

ASTM A53 TYPE E GRADE A and B PIPE



SCOPE

Covers black and hot-dipped galvanized electric resistance welded, Grade A and B. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. SAHATHAI ASTM A53 is UL Listed, sizes 1/2" through 8" nominal. Pipe is suitable for welding, threading, grooving and bending. Pipe is furnished either non-expanded or cold expanded at the option of the manufacturer. Produced to ASTM A53/A53M latest revision.

MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 4" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

HOT-DIP 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

CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S	Co ^A	Ni ^A	Cr ^A	Mo ^A	V ^A
Grade A	0.25 ^B	0.95	0.05	0.045	0.40	0.40	0.40	0.15	0.08
Grade B	0.30 ^C	1.20	0.05	0.045	0.40	0.40	0.40	0.15	0.08

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

B : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.35 %.

C : For each reduction of 0.01 % below the specified carbon maximum, an increase of 0.06 % manganese above the specified maximum will be permitted up to a maximum of 1.65 %.

TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, Psi	48 000	60 000
Yield Strength, min, Psi	30 000	35 000
Elongation in 2"	Refer to A53 Table x 4.1, latest	

BENDING TEST (COLD) FOR NPS 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	12 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

FLATTENING TEST - NPS 2-1/2 and Greater

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsou

Rev.16/05/16

HYDROSTATIC TESTING

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

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Hydrostatic test pressures for plain-end pipe are indicated below

NPS	0.188 in.		SCH 40		SCH 80	
	GR.A	GR.B	GR.A	GR.B	GR.A	GR.B
1/2" through 1	-	-	700	-	850	-
1-1/4"	-	-	1200	-	1800	-
1-1/2"	-	-	1200	-	1800	-
2"	-	-	2300	-	2500	-
2-1/2"	-	-	2500	-	2500	-
3	-	-	2220	-	2500	-
3-1/2"	-	-	2030	-	2800	-
4"	1500	1750	1900	2210	2700	2800
5"	1220	1420	1670	1950	2430	2800
6"	1020	1190	1520	1780	2350	2740
8"	780	920	1340	1570	-	-

DIMENSIONS and WEIGHTS

BLACK PLAIN END							
Nominal Size	OD Inches	Wall 0.188 in.		SCH 40		SCH 80	
		Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.	Wall Inches	Weight Lb./Ft.	
1/2"	.840	-	.109	.85	.147	1.09	
3/4"	1.050	-	.113	1.13	.154	1.48	
1"	1.315	-	.133	1.68	.179	2.17	
1-1/4"	1.660	-	.140	2.27	.191	3.00	
1-1/2"	1.900	-	.145	2.72	.200	3.63	
2"	2.375	-	.154	3.66	.218	5.03	
2-1/2"	2.875	-	.203	5.80	.276	7.67	
3"	3.500	-	.216	7.58	.300	10.26	
3-1/2"	4.000	-	.226	9.12	.318	12.52	
4"	4.500	8.67	.237	10.79	.337	14.98	
5"	5.563	10.80	.237	14.62	.375	20.78	
6"	6.625	12.94	.28	18.97	.432	28.57	
8"	8.625	16.96	.322	28.58	-	-	

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 $\pm .016"$

NPS 2 and over $\pm 1%$

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than $\pm 10%$ from the standard specified.

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: Sch 40 and Sch 80 weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16" \pm 1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

PRODUCT MARKING

Each length of pipe 1/2 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A53), the kind of pipe (E for electric resistance welded, A,B for Grade A,B) the size, and length. Stencil markings indicate UL Listing Approval for sizes 1/2" through 8" nominal, Bar Coding is acceptable as a supplementary identification method.

ASTM A135 GRADE A and B PIPE



SCOPE

Covers two grade of electric resistance welded. steel piping to meet ASTM specifications A135 Grade A and Grade B that is often used in the conveying of gas, vapor, water or other liquids. While the ASTM A135 specification references nominal pipe sizes (NPS), SAHATHAI produces piping sizes up to 8" OD and in wall thicknesses up to 0.148" nominal that meet the requirements called out for in produced to ASTM A135/A135M latest revision.

MANUFACTURE

The weld seam of electric resistance welded pipe in Grade B sizes 3" through 8" nominal, shall be heat treated after welding to a min 1000 °F so that no untempered martensite remains.

CHEMICAL REQUIREMENTS

Composition, max. %

	C	Mn	P	S
Grade A	0.25	0.95	0.035	0.035
Grade B	0.30	1.20	0.035	0.035

TENSILE REQUIREMENTS

	Grade A	Grade B
Tensile Strength, min, MPa	330	415
Yield Strength, min, MPa	205	240
Elongation in 2 in. min, % :		
Wall thickness less than 1/16 in	56t+16.5	148t+14
Tested using a full-size	35	30

FLATTENING TEST

Weld located 0/90 degree from line of direction of force.

Stage-1 : For weld ductility unit 2/3 of outside dia of specimen pipe.

Stage-2 : For ductility of steel unit 1/3 of outside dia of specimen pipe.

Stage-3 : Full flattening for testing of laminated and unsound material.

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

The outside diameter shall not vary more than $\pm 1\%$ from the nominal size specified.

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than $\pm 10\%$ from the standard specified.

DIMENSIONS, WEIGHTS AND TEST PRESSURES

NPS	DN	OD Inches	SCH 10		Test Pressure, psi	
			Wall Inches	Weight Lb./Ft.	Grade A	Grade B
3/4"	20	1.050	.083	.86	2500	-
1"	25	1.315	.109	1.40	2500	-
1-1/4"	32	1.660	.109	1.81	2400	-
1-1/2"	40	1.900	.109	2.09	2100	-
2"	50	2.375	.109	2.64	1700	-
2-1/2"	65	2.875	.120	3.53	1500	-
3"	80	3.500	.120	4.33	1200	1400
3-1/2"	90	4.000	.120	4.97	1000	1200
4"	100	4.500	.120	5.61	900	1100
5"	125	5.563	.134	7.77	850	1000
6"	150	6.625	.134	9.27	750	900
8"	200	8.625	.148	13.41	650	750

END FINISH

Plain End:

Schedule 10: Plain ends pipe for welding beveled to angle of 30°, +5°, -0° with a root face of 1/16" \pm 1/32".

Threaded: To ANSI Standard B 1.20.1

Couplings: To ASTM Standard A865.

PRODUCT MARKING

Each length of pipe 3/8 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe ASTM A135 (Electric Resistance Welded, A,B for Grade A,B) the size, and length. Bar Coding is acceptable as a supplementary identification method.

All information contained herein is accurate as known at the time of publication.

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AS 1074

SCOPE

This Standard specifies the requirements for threaded steel tubes and tubular, and plain-end steel tube suitable for screwing as specified in AS1722.1, and of DN8 to DN150 inclusive (nominal size). Three wall thickness of tube, designated Light, Medium and Heavy

CHEMICAL REQUIREMENTS

Tubes shall be manufactured from steel which shows, not more than 0.045 percent of sulfur and not more than 0.045 percent of phosphorus. Carbon equivalent as calculated from the following equation shall not exceed 0.4

TENSILE REQUIREMENTS

Minimum Yield Strength 195 MPa
 Minimum Tensile Strength 320 MPa
 Minimum Elongation in $5.65\sqrt{S_0}$ 20 %

BENDING TEST (COLD) FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

FLATTENING TEST (COLD) FOR LARGER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

TOLERANCES FOR THICKNESS AND MASS

Thickness

Light welded tubes +unlimited, - 8%
 Medium and heavy welded tubes +unlimited, - 10%

Mass

Standard mass for singer tube +10%, -8%

DIMENSIONS OF STEEL TUBE

LIGHT

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	87.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

SCREW THREADS

The screw thread of all threaded tubes shall comply with AS 1722.1, except as provided below and except that on Light tubes the basic length of useful thread shall be reduce to 80% of the sum of the fitting.

GALVANIZING

Tubes ordered galvanized shall comply with AS1650. Tubes which are to be threaded shall be galvanized before threading.

LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

PRODUCT MARKING

Tube distinguished by color at one end as follows:
 Light tube Brown.
 Medium tube Blue.
 Heavy tube Red.

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AS/NZS 1163

SCOPE

This Standard specifies the requirements for cold-formed, electric resistance-welded, carbon steel hollow sections used for structural purposes. It considers three strength grades, with or without impact properties, that are suitable for welding.

CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	Cr	Mo	Al #1	Ti	Micro alloying elements	CE
C250, C250L0	0.12	0.05	0.50	0.03	0.03	0.15	0.10	0.10	0.04	0.03 #2	0.25
C350, C350L0	0.20	0.45	1.6	0.03	0.03	0.30	0.10	0.10	0.04	0.15 #3	0.43
C450, C450L0	0.20	0.45	1.7	0.03	0.03	0.50	0.35	0.10	0.04	0.15 #3	0.43

#1: Limits specified are for soluble or total aluminium.

#2: Applies to Ni, V only. However, Ni greater than 0.010% is not permitted

#3: Applies to Ni, V and Ti only. However, V greater than 0.10% is not permitted

TENSILE REQUIREMENTS

Grade	Yield strength	Tensile strength	Min. Elongation as a proportion of the Gauge length of $5.65\sqrt{S_0}$, %					
			Circular ; d ₀ /t			Rectangular ; b/t, d/t		
			Min.	Min.	>15≤30	>30	>15≤30	>30
C250, C250L0	250	320	18	20	22	14	16	18
C350, C350L0	350	430	16	18	20	12	14	16
C450, C450L0	450	500	12	14	16	10	12	14

CHARPY V-NOTCH IMPACT REQUIREMENTS

Grade	Test Temp. °C	Min. Absorbed energy ; Joules					
		Size of test piece					
		10 mm x 10 mm		10 mm x 7.5 mm		10 mm x 5 mm	
		Average 3 tests	Individual test	Average 3 tests	Individual test	Average 3 tests	Individual test
C250L0	0	27	20	22	16	18	13
C350L0							
C450L0							

COLD FLATTENING TEST

As a test for quality of the weld, position the weld for OD ≤ 60 mm : 45°, OD > 60 mm : 90° from the direction of force and flatten until the OD is 0.75 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
External dimensions	±1%, with min. of ±0.5 mm.	±1%, with min. of ±0.5 mm.
Thickness	±10%	±10%
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	-
Concavity/convexity	-	Max.0.8% or 0.5 min.
Squareness of sides	-	90°±1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length	0.15% of total length
Mass	Not less than 0.96 times the specified mass on individual length	

EXTERNAL CORNER PROFILE

Perimeter mm.	External corner profile mm.
Equivalent to 50x50 or less	1.5t to 3.0t
Equivalent to greater than 50x50	1.8t to 3.0t

TOLERANCES ON LENGTH

Type of length	Range mm.	Tolerance
Random length	4000 to 6000 with a range of 2000 per order item	10% of section supplied may be below the minimum for the ordered range but not less than 75% of the minimum
Mill (or 'unspecified') length	All	+100 mm. 0
Precision length	< 6000	+5 mm. 0
	≥ 6000 ≤ 10000	+15 mm. 0
	> 10000	+5 mm. +1 mm./m. 0

DIMENSIONS and WEIGHTS

Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size	Wall mm.	Weight Kg/m	Size	Wall mm.	Weight Kg/m
17.2	2.3	0.845	60.3	3.6	5.03	76.1	2.3	4.19
	2.9	1.02		4.5	6.19		3.2	5.75
	2.6	1.20		5.4	7.31		2.6	5.53
21.3	3.2	1.43	76.1	3.6	6.44	88.9	3.2	6.76
	3.6	1.57		4.5	7.95		4.8	9.96
	2.6	1.56		5.9	10.2		5.5	11.3
26.9	3.2	1.87	88.9	4.0	8.38	101.6	2.6	6.35
	4.0	2.26		5.0	10.3		3.2	7.77
	3.2	2.41		5.9	12.1		3.2	8.77
33.7	4.0	2.93	101.6	4.0	9.63	114.3	3.6	9.83
	4.5	3.24		5.0	11.9		4.8	13.0
	3.2	3.09		4.5	12.2		6.0	16.0
42.4	4.0	3.79	114.3	5.4	14.5	139.7	3.0	10.1
	4.9	4.53		5.0	16.6		3.5	11.8
	3.2	3.56		5.4	17.9		3.0	12.0
48.3	4.0	4.37	165.1	5.0	19.7	165.1	3.5	13.9
	5.4	5.71		5.4	21.3		4.8	19.4
							6.4	25.6
						168.3	7.1	28.2
							4.8	25.4
						219.1	6.4	33.6
							8.2	42.6

Square and Rectangular hollow section

Square						Rectangular					
Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	1.6	0.873	65	3.0	5.66	50	1.6	1.63	102	6.0	12.0
	2.0	1.05		4.0	7.23		2.0	1.99		3.5	9.07
	1.6	1.12		5.0	8.75		2.5	2.42		5.0	12.5
25	2.0	1.36	75	6.0	10.1	50	3.0	2.83	125	6.0	14.7
	2.5	1.64		2.5	5.56		1.6	1.75		3.0	8.96
	3.0	1.89		3.0	6.60		2.0	2.15		4.0	11.6
30	1.6	1.38	89	3.5	7.53	50	2.5	2.62	150	5.0	14.2
	2.0	1.68		4.0	8.49		3.0	3.07		2.0	5.57
	2.5	2.05		5.0	10.3		2.0	2.93		2.5	7.53
35	3.0	2.38	100	6.0	12.0	65	2.5	3.60	150	3.0	8.96
	1.6	1.63		3.5	9.06		3.0	4.25		4.0	11.6
	2.0	1.99		5.0	12.5		1.6	2.38		5.0	14.2
40	2.5	2.42	125	6.0	14.6	75	2.0	2.93	150x	4.0	14.8
	3.0	2.83		2.5	7.53		2.5	3.60		5.0	18.2
	1.6	1.88		3.0	8.96		2.0	3.72		6.0	21.4
50	2.0	2.31	150	4.0	11.6	100	2.5	4.58	200x	9.0	30.6
	2.5	2.82		5.0	14.2		3.0	5.42		5.0	16.4
	3.0	3.30		6.0	16.7		4.0	6.92		6.0	19.4
65	4.0	4.09	200	9.0	23.5	150x	5.0	8.35	200x	4.0	17.9
	1.6	2.38		4.0	14.8		6.0	9.67		5.0	22.1
	2.0	2.93		5.0	18.2		2.0	4.50		6.0	26.2
75	2.5	3.6	250	6.0	21.4	100	2.5	5.56	200x	9.0	37.7
	3.0	4.25		9.0	30.6		3.0	6.60			
	4.0	5.35		5.0	22.1		3.5	7.53			
89	5.0	6.39	300	6.0	26.2	150	4.0	8.49			
	2.0	3.88		9.0	37.7		5.0	10.3			
	2.5	4.78									

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

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BS 1387 : 1985

SCOPE

This Standard specifies the requirements for screwed and socketed steel tubes and tubular, and plain-end steel tube suitable for welding or for screwing to BS 21 pipe threads. This standard is applicable to tube of nominal size DN8 to DN150 in three series of thickness, designated Light, Medium and Heavy

MACHANICAL PROPERTIES

The mechanical properties at room temperature

Chemical composition, Max.				Mechanical properties		
C	Mn	P	S	Tensile strength	Yield strength (Min.)	Elongation on gauge length $L_0 = 5.65\sqrt{S_0}$ (Min.),%
%	%	%	%	MPa	MPa	(Min.),%
0.20	1.20	0.045	0.045	320-460	195	20

BENDING TEST FOR DN 50 AND SMALLER:

	Degree of Bend	Diameter of Mandrel
Ungalvanized	180°	6 x outside pipe diameter
Galvanized	90°	8 x outside pipe diameter

FLATTENING TEST FOR GREATER THAN DN 50 :

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 75 % of the original outside diameter. No cracks or breaks in the metal elsewhere than in a weld shall occur unit the direction between the plates is less than 60 % of the original outside diameter of the tube

TOLERANCES FOR THICKNESS AND MASS

Thickness

Light welded tubes	+unlimited, - 8%
Medium and heavy welded tubes	+unlimited, - 10%

Mass

Standard mass for singer tube	+10%, -8%
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DIMENSIONS OF STEEL TUBE

LIGHT

Nominal size	Outside diameter, mm		Thicknes s mm	Mass of black tube,Kg/m	
	Min	Max		Plain ends	Screwed and socketed
DN 8	13.2	13.6	1.8	0.515	0.519
DN 10	16.7	17.1	1.8	0.670	0.676
DN 15	21.0	21.4	2.0	0.947	0.956
DN 20	26.4	26.9	2.3	1.38	1.39
DN 25	33.2	33.8	2.6	1.98	2.00
DN 32	41.9	42.5	2.6	2.54	2.57
DN 40	47.8	48.4	2.9	3.23	3.27
DN 50	59.6	60.2	2.9	4.08	4.15
DN 65	75.2	76.0	3.2	5.71	5.83
DN 80	87.9	88.7	3.2	6.72	6.89
DN 100	113.0	113.9	3.6	9.75	10.0

MEDIUM

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.3	0.641	0.645
DN 10	16.8	17.4	2.3	0.839	0.845
DN 15	21.1	21.7	2.6	1.21	1.22
DN 20	26.6	27.2	2.6	1.56	1.57
DN 25	33.4	34.2	3.2	2.41	2.43
DN 32	42.1	42.9	3.2	3.10	3.13
DN 40	48.0	48.8	3.2	3.57	3.61
DN 50	59.8	60.8	3.6	5.03	5.10
DN 65	75.4	76.6	3.6	6.43	6.55
DN 80	88.1	89.5	4.0	8.37	8.54
DN 100	113.3	114.9	4.5	12.2	12.5
DN 125	138.7	140.6	5.0	16.6	17.1
DN 150	164.1	166.1	5.0	19.7	20.3

HEAVY

Nominal size	Outside diameter,mm		Thickness mm	Mass of black tube,Kg/m	
	Min	Max		Plain or screwed ends	Screwed and socketed
DN 8	13.3	13.9	2.9	0.765	0.769
DN 10	16.8	17.4	2.9	1.02	1.03
DN 15	21.1	21.7	3.2	1.44	1.45
DN 20	26.6	27.2	3.2	1.87	1.88
DN 25	33.4	34.2	4.0	2.94	2.96
DN 32	42.1	42.9	4.0	3.80	3.83
DN 40	48.0	48.8	4.0	4.38	4.42
DN 50	59.8	60.8	4.5	6.19	6.26
DN 65	75.4	76.6	4.5	7.93	8.05
DN 80	88.1	89.5	5.0	10.3	10.5
DN 100	113.3	114.9	5.4	14.5	14.8
DN 125	138.7	140.6	5.4	17.9	18.4
DN 150	164.1	166.1	5.4	21.3	21.9

JOINTS

All screwed tubes and sockets shall be threaded in accordance with BS 21 except as provided below and except that on Light tubes the length of useful thread shall be reduce to 80% of that shown in column 12 of table2 of BS 21:1985.

HOT-DIP ZINC COATING

Where tubes are supplied hot-dip zinc coated, they shell first be thoroughly descaled, washed as necessary and then dipped in a bath of molten zinc, containing not less than 98.5% by mass of zinc.

LEAK TIGHTNESS TEST

Every tube shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

PRODUCT MARKING

Tubes and tubular shall be marked with the appropriate color as follows:

Light tube	Brown.
Medium tube	Blue.
Heavy tube	Red.

All information contained herein is accurate as known at the time of publication.

STS reserves the right to change product specifications without notice and without incurring obligations.

SAHATHAI STEEL PIPE CO.,LTD – 78 MOO 3 POOCHAO ROAD, BANGYAPRAEK, PHRAPRADAENG, SAMUTHPRAKARN 10130 THAILAND

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EN 10219 : 2006



SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment

CHEMICAL REQUIREMENTS

Composition, max. %

Grade	C	Si	Mn	P	S	N ^a
S235JRH	.17	-	1.40	.040	.040	.009
S275J0H	.20	-	1.50	.035	.035	.009
S275J2H	.20	-	1.50	.030	.030	-

a: The max. value for N does not apply if the chemical composition shows a min. total Al content of 0.020% with a min. Al/N ratio of 2:1, or if sufficient other N-binding elements are present. The N-binding elements shall be recorded in Inspection Document.

TENSILE AND IMPACT REQUIREMENTS

Grade	Min. yield strength MPa	Tensile strength MPa	Min. elongation A ^d %	Min. Impact Energy KV ^e J			
				At test temperature			
Specified thickness mm.				At test temperature			
				-20°C	0°C	20°C	
S235JRH ^a	235	360-510	360-510	24 ^b	-	-	27
					-	27	-
S275J0H ^a	275	430-580	410-560	20 ^c	-	-	-
					27	-	-
S275J2H							

a : The impact properties are verified only when Option 1.3 is specified.

b : For thicknesses >3 mm and section size D/T <15 (round) and (B+T)/2T <12.5 (square and rectangular) the min. elongation is reduced by 2. For thicknesses ≤ 3mm. the min. value for elongation is 17%

c : For section sizes D/T <15 (circular) and (B/T)/2T < 12.5 (square and rectangular) the min. elongation is reduced by 2.

d : For thickness <3mm. see 9.2.2

e : For impact properties for reduced section test pieces see 6.7.2

TOLERANCES FOR SHAPE AND MASS

Characteristic	Circular	Square and Rectangular
Outside dimensions	±1%, with min. of ±0.5 mm. And a max. of ± 10 mm.	H,B<100 = ±1%, with min. of ±0.5 mm. 100≤H,B≤200 = ±0.8%
Thickness	T ≤ 5mm = ± 10% T > 5 mm. = ± 0.5 mm.	
Out-of-roundness	2% for hollow sections having a diameter to thickness ratio not exceeding 100	
Concavity/conve xity	-	Max.0.8% with a min. of 0.5 mm.
External corner	-	T ≤ 6mm. = 1.6t to 2.4t 6 < T ≤ 10 mm. = 2.0t to 3.0t T > 10 mm. = 2.4t to 3.6t
Squareness of side	-	90° ± 1°
Twist	-	2+0.5 mm/m length
Straightness	0.20% of total length and 3 mm. over any 1m. length	0.15% of total length and 3 mm. over any 1m. length
Mass	± 6 % on individual delivered lengths	

DIMENSIONS and WEIGHTS

Circular hollow section

Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
21.3	2.0	0.95	76.1	2.0	3.65	114.3	4.0	10.90
	2.5	1.16		2.5	4.54		5.0	13.50
	3.0	1.35		3.0	5.41		6.0	16.00
26.9	2.0	1.23	76.1	4.0	7.11	114.3	6.3	16.80
	2.5	1.50		5.0	8.77		8.0	21.00
	3.0	1.77		6.0	10.40		3.0	10.10
33.7	2.0	1.56	76.1	6.3	10.80	139.7	4.0	13.40
	2.5	1.92		2.0	4.29		5.0	16.60
	3.0	2.27		2.5	5.33		6.0	19.80
42.4	2.0	1.99	88.9	3.0	6.36	139.7	6.3	20.70
	2.5	2.46		4.0	8.38		8.0	26.00
	3.0	2.91		5.0	10.3		3.0	12.20
48.3	4.0	3.79	88.9	6.0	12.3	168.3	4.0	16.20
	2.0	2.28		6.3	12.8		5.0	20.10
	2.5	2.82		2.0	4.91		6.0	24.00
60.3	3.0	3.35	101.6	2.5	6.11	219.1	6.3	25.20
	4.0	4.37		3.0	7.29		8.0	31.60
	5.0	5.34		4.0	9.63		4.0	21.20
60.3	2.0	2.88	114.3	5.0	11.90	219.1	5.0	26.40
	2.5	3.56		6.0	14.10		6.0	31.50
	3.0	4.24		6.3	14.80		6.3	33.10
	4.0	5.55		2.5	6.89		8.0	41.60
	5.0	6.82		3.0	8.23			

Square and Rectangular hollow section

Square						Rectangular					
Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m	Size mm.	Wall mm.	Weight Kg/m
20	2.0	1.05	80	3.0	7.07	40x20	2.0	1.68	200x100	6.3	27.40
	2.0	1.36		4.0	9.22		2.5	2.03		8.0	33.90
	2.5	1.64		5.0	11.30		3.0	2.36		10.0	41.30
25	3.0	1.89	90	3.0	8.01	50x30	2.0	2.31	200x100	12.0	47.10
	2.0	1.69		4.0	10.50		2.5	2.82		12.5	48.70
	2.5	2.03		5.0	12.80		3.0	3.30			
30	3.0	2.36	100	3.0	8.96	60x40	2.0	2.93	200x100		
	2.0	2.31		4.0	11.70		2.5	3.60			
	2.5	2.82		5.0	14.40		3.0	4.25			
40	3.0	3.30	150	4.0	18.00	100x50	2.5	5.56	200x100		
	2.0	2.93		5.0	22.30		3.0	6.60			
	2.5	3.60		6.0	26.40		4.0	8.59			
50	3.0	4.25	150	6.3	27.40	120x80	5.0	10.50	200x100		
	4.0	5.45		8.0	33.90		4.0	11.70			
	2.0	3.56		10.0	41.30		5.0	14.90			
60	3.0	5.19	150	12.0	47.10	150x100	4.0	18.00	200x100		
	4.0	6.71		12.5	48.70		5.0	22.30			
	5.0	8.13					6.0	26.40			

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SAHATHAI STANDARD MAKE TO ORDER ; MTO

SCOPE

This Standard specifies the technical delivery conditions for cold formed welded structural hollow section of circular, square or rectangular forms and applies to structural hollow section formed cold without subsequent heat treatment. Produced to SAHATHAI

MANUFACTURE

The weld seam of electric resistance welded pipe in Circular Hollow sections sizes 1/2" to 2-1/2", square hollow sections size 1"x1" to 4"x4" and rectangular hollow sections size 2"x1" to 6"x2".

HOT-DIP GALVANIZED

The average weight of zinc coating shall be not less than 300 g/m² 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

CHEMICAL REQUIREMENTS

Composition, max. %

C	Mn	P	S
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

TENSILE REQUIREMENTS

Tensile Strength, min, MPa	330
Yield Strength, min, MPa	N/A
Elongation in 2" min, %	15

BENDING TEST FOR CHS SIZE 2 and UNDER:

	Degree of Bend	Diameter of Mandrel
Standard	90°	6 x outside pipe diameter
Close Coiling	180°	8 x outside pipe diameter

FLATTENING TEST FOR CHS SIZE 2-1/2:

As a test for quality of the weld, position the weld at 90° from the direction between the plates is less than 2/3 D of the original outside diameter. No cracks or breaks

DIMENSIONS and WALL THICKNESS

CHS		SHS		RHS	
SIZE	Thickness (mm.)	SIZE	Thickness (mm.)	SIZE	Thickness (mm.)
1/2"	1.4 - 2.0	1"	1.2 - 2.0	2" x 1"	1.2 - 2.0
3/4"		1-1/4"		3" x 1-1/2"	
1-1/4"		1-1/2"		4" x 2"	
1-1/2"		2"		5" x 3"	2.0 - 3.0
2"		3"		6" x 2"	
2-1/2"	2.0 - 2.6	4"	2.0 - 3.0		

PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 0.1 mm. under nominal wall thickness specified.

PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

CHS +3 mm., -2 mm.
SHS, RHS ± 3 mm.

PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

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

HYDROSTATIC TESTING

Every tube galvanized threaded and threading; GTT shall be tested at the manufacturer work by a hydrostatic test at a pressure of 5 MPa maintained for at least 5 s. The tube shall not leak during the test.

Threaded: To ANSI Standard B 1.20.1

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