

PIPE SPECIFICATION A53



Specification	A53 NPS 1/8 – 26 STD. XS and XXS, ANSI Schedules 10 through 160																									
Scope	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-Welded pipe is not intended for flanging. Purpose for which pipe is intended should be stated on order.																									
Kinds of Steel Permitted For Pipe Material	Open-hearth. Basic-oxygen. Electric-furnace.																									
Hot-Dipped Galvanizing	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.																									
Permissible Variations in Wall Thickness	The minimum wall thickness at any point shall not be more than 12.5% under the nominal wall thickness specified.																									
Chemical Requirements	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">C max %</th> <th style="text-align: center;">Mn max %</th> <th style="text-align: center;">P max %</th> <th style="text-align: center;">S max %</th> </tr> </thead> <tbody> <tr> <td colspan="5"><u>Seamless or ERW</u></td> </tr> <tr> <td>Grade A</td> <td style="text-align: center;">0.25</td> <td style="text-align: center;">0.95</td> <td style="text-align: center;">0.05</td> <td style="text-align: center;">0.06</td> </tr> <tr> <td>Grade B</td> <td style="text-align: center;">0.30</td> <td style="text-align: center;">1.20</td> <td style="text-align: center;">0.05</td> <td style="text-align: center;">0.06</td> </tr> <tr> <td>Continuous-weld</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td style="text-align: center;">0.08</td> <td style="text-align: center;">0.06</td> </tr> </tbody> </table>		C max %	Mn max %	P max %	S max %	<u>Seamless or ERW</u>					Grade A	0.25	0.95	0.05	0.06	Grade B	0.30	1.20	0.05	0.06	Continuous-weld	-	-	0.08	0.06
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Hydrostatic Testing	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 resistance-weld pipe.																									
Permissible Variations in Weights per Foot	Plus or Minus 10%																									
Permissible Variations in Outside Diameter	Outside Diameter at any point shall not vary from standard specified more than – <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>For NPS 1 1/2 and Smaller Sizes</u></th> <th colspan="2" style="text-align: center;"><u>For NPS 2 and Larger Sizes</u></th> </tr> </thead> <tbody> <tr> <td>1/64"</td> <td style="text-align: center;">1/32" under</td> <td style="text-align: center;">1% over 1% under</td> </tr> </tbody> </table>	<u>For NPS 1 1/2 and Smaller Sizes</u>	<u>For NPS 2 and Larger Sizes</u>		1/64"	1/32" under	1% over 1% under																			
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Mechanical Tests Specified	<p>Tensile Test – Transverse required on ERW for NPS 8 and large. Sending Test (Cold) – STD and XS-NPS 2 and under XXS-NPS 1 1/4 and under.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;"><u>Degree of Bend</u></th> <th style="text-align: center;"><u>Diameter of Mandrel</u></th> </tr> </thead> <tbody> <tr> <td>For Normal A53 Uses</td> <td style="text-align: center;">90</td> <td style="text-align: center;">12 x nom. dia. of pipe</td> </tr> <tr> <td>For Close Coiling</td> <td style="text-align: center;">180</td> <td style="text-align: center;">8 x nom. dia. of pipe</td> </tr> </tbody> </table> <p>Flattening Test – NPS 2 and larger STD and XS. (Not required for XXS pipe).</p>		<u>Degree of Bend</u>	<u>Diameter of Mandrel</u>	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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Number of Tests Required	<p>Seamless and Electric-Resistance-Welded -- Bending, flattening, tensile on one length of pipe from each lot of 500 lengths or less of a size.</p> <p>Continuous-Weld -- Bending, flattening, tensile</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><u>NPS 1 1/2 & smaller</u></th> <th style="text-align: center;"><u>NPS 2 & larger</u></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">one/25 tons</td> <td style="text-align: center;">one/50 tons</td> </tr> </tbody> </table>	<u>NPS 1 1/2 & smaller</u>	<u>NPS 2 & larger</u>	one/25 tons	one/50 tons																					
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Lengths	<p>Standard Weight</p> <p>Single Random – 16' - 22'. 5% may be jointers. If Plain Ends – 5% may be 12' - 16'. Double Random – Shortest Length 22', minimum average for order 35'. Extra Strong & Double Extra Strong</p> <p>Single Random – 12' - 22'. 5% may be 6' - 12'. Double Random (XS and lighter) – Shortest Length 22', minimum average for order 35'. Lengths longer than single random with wall thicknesses heavier than XS subject to negotiation.</p>																									
Required Markings on Each Length (On Tags attached to each Bundle in case of Bundled Pipe)	<p>Rolled, Stamped or Stenciled (Mfrs. Option) Name or brand of manufacturer. Kind of pipe, that is, Continuous Welded, Electric-Resistance-Welded A, Electric-Resistance-Welded B, Seamless A; or Seamless B; XS for extra strong, XXS for double extra strong. ASTM A53 Length of pipe.</p>																									
General Information	<p>Couplings – Applied handling tight. Couplings, 2" and smaller straight tapped, other sizes taper tapped. Thread Protection – Applied to pipe 4" and large. End Finish (unless otherwise specified) – STD or XS, or wall thicknesses less than 0.500 in. (excluding XXS): Plain and beveled. All XXS and wall thicknesses over 0.500 in.: Plain end square cut.</p>																									

ASTM A 53 TYPE E GRADE B PIPE



SCOPE

Covers black and hot-dipped galvanized electric-resistance welded Grade B pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Wheatland ASTM A 53 is UL Listed and FM Approved, sizes 1" through 6" nominal, for use in Fire Sprinkler Pipe Applications. Pipe is suitable for welding, threading and grooving. Produced to the latest revision of ASTM A 53/ 53M, Federal Specification WW-P404 and ASME B36.10M.

MANUFACTURE

The weld seam shall be heat treated after welding to a minimum of 1400 OF or be otherwise processed in such a manner that no untempered martensite remains.

HOT-DIPPED GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside).

When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

HYDROSTATIC AND NONDESTRUCTIVE ELECTRIC TESTING

Hydrostatic inspection test pressures for plain-end pipe are listed in Table X 2.2 of the A53/A 53M specification. Test pressures shall be maintained for a minimum of five seconds.

Nondestructive electric testing of the weld seam is required on each length of ERW pipe NPS 2 and larger.

CHEMICAL REQUIREMENTS

Composition, max. %

Carbon	Manganese	Phosphorus	Sulfur	
.30	1.20	.05	.045	
*Copper	*Nickel	*Chromium	*Molybdenum	*Vanadium
.40	.40	.40	.15	.08

*The combination of these five elements shall not exceed 1.00%.

TENSILE REQUIREMENTS

Tensile Strength, min. 60 000 psi

Yield Strength, min. 35 000 psi

Elongation in 2" Refer to A 53 Table x 4.1

BENDING TEST (COLD)

For NPS 2 and under

Degree of Bend

90°

Diameter of Mandrel 12 x outside pipe diameter

FLATTENING TEST

As a test for ductility of the weld for pipe 2-1/2" NPS and larger, position the weld at 00 and alternately at 900 to the direction of force and flatten until the OD is 2/3 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

FREQUENCY OF TESTS

Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size. Refer to A 53 specification for frequency of flattening tests.

END FINISH

Plain End: NPS 2 and larger, STD and XS weights: ends beveled to angle of 300, +50, -00 with a root face of 1/16" + 1/32"

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A 865

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

Pipe NPS 2 and larger shall not vary more than + 1% from the standard specified

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT.

Pipe shall not vary more than + 10% from the standard specified.

PRODUCT MARKING

Each length of pipe is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A 53), the kind of pipe E for Electric Resistance Welded, B for Grade B, the size, XS for extra strong, and length. Stencil markings indicate UL Listing and FM Approval for sizes 1" through 6" nominal for use in Fire Sprinkler Pipe Applications. Bar coding is acceptable as a supplementary identification method.

STANDARD (SCH. 40) BLACK PLAIN END			
Nominal Size	O.D. Inches	Nominal Wall	Weight/ Lb. Ft
2"	2.375	.154	3.66
2-1/2"	2.875	.203	5.80
3"	3.500	.216	7.58
4"	4.500	.237	10.88
5"	5.563	.258	14.63
6"	6.625	.280	18.99
8"	8.625	.322	28.58
EXTRA STRONG (SCH.80) BLACK PLAIN END			
Nominal Size	O.D. Inches	Nominal Wall	Weight/ Lb. Ft
2"	2.375	.218	5.03
2-1/2"	2.875	.276	7.67
3"	3.500	.300	10.26
4"	4.500	.337	15.00

ASTM A 53 TYPE F GRADE A PIPE

SCOPE

Covers black and hot-dipped galvanized furnace-butt welded (continuous welded) Grade A pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Wheatland ASTM A 53 is UL Listed and FM Approved, sizes 1" through 6" nominal, for use in Fire Sprinkler Pipe Applications. Pipe is suitable for welding, threading, grooving and bending. Pipe is not intended for flanging. Produced to latest revisions of ASTM A53/A 53M, Federal Specification WW-P404 and ASME B36.10M.

HOT-DIPPED GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside). When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

HYDROSTATIC TESTING

Hydrostatic test pressures for plain-end pipe are indicated below.

NPS	Standard Weight - PSI	Extra Strong Weight - PSI
1/8 through 3/8	700	850
1/2 through 1	1500	1500
1-1/4 - 1-1/2	2000	2000
2 through 3	2500	2500
3 1/2 - 4	2800	2800

END FINISH

Plain End:

NPS 1-1/2 and smaller: unless otherwise specified on order, end finish shall be at the option of the manufacturer.

NPS 2 and larger: STD and Sch 80 weights: ends beveled to angle of 300, +50, -00 with a root face of 1/16" + 1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A 865.

CHEMICAL REQUIREMENTS

Composition, max. %

Carbon Manganese Phosphorus Sulfur

.30 1.20 .05 .045

*Copper *Nickel *Chromium *Molybdenum *Vanadium

.40 .40 .40 .15 .08

*The combination of these five elements shall not exceed 1.00%.

TENSILE REQUIREMENTS

Tensile Strength, min. 48 000 psi

Yield Strength, min. 30 000 psi.

Elongation in 2" Refer to A 53 Table x 4.1, latest revision – ASTM A53/A 53M

BENDING TEST (COLD) FOR NPS 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	12 x outside pipe diameter
Close Coiling	90°	8 x outside pipe diameter

FLATTENING TEST - NPS 2-1/2 and GREATER

As a test for quality of the weld, position the weld at 90° from the direction of force and flatten until the OD is 3/4 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

DIMENSIONS and WEIGHTS

BLACK PLAIN END					
Nominal Size	OD Inches	Sch. 40		Sch. 80	
		Wall Inches	Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.
1/8"	0.405	0.068	0.24	0	0.31
1/4"	0.540	0.088	0.43	0.119	0.54
3/8"	0.675	0.091	0.57	0.126	0.74
1/2"	0.840	0.109	0.85	0.147	1.09
3/4"	1.050	0.113	1.13	0.154	1.48
1"	1.315	0.133	1.68	0.179	2.17
1-1/4"	1.660	0.140	2.27	0.191	3
1-1/2"	1.900	0.145	2.72	0.2	3.63
2"	2.375	0.154	3.66	0.218	5.03
2-1/2"	2.875	0.203	5.8.0	0.276	7.67
3"	3.500	0.216	7.58	0.3	10.26
3-1/2"	4.000	0.226	9.12	0.318	12.52
4"	4.500	0.237	10.8	0.337	15

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

NPS 1-1/2 and under + .016"

NPS 2 and over + 1%

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than + 10% from the standard specified.

PRODUCT MARKING

Each length of pipe 1/2 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A 53), the kind of pipe (F for Continuous Weld, A for Grade A,) the size (Sch 80 for extra strong), and length. Stencil markings indicate UL Listing and FM Approval for sizes 1" through 6" nominal for use in Fire Sprinkler Pipe Applications. Bar Coding is acceptable as a supplementary identification method.