



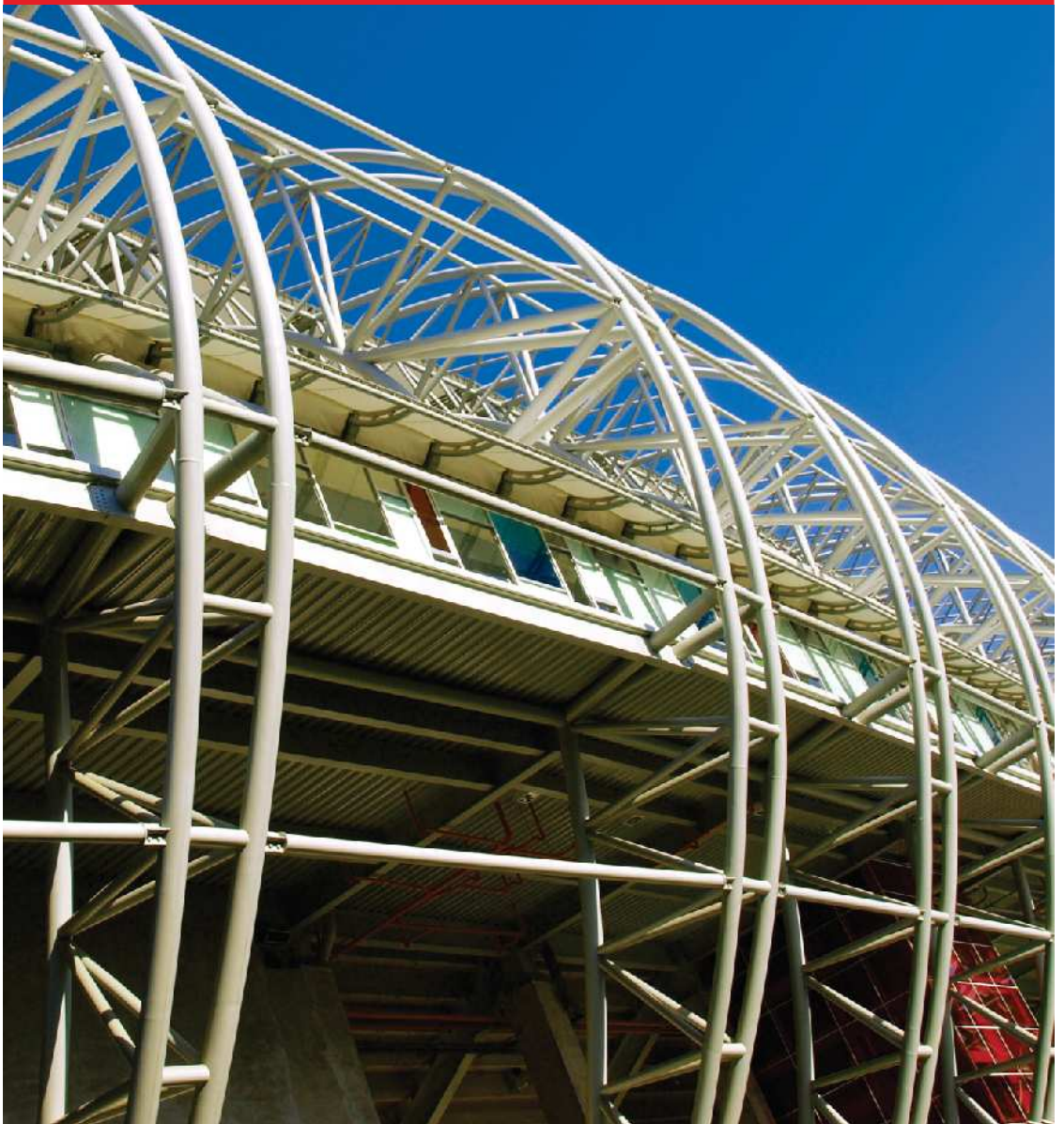
**SSAW & HFW**


Spiral Submerged Arc Welded  
High Frequency Welded

**Structural  
Pipes**



PT Steel Pipe Industry of Indonesia, Tbk.





We offer various types of structural pipes, which are offered in different sizes, cross sections, chemical compositions and dimensions. All our products conform to Indonesian National Standard (SNI) and international quality standards ASTM and JIS. Our range of structural pipes are known for their superior strength, close tolerance, excellent corrosion resistance and smooth finishing. We can offer complex and intricate structural pipes, which can be large or very small in size. Although the shapes and sizes are kept standardized, a number of specialist profiles can be manufactured to suit the requirements of the customers.

**Industrial Standards**

**SNI 8052 | SNI 0068 | JIS G3444 | ASTM A53 | ASTM A252**



### Column

Building Construction



### Piling

Foundation Work



# HFW Structural Pipes

Range of Diameter	¼" - 8"
Range of Wall Thickness	according to standard
Classification	Kelas 1   Kelas 2   Kelas 3 - <b>SNI 8052</b>
	PKB 30   PKB 41 - <b>SNI 0068</b>
	STK 290   STK 400 - <b>JIS G3444</b>
	Grade A   Grade B - <b>ASTM A53</b>
	Grade 1   2   3 - <b>ASTM A252</b>

## HFW Structural Pipes

SPINDO® High Frequency Welded (HFW) steel pipe can be found in bridges, construction projects especially for wide-spans building : airport, stadium, hall, etc also structural casing applications. We have been serving various projects, from giant construction state-owned and overseas to local private projects with general contractors.

Pipa baja HFW SPINDO® telah digunakan pada beberapa proyek jembatan, proyek konstruksi terutama untuk bangunan bentang lebar: bandara, stadion, aula, dll serta aplikasi struktural selubung bangunan. Kami telah melayani ragam proyek, mulai dari proyek konstruksi raksasa milik pemerintah dan proyek luar negeri hingga proyek-proyek swasta lokal dengan kontraktor umum.

# SSAW Structural Pipes

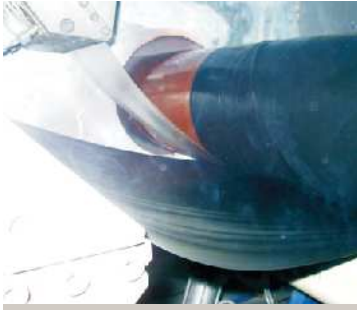
Range of Diameter	6" - 120"
Range of Wall Thickness	according to standard
Classification	Kelas 1   Kelas 2   Kelas 3 - <b>SNI 8052</b> Grade 1   2   3 - <b>ASTM A252</b>

## SSAW Structural Pipes

SPINDO® Spiral Submerged Arc Welded (SSAW) steel pipe is ideal for use in structural applications, such as foundation work (pile casing or piling) and in wharf, bridge and building construction projects. It offers major advantages over alternative materials as the spiral forming process produces accurately manufactured pipe that makes the product easy to use and, combined with high quality welding and testing, ensures enduring dependability.

Pipa baja SSAW SPINDO® sangat ideal untuk digunakan pada berbagai aplikasi struktural, seperti pekerjaan pondasi (tiang pancang atau pembungkus tiang pancang) dan di dermaga, jembatan dan konstruksi bangunan proyek. Pipa baja SPINDO® sangat bermanfaat sebagai bahan alternatif konstruksi karena proses manufaktur pembentukan pipa spiral yang akurat membuat produk yang mudah digunakan, serta dikombinasikan dengan pengelasan berkualitas tinggi dan uji produk untuk memastikan kehandalan.

# External Coating



Three Layer Polyethylene (3LPE)



Three Layer Polypropelene (3LPP)



Fusion Bond Epoxy Coating (FBE)



External Epoxy Coating

# Galvanized



**Spiral Pipe** Manufacturing Process  
Diameter width : 3.2 m

**Spiral Pipe** Manufacturing Process  
Length : 72 m, without connection



Application : **Construction Pile**  
PSE JETTY - Tanjungbara Sangata Kutai,  
East Kalimantan by Mc Connel Dowell

Application : **Construction Column**  
Juanda International Airport, Surabaya





## CARBON STEEL PIPES FOR GENERAL APPLICATIONS

### ASTM A53 : 2020 | GRADE A / GRADE B

#### Chemical Composition (% Max.) :

ASTM A-53	Carbon	Manganese	Phosphorus	Sulfur	Copper	Nickel	Chromium	Molibdenum	Vanadium	Cu+Ni+Cr+Mo+V
Grade A	0.25	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08	1.00
Grade B	0.30	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08	1.00

#### Wall Thickness Tolerance

The minimum wall thickness shall be not more than 12.5% under the specified wall thickness.

#### Tensile Requirements

	Grade A	Grade B
Tensile strength, min, psi [Mpa]	48.000 [330]	60.000 [415]
Yield strength, min, psi [Mpa]	30.000 [205]	35.000 [240]
Elongation in 2 in. or 50 mm	A, B	A, B

#### Galvanized

##### Zinc Coating Weight

550 gr/m<sup>2</sup> (77µm)

##### Outside Diameter (OD) Tolerance

OD ≤ 1½ inch = ±0.40 mm from the specified OD  
 OD ≥ 2 inch = ±1% mm from the specified OD

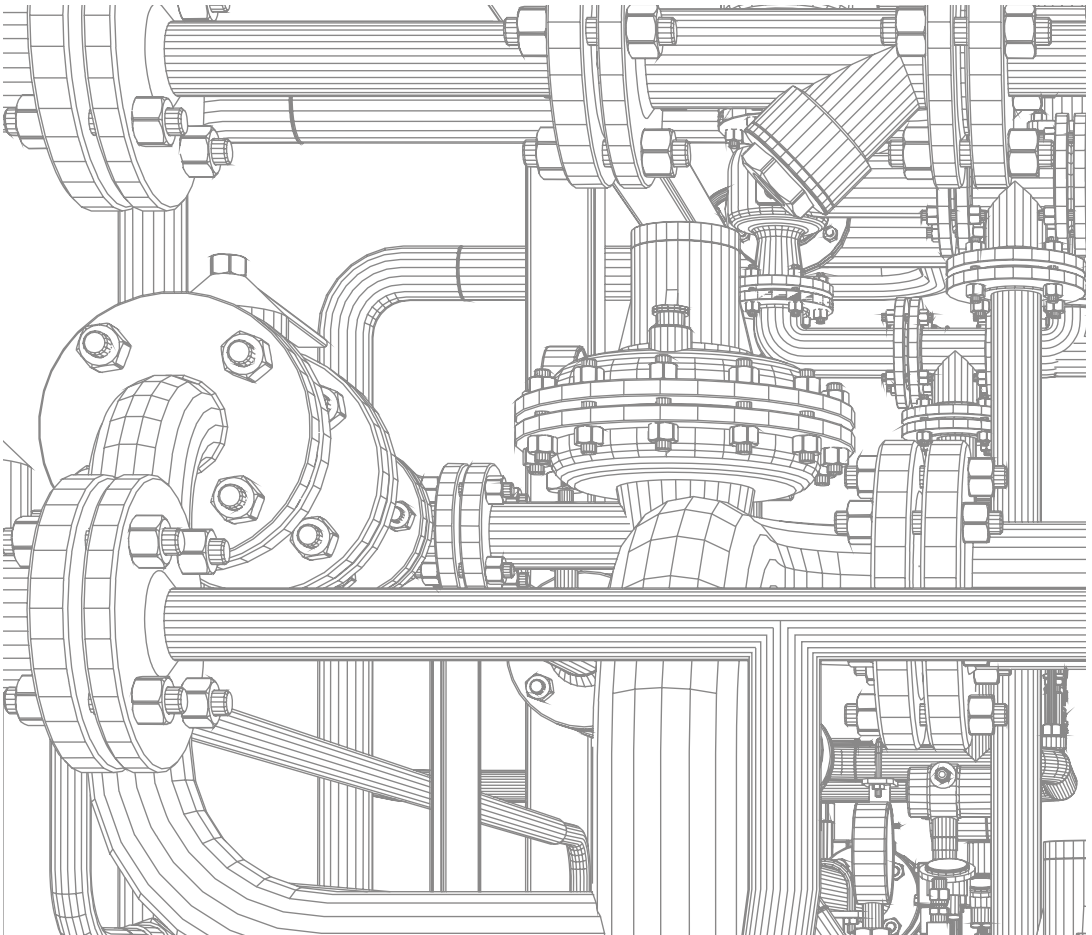
NOMINAL SIZE	OUTSIDE DIAMETER		WALL THICKNESS		WEIGHT CLASS	SCH NO.	WEIGHT PLAIN END	TEST PRESSURE psi [kPa]	
	inch	mm	inch	mm				Grade A	Grade B
½	0.840	21.3	0.109	2.77	STD	40	1.27	700 [4800]	700 [4800]
			0.147	3.73	XS	80	1.62	850 [5900]	850 [5900]
¾	1.050	26.7	1.113	2.87	STD	40	1.69	700 [4800]	700 [4800]
			1.154	3.91	XS	80	2.20	850 [5900]	850 [5900]
1	1.315	33.4	0.133	3.38	STD	40	2.50	700 [4800]	700 [4800]
			0.179	4.55	XS	80	3.24	850 [5900]	850 [5900]
1¼	1.660	42.2	0.140	3.56	STD	40	3.39	1200 [8300]	1300 [9000]
			0.191	4.85	XS	80	4.47	1800 [12 400]	1900 [13 100]
1½	1.900	48.3	0.145	3.68	STD	40	4.05	1200 [8300]	1300 [9000]
			0.200	5.08	XS	80	5.41	1800 [12 400]	1900 [13 100]
2	2.375	60.3	0.154	3.91	STD	40	5.44	2300 [15 900]	2500 [17 200]
			0.218	5.54	XS	80	7.48	2500 [17 200]	2500 [17 200]
2½	2.875	73.0	0.203	5.16	STD	40	8.63	2500 [17 200]	2500 [17 200]
			0.276	7.01	XS	80	11.41	2500 [17 200]	2500 [17 200]
3	3.500	88.9	0.216	5.49	STD	40	11.29	2220 [15 300]	2500 [17 200]
3½	4.000	101.6	0.226	5.74	STD	40	13.57	2030 [14 000]	2370 [16 300]
4	4.500	114.3	0.237	6.02	STD	40	16.07	1900 [13 100]	2210 [15 200]
5	5.563	141.3	0.258	6.55	STD	40	21.77	1670 [11 500]	1950 [13 400]
6	6.625	168.3	0.280	7.11	STD	40	28.26	1520 [10 500]	1780 [12 300]
8	8.625	219.1	0.250	6.35	***	20	33.31	1040 [7200]	1220 [8400]
			0.277	7.04	***	30	36.31	1160 [7800]	1350 [9300]
			0.322	8.18	STD	40	42.55	1340 [9200]	1570 [10 800]

## WELDED STEEL PIPE PILES | ASTM A 252 (2019)

GRADE	TENSILE STRENGTH	YIELD STRENGTH
	<i>psi (MPa)</i>	<i>psi (MPa)</i>
1	50 000 (345)	30 000 (205)
2	60 000 (415)	35 000 (240)
3	66 000 (455)	45 000 (310)

OUTSIDE DIAMETER	NOMINAL WALL THICKNESS	WEIGHT per UNIT LENGTHS
<i>inch</i>	<i>in.<sup>B</sup></i>	<i>lb/ft<sup>C</sup></i>
6	0.134	8.40
	0.141	8.83
	0.156	9.75
	0.164	10.23
	0.172	10.72
8	0.141	11.85
	0.172	14.39

OUTSIDE DIAMETER	NOMINAL WALL THICKNESS	WEIGHT per UNIT LENGTHS
<i>inch</i>	<i>in.<sup>B</sup></i>	<i>lb/ft<sup>C</sup></i>
8 5/8	0.109	9.92
	0.141	12.79
	0.172	15.54
	0.188	16.96
	0.203	18.28
	0.219	19.68
	0.250	22.38
	0.277	24.72
	0.312	27.73
	0.322	28.58
	0.344	30.45
10	0.375	33.07
	0.438	38.33
	0.500	43.43



**PIPA BAJA UNTUK PANCANG | SNI 8052 : 2014**

**SIFAT MEKANIK PIPA BAJA UNTUK PANCANG**

		Kelas 1	Kelas 2	Kelas 3
Kuat Tarik	MPa	345	415	455
	psi	(50000)	(60000)	(66000)
Kuat Luluh	MPa	205	240	310
	psi	(30000)	(35000)	(45000)
Nilai regangan (elongasi) minimum untuk tebal nominal pipa 7,9 mm (5/16 inch) atau lebih: - Nilai regangan pada panjang ukur 50,8 mm (2 inch), % - Nilai regangan pada panjang ukur 203,2 mm (8 inch),%		30 18	25 14	20 -
Untuk tebal nominal pipa kurang dari 7,9 mm (5/16 inch), dasar pengurangan nilai regangan minimum pada panjang ukur 50,8 mm (2 inch) untuk setiap 0,8 mm (1/32 inch),%		1,50 <sup>A</sup>	1,25 <sup>A</sup>	1,0 <sup>A</sup>

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
2	60.3	2 <sup>3</sup> / <sub>8</sub>	3.90	5.44
2½	73.0	2 <sup>7</sup> / <sub>8</sub>	3.90	6.65
3	88.9	3½	5.49	11.29
4	114.3	4½	6.02	16.07
6	168.3	6 <sup>5</sup> / <sub>8</sub>	3.40	13.83
			3.58	14.54
			3.96	16.05
			4.17	16.88
			4.37	17.67
			4.55	18.37
			4.78	19.27
			5.16	20.76
			5.56	22.31
			5.84	23.40
			6.35	25.36
			7.11	28.26
			8.18	32.30
			9.00	35.36
			9.27	36.35
			9.53	37.31

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
8	219.1	8 <sup>5</sup> / <sub>8</sub>	4.78	25.26
			5.16	27.22
			5.56	29.28
			6.35	33.31
			7.11	37.17
			7.92	41.24
			8.18	42.55
			8.74	45.34
			9.00	46.63
			9.27	47.97
			9.53	49.25
			10.11	52.10
			11.13	57.08
			12.70	64.64

CARBON STEEL TUBES FOR GENERAL STRUCTURE | JIS G 3444 (STK) : 2010 / SNI 0068 (PKB) : 2013

SYMBOL OF GRADE		TENSILE STRENGTH (N/mm <sup>2</sup> )		YIELD STRENGTH (N/mm <sup>2</sup> )
SNI 0068	JIS G 3444	SNI 0068	JIS G 3444	
PKB 30	STK 290	294 Min	290 Min	-
PKB 41	STK 400	402 Min	400 Min	235 Min

NOMINAL DIAMETER		OUTSIDE DIAMETER	WALL THICKNESS	UNIT MASS
<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>mm</i>	<i>kg/m</i>
15	½	21.7	2.0	0.972
20	¾	27.2	2.0	1.24
			2.3	1.41
25	1	34.0	2.3	1.80
			2.3	2.29
32	1¼	42.7	2.5	2.48
			2.3	2.63
40	1½	48.6	2.5	2.84
			2.8	3.16
			3.2	3.58
			2.3	3.30
50	2	60.5	3.2	4.52
			4.0	5.57
			2.8	5.08
			3.2	5.77
65	2½	76.3	4.0	7.13
			2.8	5.96
			3.2	6.78
			4.0	7.76
80	3	89.1	4.0	9.63
			5.0	11.9
			3.2	8.77
			3.5	9.56
100	4	114.3	4.5	12.2
			3.6	12.1
			4.0	13.4
			4.5	15.0
125	5	139.8	6.0	19.8
			4.5	17.8
			5.0	19.8
			6.0	23.6
150	6	165.2	7.1	27.7
			4.5	20.7
			5.3	24.2
			6.0	27.3
175	7	190.7	7.0	31.7
			8.2	36.9
			4.5	23.5
			5.8	30.1
200	8	216.3	6.0	31.1
			7.0	36.1
			8.0	41.1
			8.2	42.1

SIFAT MEKANIK PIPA BAJA UNTUK PANCANG

		Kelas 1	Kelas 2	Kelas 3
Kuat Tarik	MPa psi	345 ( 50000 )	415 ( 60000 )	455 ( 66000 )
Kuat Luluh	MPa psi	205 ( 30000 )	240 ( 35000 )	310 ( 45000 )
Nilai regangan (elongasi) minimum untuk tebal nominal pipa 7,9 mm ( 5/16 inch ) atau lebih: - Nilai regangan pada panjang ukur 50,8 mm ( 2 inch ), % - Nilai regangan pada panjang ukur 203,2 mm ( 8 inch ),%		30 18	25 14	20 -
Untuk tebal nominal pipa kurang dari 7,9 mm ( 5/16 inch ), dasar pengurangan nilai regangan minimum pada panjang ukur 50,8 mm ( 2 inch ) untuk setiap 0,8 mm ( 1/32 inch ),%		1,50 <sup>A</sup>	1,25 <sup>A</sup>	1,0 <sup>A</sup>

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
6	168.3	6 <sup>5/8</sup>	6.35	25.36
			7.11	28.26
			8.18	32.30
			9.00	35.36
			9.53	37.31
8	219.1	8 <sup>5/8</sup>	6.35	33.31
			7.11	37.17
			7.92	41.24
			8.18	42.55
			8.74	45.34
			9.00	46.63
10	273.05	10 <sup>3/4</sup>	9.27	47.97
			9.53	49.25
			6.35	41.76
			7.11	46.63
			7.80	51.02

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
10	273.05	10 <sup>3/4</sup>	7.92	51.78
			8.18	53.43
			8.38	54.69
			8.74	56.97
			9.00	58.60
			9.27	60.30
			9.53	61.93
12	323.9	12 <sup>3/4</sup>	10.11	65.55
			10.31	66.80
			11.13	71.89
			6.35	49.73
			7.11	55.54
			7.80	60.80
			7.92	61.71
			8.18	63.69
			8.38	65.20

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
12	323.9	12¾	8.74	67.93
			9.00	69.89
			9.27	71.92
			9.53	73.88
			10.11	78.23
			10.31	79.73
14	355.6	14	11.13	85.84
			6.35	54.69
			7.11	61.10
			7.80	66.90
			7.92	67.90
			8.18	70.08
			8.38	71.75
			8.74	74.76
			9.00	76.92
			9.27	79.17
			9.53	81.33
			10.11	86.14
16	406.4	16	6.35	62.64
			7.11	70.01
			7.80	76.67
			7.92	77.83
			8.18	80.33
			8.38	82.25
			8.74	85.71
			9.00	88.20
			9.27	90.78
			9.53	93.27
			10.11	98.80
			10.31	100.70
18	457.2	18	6.35	70.60
			7.11	78.92
			7.80	86.44

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
18	457.2	18	7.92	87.75
			8.18	90.58
			8.38	92.75
			8.74	96.66
			9.00	99.47
			9.27	102.40
			9.53	105.21
			10.11	111.47
			10.31	113.62
			11.31	122.43
20	508	20	12.00	131.74
			12.70	139.21
			6.35	78.55
			7.11	87.82
			7.80	96.21
			7.92	97.67
			8.18	100.82
			8.38	103.25
22	558.8	22	8.74	107.60
			9.00	110.75
			9.27	114.01
			9.53	117.15
			10.11	124.13
			10.31	126.53
			11.13	136.37
			12.00	146.78
			12.70	155.12
			13.00	158.69
22	558.8	22	14.13	172.09
			14.27	173.74
			6.35	86.51
			7.11	96.73
			7.80	105.98
			7.92	107.59
22	558.8	22	8.18	111.07
			8.38	113.74
			8.74	118.55
			9.00	122.02

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
22	558.8	22	9.27	125.62
			9.53	129.08
			10.11	136.80
			10.31	139.45
			11.13	150.32
			12.00	161.81
			12.70	171.03
			13.00	174.97
			14.13	189.79
			14.27	191.62
24	609.6	24	9.50	140.59
			10.30	152.22
			11.10	163.83
			11.90	175.40
			12.70	186.94
			14.30	209.93
			15.90	232.79
			17.50	255.52
			19.10	278.13
			20.60	299.21
26	660.4	26	9.50	152.49
			10.30	165.12
			11.10	177.73
			11.90	190.30
			12.70	202.85
			14.30	227.84
28	711.2	28	9.50	164.39
			10.30	178.03
			11.10	191.64
			10.90	205.21

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
28	711.2	28	12.70	218.76
			14.30	245.75
			15.90	272.62
30	762	30	9.50	176.29
			10.30	190.93
			11.10	205.54
			11.90	220.12
			12.70	234.67
32	812.8	32	10.30	203.83
			11.10	219.45
			11.90	235.03
			12.70	250.58
			14.30	281.58
			15.90	312.46
			17.50	343.21
34	863.6	34	10.30	216.74
			11.10	233.35
			11.90	249.93
			12.70	266.49
			14.30	299.50
			15.90	332.38
36	914.4	36	11.10	247.26
			11.90	264.84
			12.70	282.40
			14.30	317.41
			15.90	352.30
38	965.2	38	11.10	261.16

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
38	965.2	38	11.90	279.75
			12.70	298.31
			14.30	335.32
			15.90	372.21
			17.50	408.98
			19.10	445.62
			20.60	479.85
			22.20	516.25
40	1016	40	11.10	275.07
			11.90	294.66
			12.70	314.22
			14.30	353.24
			15.90	392.13
			17.50	430.90
			19.10	469.55
			20.60	505.66
42	1067	42	11.10	289.03
			11.90	309.62
			12.70	330.19
			14.30	371.22
			15.90	412.13
			17.50	452.91
			19.10	493.57
			20.60	531.57
44	1118	44	11.10	302.99
			11.90	324.59
			12.70	346.16
			14.30	389.21
			15.90	432.13
			17.50	474.92
			19.10	517.59
			20.60	557.47
46	1168	46	7.90	226.00
			8.70	248.72
			9.50	271.40

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
46	1168	46	10.30	294.05
			11.10	316.67
			11.90	339.26
			12.70	361.82
			14.30	406.84
			15.90	451.73
			17.50	496.50
			19.10	541.14
48	1219	48	20.60	582.87
			22.20	627.27
			11.10	330.63
			11.90	354.23
			12.70	337.79
			14.30	424.82
			15.90	471.73
			17.50	518.51
50	1270	50	19.10	565.16
			20.60	608.78
			22.20	655.19
			23.80	701.47
			12.00	372.27
			14.00	433.62
			16.00	494.78
			19.00	586.14
52	1320.8	52	20.00	616.50
			22.00	677.06
			25.00	767.54
			12.00	387.30
			14.00	451.16
			16.00	514.82
			19.00	609.95
			20.00	641.55
53	1346.2	53	22.00	704.62
			25.00	798.86
			12.00	394.82
			14.00	459.93
			16.00	524.84
			19.00	621.85

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
53	1346.2	53	20.00	654.08
			22.00	718.40
			25.00	814.52
54	1371.6	54	12.00	402.33
			14.00	468.70
			16.00	534.87
			19.00	633.75
			20.00	666.61
			22.00	732.18
			25.00	830.18
56	1422.4	56	12.00	417.37
			14.00	486.24
			16.00	554.91
			19.00	657.55
			20.00	691.66
			22.00	759.75
			25.00	861.50
58	1473.2	58	12.00	432.40
			14.00	503.77
			16.00	574.95
			19.00	681.35
			20.00	716.72
			22.00	787.31

NOMINAL DIAMETER	OUTSIDE DIAMETER		WALL THICKNESS	WEIGHT PER UNIT LENGTHS
	mm	inch		
58	1473.2	58	25.00	892.82
			12.00	439.91
59	1498.6	59	14.00	512.54
			16.00	584.97
			19.00	693.25
			20.00	729.25
			22.00	801.09
			25.00	908.47
62	1574.8	62	12.00	462.46
			14.00	538.85
			16.00	615.04
			19.00	728.95
			20.00	766.83
			22.00	842.43
64	1625.6	64	25.00	955.45
			12.00	477.50
			14.00	556.39
			16.00	635.08
			19.00	752.76
			20.00	791.88
			22.00	869.99
			25.00	986.77

For other standard pipe: custom thicknesses, length, and diameter size are also available. Please contact us for more information.

# GRADE TABLE | ASTM A 252 : 2019

GRADE	TENSILE STRENGTH psi (MPa)	YIELD STRENGTH psi (MPa)
1	50,000 (345)	30,000 (205)
2	60,000 (415)	35,000 (240)
3	66,000 (455)	45,000 (310)

## STANDARD SPECIFICATION FOR WELDED PIPE PILES | ASTM A 252 : 2019

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
6.625	168.28	0.250	6.35	0.219	5.56	17.038	25.356
		0.280	7.11	0.245	6.22	18.993	28.265
		0.312	7.92	0.273	6.93	21.057	31.337
		0.344	8.74	0.301	7.65	23.099	34.375
		0.375	9.53	0.328	8.33	25.057	37.288
8.00	203.20	0.250	6.35	0.219	5.56	20.713	30.825
		0.280	7.11	0.245	6.22	23.109	34.390
		0.312	7.92	0.273	6.93	25.644	38.162
		0.344	8.74	0.310	7.65	28.156	41.901
		0.375	9.53	0.328	8.33	30.569	45.492
8.625	219.08	0.250	6.35	0.219	5.56	22.384	33.311
		0.277	7.04	0.242	6.16	24.721	36.789
		0.312	7.92	0.273	6.93	27.728	41.264
		0.322	8.18	0.282	7.16	28.583	42.535
		0.344	8.74	0.301	7.65	30.454	45.321
10.00	254.00	0.250	6.35	0.219	5.56	26.059	38.780
		0.279	7.09	0.244	6.20	28.995	43.149
		0.307	7.80	0.269	6.82	31.813	47.343
		0.344	8.74	0.301	7.65	35.511	52.846
		0.365	9.27	0.319	8.11	37.597	55.951
10.75	273.05	0.250	6.35	0.219	5.56	28.063	41.763
		0.279	7.09	0.244	6.20	31.232	46.479
		0.307	7.80	0.269	6.82	34.275	51.006
		0.344	8.74	0.301	7.65	38.269	56.951
		0.365	9.27	0.319	8.11	40.524	60.306
12.00	304.80	0.250	6.35	0.219	5.56	31.404	46.735
		0.281	7.14	0.246	6.25	35.205	52.391
		0.312	7.92	0.273	6.93	38.986	58.017
		0.330	8.38	0.289	7.33	41.171	61.270
		0.344	8.74	0.301	7.65	42.866	63.792
12.75	323.85	0.375	9.53	0.328	8.33	46.605	69.356
		0.406	10.31	0.355	9.02	50.323	74.889
		0.438	11.31	0.383	9.73	54.140	80.569
		0.250	6.35	0.219	5.56	33.409	49.718
		0.281	7.14	0.246	6.25	37.458	55.744
14.00	355.60	0.312	7.92	0.273	6.93	41.487	61.740
		0.330	8.38	0.289	7.33	43.817	65.207
		0.344	8.74	0.301	7.65	45.625	67.897
		0.375	9.53	0.328	8.33	49.612	73.831
		0.438	11.31	0.383	9.73	57.652	85.795
14.00	355.60	0.250	6.35	0.219	5.56	36.750	54.689
		0.281	7.14	0.246	6.25	41.213	61.332
		0.312	7.92	0.273	6.93	45.657	67.945
		0.344	8.74	0.301	7.65	50.222	74.738
		0.375	9.53	0.328	8.33	54.623	81.288
14.00	355.60	0.438	11.31	0.383	9.73	63.505	94.506
		0.469	11.91	0.410	10.42	67.844	100.963

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
16.00	406.40	0.250	6.35	0.219	5.56	42.095	62.644
		0.281	7.14	0.246	6.25	47.222	70.274
		0.312	7.92	0.273	6.93	52.328	77.872
		0.344	8.74	0.301	7.65	57.577	85.684
		0.375	9.53	0.328	8.33	62.641	93.221
		0.438	11.13	0.383	9.73	72.870	108.443
		0.469	11.91	0.410	10.42	77.872	115.886
		0.500	12.70	0.438	11.11	82.854	123.300
18.00	457.20	0.250	6.35	0.219	5.56	47.440	70.599
		0.281	7.14	0.246	6.25	53.230	79.215
		0.312	7.92	0.273	6.93	58.999	87.800
		0.344	8.74	0.301	7.65	64.932	96.630
		0.375	9.53	0.328	8.33	70.659	105.153
		0.406	10.31	0.355	9.02	76.366	113.645
		0.438	11.31	0.383	9.73	82.235	122.379
		0.469	11.91	0.410	10.42	87.900	130.810
20.00	508.00	0.312	7.92	0.273	6.93	65.670	97.727
		0.344	8.74	0.301	7.65	72.288	107.576
		0.375	9.53	0.328	8.33	78.678	117.085
		0.438	11.13	0.383	9.73	91.600	136.316
		0.469	11.91	0.410	10.42	97.928	145.733
		0.500	12.70	0.438	11.11	104.235	155.119
		0.562	14.27	0.492	12.49	116.788	173.799
		22.00	558.80	0.312	7.92	0.273	6.93
0.375	9.53			0.328	8.33	86.696	129.017
0.438	11.13			0.383	9.73	100.965	150.253
0.469	11.91			0.410	10.42	107.956	160.656
0.500	12.70			0.438	11.11	114.926	171.029
0.562	14.27			0.492	12.49	128.804	191.682
24.00	609.60	0.375	9.53	0.328	8.33	94.714	140.950
		0.438	11.13	0.383	9.73	110.331	164.190
		0.469	11.91	0.410	10.42	117.984	175.579
		0.500	12.70	0.483	11.11	125.617	186.938
		0.562	14.27	0.492	12.49	140.821	209.564
26.00	660.40	0.375	9.53	0.328	8.33	102.732	152.882
		0.406	10.31	0.355	9.02	111.090	165.320
		0.438	11.13	0.383	9.73	119.696	178.127
		0.469	11.91	0.410	10.42	128.012	190.503
		0.500	12.70	0.438	11.11	136.308	202.848
		0.562	14.27	0.492	12.49	152.837	227.447
28.00	711.20	0.375	9.53	0.328	8.33	110.750	164.814
		0.406	10.31	0.355	9.02	119.771	178.238
		0.438	11.13	0.383	9.73	129.061	192.064
		0.469	11.91	0.410	10.42	138.040	205.426
		0.500	12.70	0.438	11.11	146.998	218.756
		0.562	14.27	0.492	12.49	164.854	245.329
		0.625	15.88	0.547	13.89	182.913	272.204
30.00	762.00	0.375	9.53	0.328	8.33	118.768	176.746
		0.406	10.31	0.355	9.02	128.452	191.157

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
		0.438	11.31	0.383	9.73	138.426	206.001
		0.469	11.91	0.410	10.42	148.068	220.349
		0.500	12.70	0.438	11.11	157.689	234.667
		0.562	14.27	0.492	12.49	176.870	263.212
		0.625	15.88	0.547	13.89	196.276	292.091
32.00	812.80	0.406	10.31	0.355	9.02	137.133	204.076
		0.438	11.13	0.383	9.73	147.791	219.937
		0.469	11.91	0.410	10.42	158.096	235.272
		0.500	12.70	0.438	11.11	168.380	250.577
		0.562	14.27	0.492	12.49	188.887	281.094
		0.625	15.88	0.547	13.89	209.640	311.978
		0.688	17.48	0.602	15.29	230.308	344.736
		0.750	19.05	0.656	16.67	250.565	372.882
		0.812	20.62	0.711	18.05	270.741	402.906
34.00	863.60	0.406	10.31	0.355	9.02	145.813	216.994
		0.438	11.13	0.383	9.73	157.156	233.874
		0.469	11.91	0.410	10.42	168.124	250.196
		0.500	12.70	0.438	11.11	179.071	266.487
		0.562	14.27	0.492	12.49	200.903	298.977
		0.625	15.88	0.547	13.89	223.003	331.865
		0.688	17.48	0.602	15.29	245.019	364.628
		0.750	19.05	0.656	16.67	266.602	396.747
		0.812	20.62	0.711	18.09	288.102	428.744
36.00	914.40	0.438	11.13	0.383	9.73	166.521	247.811
		0.469	11.91	0.410	10.42	178.152	265.119
		0.500	12.70	0.438	11.11	189.762	282.396
		0.562	14.27	0.492	12.49	212.919	316.859
		0.625	15.88	0.547	13.89	236.367	351.752
		0.688	17.48	0.602	15.29	259.729	386.519
		0.750	19.05	0.656	16.67	282.638	420.611
		0.812	20.62	0.711	18.05	305.464	454.581
		0.875	22.23	0.766	19.45	328.575	488.973
38.00	965.20	0.438	11.13	0.383	9.73	175.887	261.748
		0.469	11.91	0.410	10.42	188.180	280.042
		0.500	12.70	0.438	11.11	200.452	298.306
		0.562	14.27	0.492	12.49	224.936	334.741
		0.625	15.88	0.547	13.89	249.730	371.639
		0.688	17.48	0.602	15.29	274.440	408.411
		0.750	19.05	0.656	16.67	298.674	444.476
		0.812	20.62	0.711	18.05	322.826	480.418
		0.875	22.23	0.766	19.45	347.284	516.815
40.00	1016.00	0.438	11.13	0.383	9.73	185.252	275.685
		0.469	11.91	0.410	10.42	198.208	294.965
		0.500	12.70	0.438	11.11	211.143	314.216
		0.562	14.27	0.492	12.49	236.952	352.624
		0.625	15.88	0.547	13.89	263.094	391.526
		0.688	17.48	0.602	15.29	289.150	430.303
		0.750	19.05	0.656	16.67	314.710	468.340
		0.812	20.62	0.711	18.05	340.188	506.255
		0.875	22.23	0.766	19.45	365.993	544.657

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
42.00	1066.80	0.438	11.13	0.383	9.73	194.617	289.622
		0.469	11.91	0.410	10.42	208.236	309.889
		0.500	12.70	0.438	11.11	221.834	330.125
		0.562	14.27	0.492	12.49	248.969	370.506
		0.625	15.88	0.547	13.89	276.457	411.413
		0.688	17.48	0.602	15.29	303.861	452.194
		0.750	19.05	0.656	16.67	330.746	492.205
		0.812	20.62	0.711	18.05	357.550	532.093
		0.875	22.23	0.766	19.45	384.701	572.499
44.00	1117.60	0.438	11.13	0.383	9.73	203.982	303.559
		0.469	11.91	0.410	10.42	218.264	324.812
		0.500	12.70	0.438	11.11	232.525	346.035
		0.562	14.27	0.492	12.49	260.985	388.389
		0.625	15.88	0.547	13.89	289.821	431.301
		0.688	17.48	0.602	15.29	318.571	474.086
		0.750	19.05	0.656	16.67	346.782	516.069
		0.812	20.62	0.711	18.05	374.912	577.930
46.00	1168.40	0.875	22.23	0.766	19.45	403.410	600.341
		0.438	11.13	0.383	9.73	213.347	317.495
		0.469	11.91	0.410	10.42	228.292	339.735
		0.500	12.70	0.438	11.11	243.215	361.944
		0.562	14.27	0.492	12.49	273.002	406.271
		0.625	15.88	0.547	13.89	303.184	451.188
		0.688	17.48	0.602	15.29	333.282	495.978
		0.750	19.05	0.656	16.67	362.819	539.934
		0.812	20.62	0.711	18.05	392.273	583.767
		0.875	22.23	0.766	19.45	422.119	628.182
48.00	1219.20	0.438	11.13	0.383	9.73	222.712	331.432
		0.469	11.91	0.410	10.42	238.320	354.658
		0.500	12.70	0.438	11.11	253.906	377.854
		0.562	14.27	0.492	12.49	285.018	424.154
		0.625	15.88	0.547	13.89	316.548	471.075
		0.688	17.48	0.602	15.29	347.992	517.869
		0.750	19.05	0.656	16.67	378.855	563.798
		0.812	20.62	0.711	18.05	409.635	609.604
		0.875	22.23	0.766	19.45	440.828	656.024
		0.938	23.83	0.821	20.85	471.936	702.318
52.00	1320.80	0.438	11.13	0.383	9.73	241.442	359.306
		0.469	11.91	0.410	10.42	258.375	384.505
		0.500	12.70	0.438	11.11	275.288	409.673
		0.562	14.27	0.492	12.49	309.051	459.919
		0.625	15.88	0.547	13.89	343.275	510.849
		0.688	17.48	0.602	15.29	377.412	561.653
		0.750	19.05	0.656	16.67	410.927	611.527
		0.812	20.62	0.711	18.05	444.359	661.279
		0.875	22.23	0.766	19.45	478.246	711.708
		0.938	23.83	0.821	20.85	512.048	762.011
56.00	1422.40	0.438	11.13	0.383	9.73	260.173	387.180
		0.469	11.91	0.410	10.42	278.431	414.351
		0.500	12.70	0.438	11.11	296.669	441.493

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
		0.562	14.27	0.492	12.49	333.084	495.683
		0.625	15.88	0.547	13.89	370.002	550.623
		0.688	17.48	0.602	15.29	406.834	605.436
		0.750	19.05	0.656	16.67	443.000	659.256
		0.812	20.62	0.711	18.05	479.083	712.953
		0.875	22.23	0.766	19.45	515.664	767.392
		0.938	23.83	0.821	20.85	552.160	821.704
60.00	1524.00	0.438	11.13	0.383	9.73	278.903	415.053
		0.469	11.91	0.410	10.42	298.487	444.198
		0.500	12.70	0.438	11.11	318.051	473.312
		0.562	14.27	0.492	12.49	357.117	531.448
		0.625	15.88	0.547	13.89	396.729	590.397
		0.688	17.48	0.602	15.29	436.255	649.219
		0.750	19.05	0.656	16.67	475.072	706.985
		0.812	20.62	0.711	18.05	513.806	764.628
		0.875	22.23	0.766	19.45	553.081	823.076
		0.938	23.83	0.821	20.85	592.271	881.397
64.00	1625.60	0.438	11.13	0.383	9.73	297.633	442.927
		0.469	11.91	0.410	10.42	318.543	474.044
		0.500	12.70	0.438	11.11	339.433	505.131
		0.562	14.27	0.492	12.49	381.150	567.213
		0.625	15.88	0.547	13.89	423.455	630.171
		0.688	17.48	0.602	15.29	465.676	693.003
		0.750	19.05	0.656	16.67	507.144	754.714
		0.812	20.62	0.711	18.05	548.530	816.303
		0.875	22.23	0.766	19.45	590.499	878.759
		0.938	23.83	0.821	20.85	632.383	941.090
68.00	1727.20	0.469	11.91	0.410	10.42	338.599	503.891
		0.500	12.70	0.438	11.11	360.814	536.951
		0.562	14.27	0.492	12.49	405.183	602.978
		0.625	15.88	0.547	13.89	450.182	669.945
		0.688	17.48	0.602	15.29	495.097	736.786
		0.750	19.05	0.656	16.67	539.217	802.443
		0.812	20.62	0.711	18.05	583.254	867.977
		0.875	22.23	0.766	19.45	627.917	934.443
		0.938	23.83	0.821	20.85	672.495	1000.783
72.00	1828.80	0.500	12.70	0.438	11.11	382.196	586.770
		0.562	14.27	0.492	12.49	429.215	638.743
		0.625	15.88	0.547	13.89	476.909	709.719
		0.688	17.48	0.602	15.29	524.519	780.569
		0.750	19.05	0.656	16.67	571.289	850.172
		0.812	20.62	0.711	18.05	617.977	919.652
		0.875	22.23	0.766	19.45	655.335	990.127
		0.938	23.83	0.821	20.85	712.607	1060.476
76.00	1930.40	0.500	12.70	0.438	11.11	403.577	600.589
		0.562	14.27	0.492	12.49	453.248	674.508
		0.625	15.88	0.547	13.89	503.636	749.493
		0.688	17.48	0.602	15.29	553.940	824.353
		0.750	19.05	0.656	16.67	603.361	897.901
		0.812	20.62	0.711	18.05	625.701	971.326

OUTSIDE DIAMETER		NOMINAL THICKNESS		MINIMUM THICKNESS		WEIGHT	
<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>inch</i>	<i>mm</i>	<i>lb/ft</i>	<i>kg/m</i>
		0.875	22.23	0.766	19.45	702.752	1045.811
		0.938	23.83	0.821	20.85	752.719	1120.169
80.00	2032.00	0.562	14.27	0.492	12.49	477.281	710.273
		0.625	15.88	0.547	13.89	530.363	789.268
		0.688	17.48	0.602	15.29	583.361	868.136
		0.750	19.05	0.656	16.67	635.434	945.630
		0.812	20.62	0.711	18.05	687.425	1023.001
		0.875	22.23	0.766	19.45	740.170	1101.494
		0.938	23.83	0.821	20.85	792.831	1179.862
118.00	3000.00	0.562	14.27	0.492	12.49	477.281	710.273
		0.625	15.88	0.547	13.89	530.363	789.268
		0.688	17.48	0.602	15.29	583.361	868.136
		0.750	19.05	0.656	16.67	635.434	945.630
		0.812	20.62	0.711	18.05	687.425	1023.001
		0.875	22.23	0.766	19.45	740.170	1101.494
		0.938	23.83	0.821	20.85	792.831	1179.862

