taper tapped. Line pipe couplings may be specified. Thread Protection—Same as specified under A120. End Finish (unless otherwise specified) Std. or XS, or wall thicknesses less than 0.500 in. (excluding XXS): Plain end beveled. EW pipe may be furnished cold expanded. All XXS and wall thicknesses over 0.500 in.: Plain end square cut.																																																							

# PIPE SPECIFICATIONS

<b>SPECIFICATION</b>	<b>A106</b> Sizes 1/8"—26" A.N.S.I. Schedules to 160—Other sizes subject to inquiry.																								
<b>Scope</b>	Covers SEAMLESS carbon steel nominal wall pipe for high-temperature service, suitable for bending, flanging and similar forming operations. Sizes 1½" and under may be either hot finished or cold drawn. Sizes 2" and larger shall be hot finished unless otherwise specified.																								
<b>Kinds of Steel Permitted For Pipe Materials</b>	Killed open-hearth Electric-furnace Basic-oxygen																								
<b>Hot-Dipped Galvanizing</b>	Not covered in specification.																								
<b>Permissible Variations in Wall Thickness</b>	Same as A120.																								
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<b>Hydrostatic Testing</b>	Inspection test pressures produce a stress in the pipe wall equal to 60% of minimum specified Yield Point at room temperature. Maximum Pressures are not to exceed 2500 psi for sizes 3" and under, and 2800 psi for the larger sizes. Pressure is maintained for not less than 5 seconds.																								
<b>Permissible Variations in Weights per Foot</b>	For Schedules 120 and under—Weight of any length shall not vary more than 6.5% over and 3.5% under. For Schedules heavier than 120—Weight of any length shall not vary more than 10% over and 3.5% under. NOTE: Size 4" and smaller—weighed in lots. Larger sizes—by length.																								
<b>Permissible Variations in Outside Diameter</b>	Outside Diameter at any point shall not vary from standard specified more than— <table border="0"> <tr> <td></td> <td>Over</td> <td>Under</td> </tr> <tr> <td>Sizes 1½" and smaller</td> <td>¼"</td> <td>½"</td> </tr> <tr> <td>2"—4"</td> <td>½"</td> <td>½"</td> </tr> <tr> <td>5"—8"</td> <td>⅛"</td> <td>½"</td> </tr> <tr> <td>10"—18"</td> <td>⅜"</td> <td>½"</td> </tr> <tr> <td>20"—24"</td> <td>⅛"</td> <td>½"</td> </tr> </table>		Over	Under	Sizes 1½" and smaller	¼"	½"	2"—4"	½"	½"	5"—8"	⅛"	½"	10"—18"	⅜"	½"	20"—24"	⅛"	½"						
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<b>Mechanical Tests Specified</b>	Tensile Test—All sizes—either transverse or longitudinal acceptable. Bending Test (Cold)—2" and under. <table border="0"> <tr> <td></td> <td>Degree of Bend</td> <td>Diameter of Mandrel</td> </tr> <tr> <td>For Normal A106 Uses</td> <td>90</td> <td>12 x nom. dia. of pipe</td> </tr> <tr> <td>For Close Coiling</td> <td>180</td> <td>8 x nom. dia. of pipe</td> </tr> </table> Flattening test—Over 2"		Degree of Bend	Diameter of Mandrel	For Normal A106 Uses	90	12 x nom. dia. of pipe	For Close Coiling	180	8 x nom. dia. of pipe															
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<b>Number of Tests Required</b>	<table border="0"> <tr> <td></td> <td colspan="2">On One Length From Each Lot of</td> </tr> <tr> <td>tensile</td> <td>5" and smaller</td> <td>400 or less</td> </tr> <tr> <td></td> <td>6" and larger</td> <td>200 or less</td> </tr> <tr> <td>Bending</td> <td>2" and smaller</td> <td>400 or less</td> </tr> <tr> <td>Flattening</td> <td>over 2" through 5"</td> <td>400 or less</td> </tr> <tr> <td></td> <td>6" and over</td> <td>200 or less</td> </tr> </table>		On One Length From Each Lot of		tensile	5" and smaller	400 or less		6" and larger	200 or less	Bending	2" and smaller	400 or less	Flattening	over 2" through 5"	400 or less		6" and over	200 or less						
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<b>Lengths</b>	Lengths required shall be specified in order. No "joints" permitted unless otherwise specified. If no definite lengths required, following practice applies: Single Random—16'22"—5% may be 12'-16'. Double Random—Minimum length 22', Minimum average 35'—5% may be 16'-22'.																								
<b>Required Markings on Each Length</b> (On Tags attached to each Bundle in case of Bundled Pipe.)	Rolled, Stamped or Stenciled Manufacturer's private identifying mark. ANSI schedule number. ASTM A106 A, A106B, or A106C. Weight (4" and larger). Hydrostatic test pressure. Additional "S" if tested to supplementary requirements. Length of pipe.																								
<b>General Information</b>	Unless otherwise specified, pipe furnished with plain ends. Surface finish standards are outlined in specification.																								

# PIPE SPECIFICATIONS

<b>SPECIFICATION</b>	<b>API5L</b> Sizes ½"—48"																																																		
<b>Scope</b>	Covers WELDED and SEAMLESS pipe suitable for use in conveying gases, water, and oil in both the oil and natural gas industries.																																																		
<b>Kinds of Steel Permitted For Pipe Material</b>	Open-hearth Electric-furnace Basic-oxygen																																																		
<b>Hot-Dipped Galvanizing</b>	May be ordered galvanized to requirements of ASTM A120.																																																		
<b>Permissible Variations in Wall Thickness</b>	Tolerances on wall thicknesses shall not be more than those listed at right from the nominal walls specified.																																																		
<b>Chemical</b>	<table border="0"> <tr> <td></td> <td>Carbon</td> <td>Manganese</td> <td>Phosphorous</td> <td>Sulphur</td> </tr> <tr> <td></td> <td>% Max.</td> <td>% Max.</td> <td>% Max.</td> <td>% Max.</td> </tr> <tr> <td>SMLS Grade A</td> <td>0.22</td> <td>0.90</td> <td>0.04</td> <td>0.05</td> </tr> <tr> <td>SMLS Grade B</td> <td>0.27</td> <td>1.15</td> <td>0.04</td> <td>0.05</td> </tr> <tr> <td>SMLS A25 Class I</td> <td>0.21</td> <td>0.30-0.60</td> <td>0.045</td> <td>0.06</td> </tr> <tr> <td>SMLS A25 Class II</td> <td>0.21</td> <td>0.30-0.60</td> <td>0.045-0.080</td> <td>0.06</td> </tr> <tr> <td>EW and DSA Grade A</td> <td>0.21</td> <td>0.90</td> <td>0.04</td> <td>0.05</td> </tr> <tr> <td>EW and DSA Grade B</td> <td>0.26</td> <td>1.15</td> <td>0.04</td> <td>0.05</td> </tr> <tr> <td>EW A25 Class I</td> <td>0.21</td> <td>0.30-0.60</td> <td>0.045</td> <td>0.06</td> </tr> <tr> <td>EW A25 Class II</td> <td>0.21</td> <td>0.30-0.60</td> <td>0.045-0.080</td> <td>0.06</td> </tr> </table>		Carbon	Manganese	Phosphorous	Sulphur		% Max.	% Max.	% Max.	% Max.	SMLS Grade A	0.22	0.90	0.04	0.05	SMLS Grade B	0.27	1.15	0.04	0.05	SMLS A25 Class I	0.21	0.30-0.60	0.045	0.06	SMLS A25 Class II	0.21	0.30-0.60	0.045-0.080	0.06	EW and DSA Grade A	0.21	0.90	0.04	0.05	EW and DSA Grade B	0.26	1.15	0.04	0.05	EW A25 Class I	0.21	0.30-0.60	0.045	0.06	EW A25 Class II	0.21	0.30-0.60	0.045-0.080	0.06
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<b>Required Markings on Each Length</b> (On Tags attached to each Bundle in case of Bundled Pipe.)	Paint Stenciled (Rolled at Mfrs. Option) Manufacturer's name or mark, API monogram, size, grade, process of manufacture, type of steel, length, weight per foot (4" and larger only). Test pressure when higher than tabulated (2" and larger only).																																																		
<b>General Information</b>	Couplings—Applied handling tight. All sizes are recessed, taper tapped. Thread Protection (all shipments)— 1½" and Smaller Burlap 2" to 3½" Metal Protectors 4" and Over Metal Protectors																																																		

# ASTM A1085

	ASTM A500-10 Grade B	ASTM A1085
Manufacture Process	Cold-Formed Welded	Cold-Formed Welded
Maximum Perimeter	88"	88"
Thickness Range	t<0.875"	0.148" - 0.875"
Yield Strength	Round-42 ksi min.	All Shapes-50 ksi min 70 ksi min
	Round-46 ksi min.	
Tensile Strength	Round-58 ksi min.	All Shapes-65 ksi min.
	Shapes-58 ksi min.	
Wall Thickness	+/- 10%	+10% / -5%
Mass Tolerance	NA	-3.5%
Corner Radii	No More Than 3t max.	t≤0.400 1.6t to 3.0t
		t>0.400 1.8t to 3.0t
CVN	NA	25 ft-lbs @ 40°F
Elongation, min in 2:	23%	21%

## ASTM A500 – ASTM A252 COMPARISON

	ASTM A500 / A500M -13		ASTM A252 -10	
	ASTM A500M-13 covers cold-formed welded and seamless carbon steel round, square, rectangular, or special shape structural tubing for welded, riveted, or bolted construction of bridges and buildings, and for general structural purposes.		ASTM A252-10 covers nominal wall cylindrical steel pipe piles in which the steel cylinder acts as a permanent load-carrying member or as a shell to form cast-in-place concrete piles.	
Rounds	ASTM A500		ASTM A252	
	Grade B	Grade C	Grade 2	Grade 3
Yield Strength	42,000 psi min	46,000 psi min	35,000 psi min	45,000 psi min
Tensile Strength	58,000 psi min	62,000 psi min	60,000 psi min	66,000 psi min
Elongation in 2"	23	21	25	20
	ASTM A500		ASTM A252	
	Grade B	Grade C	All Grades	
Carbon	.26 max	.23 max	N/A	
Manganese	1.35 max	1.35 max	N/A	
Phosphorus	.035 max	.035 max	.050 max	
Sulphur	.035 max	.035 max	N/A	
Silicon	N/A	N/A	N/A	
	ASTM A500		ASTM A252	
O.D. Size	All Grades		All Grades	
>1.9 to 2.5 incl.	±0.75%		±1%	
>2.5 to 3.5 incl.	±0.75%		±1%	
>3.5 to 5.5 incl.	±0.75%		±1%	
>5.5	±0.75%		±1%	
Wall Thickness	±10%		-12.5%	
Weight	Not Specified		15.0% over or 5% under its theoretical weight	
Straightness	1/8" x length (in feet)÷5		Not Specified	