PT. GUNUNG RAJA PAKSI

steel is our business

Product Catalogue

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Introduction

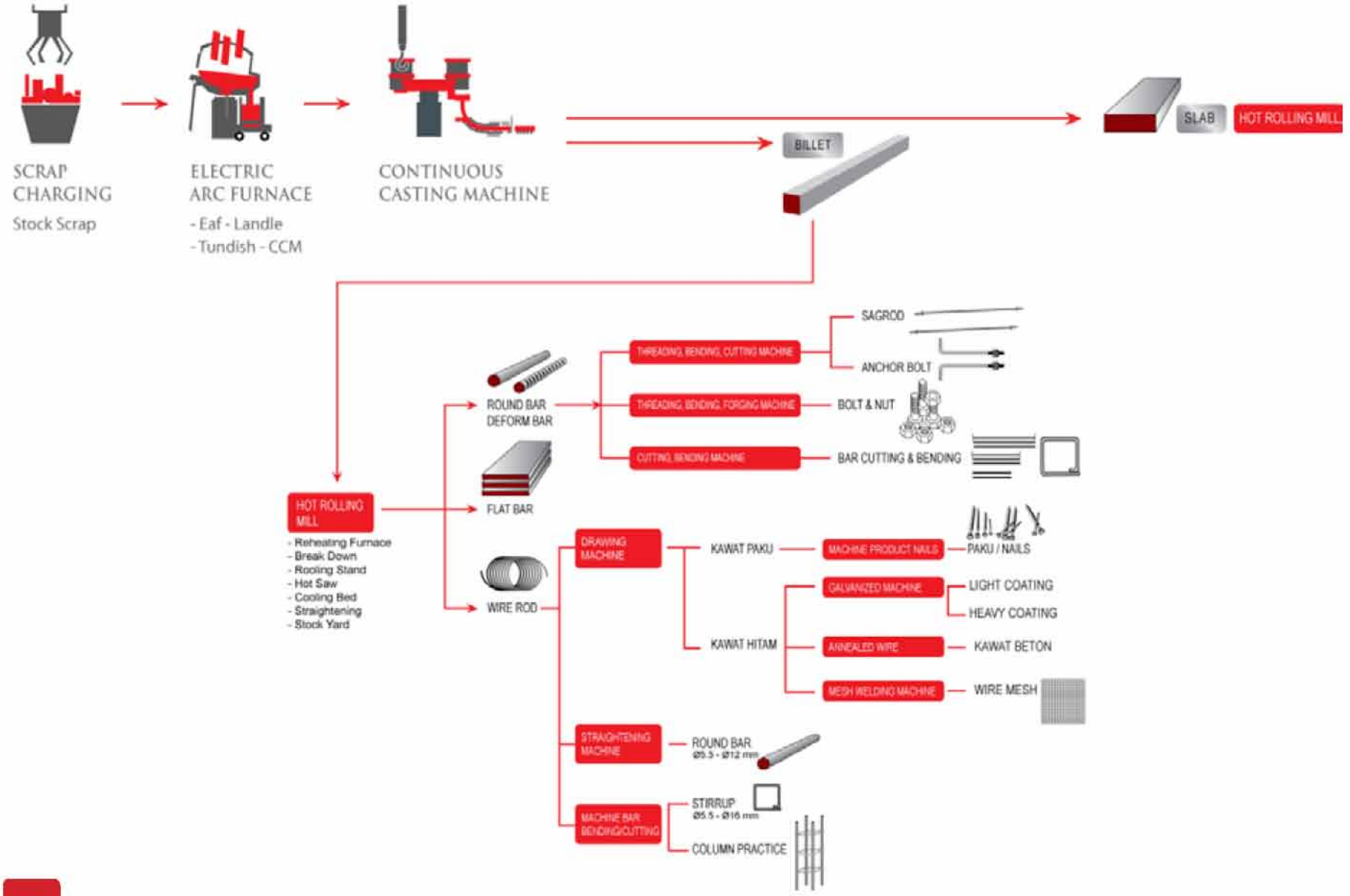
Embracing the motto "One Stop Steel Shop", our company was formed in 2000 under the name PT. Gunung Raja Paksi (GRP). With the establishment of our company, we at PT. Gunung Raja Paksi are able to expand into a wider range of steel products and this has put our group, Gunung Steel Group, as a leading steel producer in Indonesia.

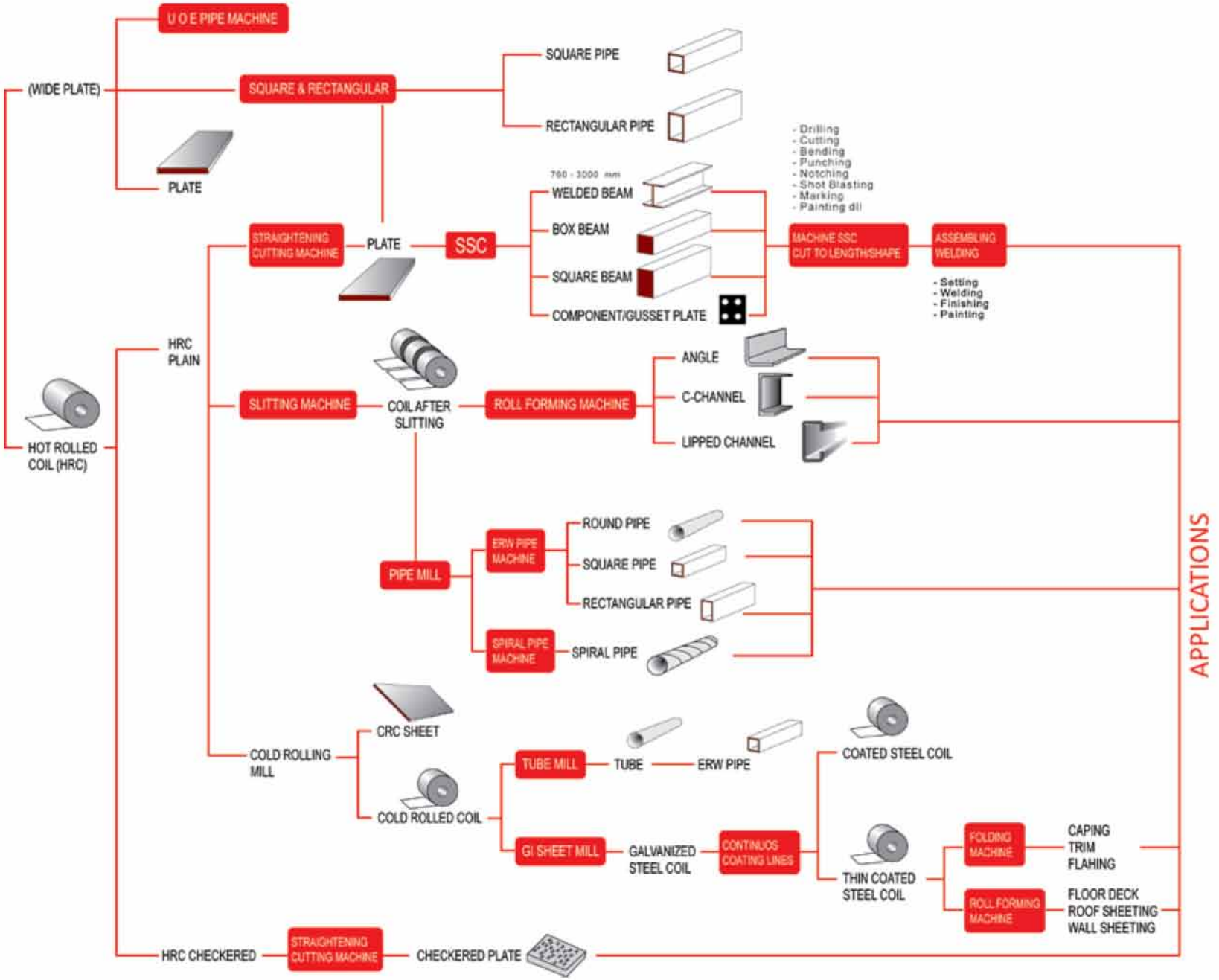
We commissioned our first hot rolled steel machine in the last quarter of the year 2000. By the late of 2001, our mill has reached an operating level of 82% of the capacity, due to the popular demand of our product. Our success in the industry has been made with the advanced technology equipped throughout our plants. This ensures that we are able to meet the needs of our customer no matter how complicate it may be. Among the products we currently produces are the flat, coils, welded pipe, decking, and wire steel products.

To better serve the needs of our customers, we at GRP have support centre division to provide services for further customization of our products to suit specific requirements. The services we provides are:

- Engineering Fabrication Construction (EFC) - covers structural engineering consultation, drawing, drafting, and components/parts fabrication.
- Coil Service Center (CSC) covers fabrication for Hot Rolled Coil with wide range of customization including Cut to length, Leveling, Skin Pass and Slitting.
- Plate Service Center (PSC) covers fabrication for Hot Rolled Steel Plate with its state of the art machinary including Cut to shape, Bending, Drilling, Punching, Shearing, Stamping.
- Forming Service Center (FSC) covers fabrication for Cold Formed Products such as C-Channel, Electric Pole, Equal Angle, Floor Deck, Guard Rail, Lipped Channel, Hollow Section, etc.
- Bar Service Center (BSC) covers fabrication for Round Steel Bar and Rod Bracing service provided includes Bending, Cut to Length, Threading, Welding.

Production WorkFlow Gunung Raja Paksi

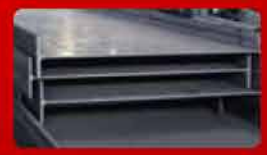



U O E PIPE MACHINE
(WIDE PLATE)
SQUARE & RECTANGULAR
SQUARE PIPE
RECTANGULAR PIPE
PLATE
- Drilling
- Cutting
- Bending
- Punching
- Notching
- Shot Blasting
- Marking
- Painting dll
700 - 3000 mm
WELDED BEAM
BOX BEAM
SQUARE BEAM
COMPONENT/GUSSET PLATE
STRAIGHTENING CUTTING MACHINE
PLATE
SSC
MACHINE SSC CUT TO LENGTH/SHAPE
ASSEMBLING WELDING
- Setting
- Welding
- Finishing
- Painting
HRC PLAIN
HOT ROLLED COIL (HRC)
SLITTING MACHINE
COIL AFTER SLITTING
ROLL FORMING MACHINE
ANGLE
C-CHANNEL
LIPPED CHANNEL
PIPE MILL
ERW PIPE MACHINE
ROUND PIPE
SQUARE PIPE
RECTANGULAR PIPE
SPIRAL PIPE MACHINE
SPIRAL PIPE
CRC SHEET
COLD ROLLING MILL
COLD ROLLED COIL
TUBE MILL
TUBE
ERW PIPE
GI SHEET MILL
GALVANIZED STEEL COIL
CONTINUOS COATING LINES
COATED STEEL COIL
THIN COATED STEEL COIL
FOLDING MACHINE
CAPING
TRIM
FLAHING
ROLL FORMING MACHINE
FLOOR DECK
ROOF SHEETING
WALL SHEETING
HRC CHECKERED
STRAIGHTENING CUTTING MACHINE
CHECKERED PLATE
APPLICATIONS

Flat Products







Steel Plate

At PT. Gunung Raja Paksi we understand the diverse demand for this form of flat steel as we produce steel plates from Mild Steel, High-Strength Low Alloy, Pressure Vessel, Ship Building Plates, and for general purpose uses.

We also understand the various uses and applications of steel plates, and as one of the leading steel mill, we can produce the majority of plate grades and standard as issued by the world's major third party certification entities such as BV, ABS, BKI, DNV, LR, GL, TUV, NK & CE Marked, and each with their different sub-grades.

To further enhance the performance of our steel product, we have recently added a normalizing facility. This process is to accomodate with a minimum thickness of 8mm and maximum 80mm steel plate and will provide the additional performance enhancement to our high tensile plate range.

With the combination of experience we have accumulate through the years in the industry and the different type of cutting machine we have at our disposal, we are also able to fulfill the majority of sizes and dimensions required by our customers.

Standard & Specification	: ASTM, JIS, EN 10025, AS 3678, DIN 17100, EN 10225, API 5L, API 2H, BS 4360, EN 10028, ASME, and Ship Building such: ABS, DNV, LR, BKI, GL, BV, NK.
Standard Size	: Min. width 1200mm, max. width 3050mm, Length: as per request (15 meter)
Annual Capacity	: 1.200.000 MT/Year

CALCULATED PLATE WEIGHT (FROM THICKNESS & SIZE)

Width x Length (in mm)	1219 x 2438	1219 x 6096	1524 x 3048	1524 x 6096	1524 x 9144	1524 x 12192	1829 x 6096	1829 x 12192	2133 x 6096	2133 x 12192	2438 x 6096	2438 x 12192	2743 x 6096	2743 x 12192	3048 x 6096	3048 x 12192	3353 x 6096	3353 x 12192
Width x Length (in ft)	4' x 8'	4' x 20'	5' x 10'	5' x 20'	5' x 30'	5' x 40'	6' x 20'	6' x 40'	7' x 20'	7' x 40'	8' x 20'	8' x 40'	9' x 20'	9' x 40'	10' x 20'	10' x 40'	11' x 20'	11' x 40'
Width x Length (in inch)	48 x 96	48 x 240	60 x 120	60 x 240	60 x 360	60 x 480	72 x 240	72 x 480	84 x 240	84 x 480	96 x 240	96 x 480	108 x 240	108 x 480	120 x 240	120 x 480	132 x 240	132 x 480
Thickness (mm)																		
8	187	467	292	583	875	1.167	700	1.400	817	1.633	933	1.867	1.050	2.100	1.167	2.334	1.284	2.567
9	210	525	328	656	985	1.313	788	1.575	919	1.837	1.050	2.100	1.181	2.363	1.313	2.625	1.444	2.888
10	233	583	365	729	1.094	1.459	875	1.750	1.021	2.041	1.167	2.333	1.313	2.625	1.459	2.917	1.605	3.209
12	280	700	438	875	1.313	1.750	1.050	2.101	1.225	2.450	1.400	2.800	1.575	3.150	1.750	3.501	1.925	3.851
12.7	296	741	463	926	1.389	1.852	1.112	2.223	1.296	2.593	1.482	2.963	1.667	3.334	1.852	3.705	2.038	4.076
14	327	817	511	1.021	1.532	2.042	1.225	2.451	1.429	2.858	1.633	3.267	1.838	3.675	2.042	4.084	2.246	4.493
15	350	875	547	1.094	1.641	2.188	1.313	2.626	1.531	3.062	1.750	3.500	1.969	3.938	2.188	4.376	2.407	4.814
16	373	933	583	1.167	1.750	2.334	1.400	2.801	1.633	3.266	1.867	3.733	2.100	4.200	2.334	4.667	2.567	5.134
18	420	1.050	656	1.313	1.969	2.625	1.575	3.151	1.837	3.675	2.100	4.200	2.363	4.725	2.625	5.251	2.888	5.776
19	443	1.108	693	1.386	2.078	2.771	1.663	3.326	1.939	3.879	2.217	4.433	2.494	4.988	2.771	5.543	3.049	6.097
20	467	1.167	729	1.459	2.188	2.917	1.750	3.501	2.041	4.083	2.333	4.667	2.625	5.250	2.917	5.834	3.209	6.418
22	513	1.283	802	1.604	2.407	3.209	1.926	3.851	2.246	4.491	2.567	5.133	2.888	5.776	3.209	6.418	3.530	7.060
24	560	1.400	875	1.750	2.625	3.501	2.101	4.201	2.450	4.899	2.800	5.600	3.150	6.301	3.501	7.001	3.851	7.702
25	583	1.458	912	1.823	2.735	3.646	2.188	4.376	2.552	5.104	2.917	5.833	3.282	6.563	3.646	7.293	4.011	8.023
25.4	593	1.482	926	1.852	2.779	3.705	2.223	4.446	2.593	5.185	2.963	5.927	3.334	6.668	3.705	7.410	4.076	8.151
26	607	1.517	948	1.896	2.844	3.792	2.276	4.551	2.654	5.308	3.033	6.067	3.413	6.826	3.792	7.585	4.172	8.344
28	653	1.633	1.021	2.042	3.063	4.084	2.451	4.901	2.858	5.716	3.267	6.533	3.675	7.351	4.084	8.168	4.493	8.985
30	700	1.750	1.094	2.188	3.282	4.376	2.626	4.251	3.062	6.124	3.500	7.000	3.938	7.876	4.376	8.751	4.814	9.627
32	747	1.867	1.167	2.334	3.501	4.667	2.801	5.602	3.266	6.533	3.733	7.467	4.200	8.401	4.667	9.335	5.134	10.269
36	840	2.100	1.313	2.625	3.938	5.251	3.151	6.302	3.675	7.349	4.200	8.400	4.725	9.451	5.251	10.502	5.776	11.553
38	887	2.217	1.386	2.771	4.157	5.543	3.326	6.652	3.879	7.757	4.433	8.867	4.988	4.976	5.543	11.085	6.097	12.194
40	933	2.333	1.459	2.917	4.376	5.834	3.501	7.002	4.083	8.166	4.667	9.333	5.250	10.501	5.834	11.669	6.418	12.836
45	1.050	2.625	1.641	3.282	4.923	6.564	3.939	7.877	4.593	9.186	5.250	10.500	5.907	11.814	6.564	13.127	7.220	14.441
50	1.166	2.917	1.823	3.646	5.470	7.293	4.376	8.752	5.104	10.207	5.833	11.667	6.563	13.126	7.293	14.586	8.023	16.045
55	1.283	3.208	2.006	4.011	6.017	8.022	4.814	9.628	5.614	11.228	6.417	12.833	7.219	14.439	8.022	16.044	8.825	17.650
60	1.400	3.500	2.188	4.376	6.564	8.751	5.251	10.503	6.124	12.249	7.000	14.000	7.876	15.751	8.751	17.503	9.627	19.254
65	1.516	3.792	2.370	4.740	7.111	9.481	5.689	11.378	6.635	13.269	7.583	15.167	8.532	17.064	9.481	18.962	10.429	20.859
70	1.633	4.083	2.553	5.105	7.658	10.210	6.127	12.253	7.145	14.290	8.167	16.333	9.188	18.377	10.210	20.420	11.232	22.463
75	1.750	4.375	2.735	5.470	8.204	10.939	6.564	13.129	7.655	15.311	8.750	17.500	9.845	19.689	10.939	21.879	12.034	24.068
80	1.866	4.667	2.917	5.834	8.751	11.669	7.002	14.004	8.166	16.331	9.333	18.667	10.501	21.002	11.669	23.337	12.836	25.672
85	1.983	4.958	3.099	6.199	9.298	12.398	7.440	14.879	8.676	17.352	9.917	19.833	11.157	22.315	12.398	24.796	13.639	27.277
90	2.100	5.250	3.282	6.564	9.845	13.127	7.877	15.754	9.186	18.373	10.500	21.500	11.814	23.627	13.127	26.254	14.441	28.882
95	2.216	5.542	3.464	6.928	10.392	13.856	8.315	16.630	9.697	19.394	11.083	22.167	12.470	24.940	13.856	27.713	15.243	30.486
100	2.333	5.833	3.646	7.293	10.939	14.586	8.752	17.505	10.207	20.414	11.667	23.333	13.126	26.252	14.586	29.172	16.045	32.091

Conculated considering specific gravity of steel as 7.85 Kg/mm2, and dimension in mm.

Not Available Sizes

MILD STEEL

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm^2)	UTS (N/mm^2)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
EN 10025-2 TH 2004	S 235 JR+AR	5 - 150	<3	235	360 - 510	19 (80mm)	-	-	-	FOR NON-ALLOY STRUCTURAL STEELS	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. EN 10025-3 (TH 2004) (S 275 NL) 2. S235 & S275 JR, Impact test are verified only when specified at the time of the enquiry and order.
			≥ 3 ≤ 16	235	360 - 510	24 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	225	360 - 510	24 (5.65VSo)	-	20 °C [27]	-		
			> 40 ≤ 63	215	360 - 510	23 (5.65VSo)	-	20 °C [27]	-		
			> 63 ≤ 80	215	360 - 510	22 (5.65VSo)	-	20 °C [27]	-		
			> 80 ≤ 100	215	360 - 510	22 (5.65VSo)	-	20 °C [27]	-		
			> 100 ≤ 150	195	350 - 500	22 (5.65VSo)	-	20 °C [27]	-		
EN 10025-2 TH 2004	S 235 JO + AR	5 - 150	<3	235	360 -510	19 (80mm)	-	-	-		
			≥ 3 ≤ 16	235	360 -510	24 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	225	360 -510	24 (5.65VSo)	-	0 °C [27]	-		
			> 40 ≤ 63	215	360 -510	23 (5.65VSo)	-	0 °C [27]	-		
			> 63 ≤ 80	215	360 -510	22 (5.65VSo)	-	0 °C [27]	-		
			> 80 ≤ 100	215	360 -510	22 (5.65VSo)	-	0 °C [27]	-		
			> 100 ≤ 150	195	350 - 500	22 (5.65VSo)	-	0 °C [27]	-		
	S 235 J2+N	6 - 150	<3	235	360 -510	19 (80mm)	-	-	-		
			≥ 3 ≤ 16	235	360 -510	24 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	225	360 -510	24 (5.65VSo)	-	-20 °C [27]	-		
			> 40 ≤ 63	215	360 -510	23 (5.65VSo)	-	-20 °C [27]	-		
			> 63 ≤ 80	215	360 -510	22 (5.65VSo)	-	-20 °C [27]	-		
			> 80 ≤ 100	215	360 -510	22 (5.65VSo)	-	-20 °C [27]	-		
			> 100 ≤ 150	195	350 - 500	22 (5.65VSo)	-	-20 °C [27]	-		
	S 275 JR+AR	5 - 150	<3	275	430 - 580	17 (80mm)	-	-	-		
			≥ 3 ≤ 16	275	410 - 560	21 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	265	410 - 560	21 (5.65VSo)	-	20 °C [27]	-		
			> 40 ≤ 63	255	410 - 560	20 (5.65VSo)	-	20 °C [27]	-		
			> 63 ≤ 80	245	410 - 560	19 (5.65VSo)	-	20 °C [27]	-		
			> 80 ≤ 100	235	410 - 560	19 (5.65VSo)	-	20 °C [27]	-		
			> 100 ≤ 150	225	410 - 560	19 (5.65VSo)	-	20 °C [27]	-		
	S 275 JO + AR	5 - 150	<3	275	430 - 580	17 (80mm)	-	-	-		
			≥ 3 ≤ 16	275	410 - 560	21 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	265	410 - 560	21 (5.65VSo)	-	0 °C [27]	-		
			> 40 ≤ 63	255	410 - 560	20 (5.65VSo)	-	0 °C [27]	-		
			> 63 ≤ 80	245	410 - 560	19 (5.65VSo)	-	0 °C [27]	-		
			> 80 ≤ 100	235	410 - 560	19 (5.65VSo)	-	0 °C [27]	-		
			> 100 ≤ 150	225	400 - 540	19 (5.65VSo)	-	0 °C [27]	-		
EN 10025-2 TH 2004	S 275 J2+N	5 - 150	<3	275	430 - 580	17 (80mm)	-	-	-		
			≥ 3 ≤ 16	275	410 - 560	21 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	265	410 - 560	21 (5.65VSo)	-	-20 °C [27]	-		
			> 40 ≤ 63	255	410 - 560	20 (5.65VSo)	-	-20 °C [27]	-		
			> 63 ≤ 80	245	410 - 560	19 (5.65VSo)	-	-20 °C [27]	-		
			> 80 ≤ 100	235	410 - 560	19 (5.65VSo)	-	-20 °C [27]	-		
			> 100 ≤ 150	225	400 - 540	19 (5.65VSo)	-	-20 °C [27]	-		
EN 10025-3 TH 2004	S 275 NL	8 - 80	≤ 16	275	370 - 510	24 (5.65VSo)	-	20°C [63], 0°C [55]	-	FOR GENERAL STRUCTURE PURPOSE	
			> 16 ≤ 40	265	370 - 510	24 (5.65VSo)	-	-10°C [51], -20°C [47]	-		
			> 40 ≤ 63	255	370 - 510	24 (5.65VSo)	-	-30°C [40], -40°C [31],	-		
			> 63 ≤ 80	245	370 - 510	23 (5.65VSo)	-	-50°C [27]	-		
ASTM A 283 (2011) ASME SA 283 (2010, 2011a Addenda)	A	5 - 50	≤ 40	165	310 - 415	27 (200mm)	-	-	-	FOR LOW AND INTERMEDIATE TENSILE STRENGTH CARBON STEEL PLATES	
			> 40	165	310 - 415	30 (50mm)	-	-	-		
	B	5 - 50	≤ 40	185	345 - 450	25 (200mm)	-	-	-		
			> 40	185	345 - 450	28 (50mm)	-	-	-		
	C	5 - 50	≤ 40	205	380 - 515	22 (200mm)	-	-	-		
			> 40	205	380 - 515	25 (50mm)	-	-	-		
	D	5 - 50	≤ 40	230	415 - 550	20 (200mm)	-	-	-		
			> 40	230	415 - 550	23 (50mm)	-	-	-		

MILD STEEL

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
AS 3678	250	5 - 150	≤ 8	280	410 min	22 (5.65VSo)	-	-	-	STRUCTURAL STEEL HOT ROLLED PLATES, FLOORPLATES AND SLABS	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10').
			> 8 ≤ 12	260	410 min	22 (5.65VSo)	-	-	-		
			> 12 ≤ 20	250	410 min	22 (5.65VSo)	-	-	-		
			> 20 ≤ 32	250	410 min	22 (5.65VSo)	-	-	-		
			> 32 ≤ 50	250	410 min	22 (5.65VSo)	-	-	-		
			> 50 ≤ 80	240	410 min	22 (5.65VSo)	-	-	-		
			> 80 ≤ 150	230	410 min	22 (5.65VSo)	-	-	-		
	300	5 - 150	≤ 8	320	430 min	21 (5.65VSo)	-	-	-		- For thickness more than 80mm can be supplied without mill certificate.
			> 8 ≤ 12	310	430 min	21 (5.65VSo)	-	-	-		
			> 12 ≤ 20	300	430 min	21 (5.65VSo)	-	-	-		
			> 20 ≤ 32	280	430 min	21 (5.65VSo)	-	-	-		
			> 32 ≤ 50	280	430 min	21 (5.65VSo)	-	-	-		
			> 50 ≤ 80	270	430 min	21 (5.65VSo)	-	-	-		
			> 80 ≤ 150	260	430 min	21 (5.65VSo)	-	-	-		
ASTM A 36 (2011) ASME SA 36 (2010, 2011a addenda)	-	2 - 150	≤ 20	250	400 - 550	20 (200mm)	-	-	-	FOR CARBON STRUCTURAL STEEL	- Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill.
			> 20 ≤ 40	250	400 - 550		-	-	-		
			> 40 ≤ 65	250	400 - 550	23 (50mm)	-	-	-		
			> 65 ≤ 100	250	400 - 550		-	-	-		
			> 100	250	400 - 550		-	-	-		
ASTM A 131 (2011)	A	5 - 80	≤ 25	235	400 - 520	21 (200mm)	-	-	-	FOR STRUCTURAL STEEL FOR SHIPS	- Shotblasting and primer shop are available, with max. width 3,048mm (10').
			> 25 ≤ 35	235	400 - 520		-	-	-		
			> 35 ≤ 50	235	400 - 520		-	-	-		
			> 50 ≤ 70	235	400 - 520	24 (50mm)	-	20 °C [34]	20 °C [24]		
			> 70 ≤ 100	235	400 - 520		-	20 °C [41]	20 °C [27]		
	B	5 - 80	≤ 25	235	400 - 520	21 (200mm)	-	-	-		
			> 25 ≤ 35	235	400 - 520		-	0 °C [27]	0 °C [20]		
			> 35 ≤ 50	235	400 - 520		-	0 °C [27]	0 °C [20]		
			> 50 ≤ 70	235	400 - 520	24 (50mm)	-	0 °C [34]	0 °C [24]		
			> 70 ≤ 100	235	400 - 520		-	0 °C [41]	0 °C [27]		
	D	5 - 80	≤ 25	235	400 - 520	21 (200mm)	-	-20 °C [27]	-20 °C [20]		
			> 25 ≤ 35	235	400 - 520		-	-20 °C [27]	-20 °C [20]		
			> 35 ≤ 50	235	400 - 520		-	-20 °C [27]	-20 °C [20]		
			> 50 ≤ 70	235	400 - 520	24 (50mm)	-	-20 °C [34]	-20 °C [24]		
			> 70 ≤ 100	235	400 - 520		-	-20 °C [41]	-20 °C [27]		
	E	8 - 80	≤ 25	235	400 - 520	21 (200mm)	-	-40 °C [27]	-40 °C [20]		
			> 25 ≤ 35	235	400 - 520		-	-40 °C [27]	-40 °C [20]		
			> 35 ≤ 50	235	400 - 520		-	-40 °C [27]	-40 °C [20]		
			> 50 ≤ 70	235	400 - 520	24 (50mm)	-	-40 °C [34]	-40 °C [24]		
			> 70 ≤ 100	235	400 - 520		-	-40 °C [41]	-40 °C [27]		
ASTM 830 TO SAE (2011)	1010	≤ 80	-	-	-	-	-	-	-	FOR PLATES, CARBON STEEL, STRUCTURAL QUALITY.	
	1006	≤ 80	-	-	-	-	-	-	-		
	1008	≤ 80	-	-	-	-	-	-	-		
	1015	≤ 80	-	-	-	-	-	-	-		
	1020	≤ 80	-	-	-	-	-	-	-		
JIS G 3101 (2011)	SS 400	2 - 150	≤ 5	245	400 - 510	21 (50mm)	Bending 180° 1.5 x t	-	-	FOR GENERAL STRUCTURE	
			> 5 ≤ 16	245	400 - 510	17 (200mm)		-	-		
			>16 ≤ 40	235	400 - 510	21 (200mm)		-	-		
			>40 ≤ 100	215	400 - 510	23 (50mm)		-	-		
			> 100	205	400 - 510	23 (50mm)		-	-		
API 5L PSL 1 Welded Pipe	B	8 - 25	≤ 25	245 min	415 min	-	-	-	-	-	
API 5L PSL 2 Welded Pipe	BM	8 - 30	≤ 25	245 - 450	415 - 760	-	-	-	0 °C [27]	-	

MILD STEEL

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm^2)	UTS (N/mm^2)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
JIS G 3106 (2011)	SM 400 A	5 - 150	≤ 5	245	400 - 510	23 (50mm)	-	-	-	FOR WELDED STRUCTURE	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10').
			> 5 ≤ 16	245	400 - 510	18 (200mm)	-	-	-		
			> 16 ≤ 40	235	400 - 510	22 (200mm)	-	-	-		- For thickness more than 80mm can be supplied without mill certificate.
			> 40 ≤ 75	215	400 - 510	24 (50mm)	-	-	-		
			> 75 ≤ 100	215	400 - 510	24 (50mm)	-	-	-		- Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill.
			> 100 ≤ 160	205	400 - 510	24 (50mm)	-	-	-		
	SM 400 B	5 - 150	≤ 5	245	400 - 510	23 (50mm)	-	-	-		- Shotblasting and primer shop are available, with max. width 3,048mm (10').
			> 5 ≤ 16	245	400 - 510	18 (200mm)	-	0 °C [27]	-		
			> 16 ≤ 40	235	400 - 510	22 (200mm)	-	0 °C [27]	-		- Product below with NORMALIZED: 1. DIN 17100 (1966) *Grade : ST 37.2 Prod. Thick.: 6 - 80 Thick. Range : >25 *Grade : ST 42.2 Prod. Thick.: 6 - 80 Thick. Range : >25
			> 40 ≤ 75	215	400 - 510	24 (50mm)	-	0 °C [27]	-		
			> 75 ≤ 100	215	400 - 510	24 (50mm)	-	0 °C [27]	-		
			> 100 ≤ 160	205	400 - 510	24 (50mm)	-	0 °C [27]	-		
	SM 400 C	5 - 150	≤ 5	245	400 - 510	23 (50mm)	-	-	-		
			> 5 ≤ 16	245	400 - 510	18 (200mm)	-	0 °C [47]	-		
			> 16 ≤ 40	235	400 - 510	22 (200mm)	-	0 °C [47]	-		
			> 40 ≤ 75	215	400 - 510	24 (50mm)	-	0 °C [47]	-		
			> 75 ≤ 100	215	400 - 510	24 (50mm)	-	0 °C [47]	-		
BS 4360 (1986)	40 A	5 - 80	≤ 16	235	340 - 500	22 (200mm) 25 (80mm) 25 (5.65VSo)	-	-	-	FOR WELDABLE STRUCTURAL STEEL	
			> 16 ≤ 40	225	340 - 500		-	-	-		
			> 40 ≤ 63	215	340 - 500		-	-	-		
			> 63 ≤ 100	205	340 - 500		-	-	-		
	40 B	5 - 80	≤ 16	235	340 - 500	22 (200mm) 25 (80mm) 25 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	225	340 - 500		-	20 °C [27]	-		
			> 40 ≤ 63	215	340 - 500		-	20 °C [27]	-		
			> 63 ≤ 100	205	340 - 500		-	20 °C [27]	-		
	40 C	5 - 80	≤ 16	235	340 - 500	22 (200mm) 25 (80mm) 25 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	225D	340 - 500		-	0 °C [27]	-		
			> 40 ≤ 63	215	340 - 500		-	0 °C [27]	-		
			> 63 ≤ 100	210	340 - 500		-	0 °C [27]	-		
	40 D	8 - 80	≤ 16	235	340 - 500	22 (200mm) 25 (80mm) 25 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	225	340 - 500		-	-20 °C [27]	-		
			> 40 ≤ 63	215	340 - 500		-	-20 °C [27]	-		
			> 63 ≤ 100	215	340 - 500		-	-20 °C [27]	-		
	43 A	5 - 80	≤ 16	275	430 - 580	20 (200mm) 23 (80mm) 22 (5.65VSo)	-	-	-		
			> 16 ≤ 40	265	430 - 580		-	-	-		
			> 40 ≤ 63	255	430 - 580		-	-	-		
			> 63 ≤ 100	245	430 - 580		-	-	-		
	43 B	5 - 80	≤ 16	275	430 - 580	20 (200mm) 23 (80mm) 22 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	265	430 - 580		-	20 °C [27]	-		
			> 40 ≤ 63	255	430 - 580		-	20 °C [27]	-		
			> 63 ≤ 100	245	430 - 580		-	20 °C [27]	-		
	43 C	5 - 80	≤ 16	275	430 - 580	20 (200mm) 23 (80mm) 22 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	265	430 - 580		-	0 °C [27]	-		
			> 40 ≤ 63	255	430 - 580		-	0 °C [27]	-		
			> 63 ≤ 100	245	430 - 580		-	0 °C [27]	-		
	43 D	8 - 80	≤ 16	275	430 - 580	20 (200mm) 23 (80mm) 22 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	265	430 - 580		-	-20 °C [27]	-		
			> 40 ≤ 63	255	430 - 580		-	-20 °C [27]	-		
			> 63 ≤ 100	245	430 - 580		-	-20 °C [27]	-		
DIN 17100 (1966)	ST 37.2	6 - 80	< 16	235	363 - 441	21 (200mm)	Bending 180° 1 x t	10 °C [27]	-	FOR GENERAL STRUCTURAL PURPOSES QUALITY SPECIFICATIONS	
			> 16 ≤ 25	225	363 - 441	21 (200mm)		10 °C [27]	-		
			> 25 ≤ 40	225	363 - 441	23 (200mm)		10 °C [27]	-		
			> 40	215	363 - 441	23 (200mm)		-	-		
	ST 42.2	6 - 80	< 16	255	412 - 490	18 (200mm)	Bending 180° 2 x t	20 °C [27]	-		
			> 16 ≤ 25	245	412 - 490	18 (200mm)		20 °C [27]	-		
			> 25 ≤ 40	245	412 - 490	20 (200mm)		20 °C [27]	-		
			> 40	235	412 - 490	20 (200mm)		20 °C [27]	-		

PRESSURE VESSEL - MILD STEEL

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
EN 10028-2 (2003)	P 235 GH	6 - 80	≤ 16	235	360 - 480	24 (5.65VSo)	-	-	20 °C [40] 0 °C [34] -20 °C [27]	NON-ALLOY & ALLOY STEELS WITH SPECIFIED ELEVATED TEMPERATURE PROPERTIES	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. EN 10028-3 (2003) 2. ASTM A 515 (2011) Grade: 60 Thick. range: > 50 ≤ 80 3. ASTM A 516 (2011) *Grade: 55 Thick. range: > 40 ≤ 80 *Grade: 60 Thick. range: > 40 ≤ 80 4. ASME SA 515 (2010, 2011a Addenda) Grade: 60 Thick. range: > 50 ≤ 80 5. ASME SA 516 (2010, 2011a Addenda) *Grade: 55 Thick. range: > 40 ≤ 80 *Grade: 60 Thick. range: > 40 ≤ 80
			> 16 ≤ 40	225	360 - 480	24 (5.65VSo)	-	-			
			> 40 ≤ 60	215	360 - 480	24 (5.65VSo)	-	-			
			> 60 ≤ 100	200	360 - 480	24 (5.65VSo)	-	-			
	P 265 GH	6 - 80	≤ 16	265	410 - 530	22 (5.65VSo)	-	-	20 °C [40] 0 °C [34] -20 °C [27]		
			> 16 ≤ 40	255	410 - 530	22 (5.65VSo)	-	-			
			> 40 ≤ 60	245	410 - 530	22 (5.65VSo)	-	-			
			> 60 ≤ 100	215	410 - 530	22 (5.65VSo)	-	-			
EN 10028-3 (2003)	P 275 NH	8 - 80	≤ 16	275	390 - 510	24 (5.65VSo)	-	20 °C [75], 0 °C [65] -20 °C [45]	20 °C [50] 0 °C [40] -20 °C [30]	WELDABLE FINE GRAIN STEELS, NORMALIZED	
			> 16 ≤ 40	265	390 - 510	24 (5.65VSo)	-				
			> 40 ≤ 60	255	390 - 510	24 (5.65VSo)	-	-			
			> 60 ≤ 100	235	370 - 490	23 (5.65VSo)	-	-			
	P 275 NL1	8 - 80	≤ 16	275	390 - 510	24 (5.65VSo)	-	20 °C [80], 0 °C [70], -20 °C [50], -40 °C [40], -50 °C [30]	20 °C [60] 0 °C [50] -20 °C [35] -40 °C [27]		
			> 16 ≤ 40	265	390 - 510	24 (5.65VSo)	-				
			> 40 ≤ 60	255	390 - 510	24 (5.65VSo)	-	-			
			> 60 ≤ 100	235	370 - 490	23 (5.65VSo)	-	-			
ASTM A 285 (2011)	A	5 - 50	-	165	310 - 450	27 (200mm), 30 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES, CARBON STEEL	
	B	5 - 50	-	185	345 - 485	25 (200mm), 28 (50mm)	-	-	-		
	C	5 - 50	-	205	380 - 515	23 (200mm), 27 (50mm)	-	-	-		
ASTM A 515 (2011)	60	5 - 80	< 25	220	415 - 550	21 (200mm), 25 (50mm)	-	-	-	FOR INTERMEDIATE & HIGHER TEMPERATURE SERVICE	
			> 25 ≤ 50	220	415 - 550		-	-	-		
			> 50 ≤ 100	220	415 - 550		-	-	-		
			> 100 ≤ 200	220	415 - 550		-	-	-		
ASTM A 516 (2011)	55	5 - 80	< 12.5	205	380 - 515	23 (200mm), 27 (50mm)	-	-	-	FOR MODERATE & LOWER TEMPERATURE SERVICE	
			> 12.5 ≤ 40	205	380 - 515		-	-	-		
			> 40 ≤ 50	205	380 - 515		-	-	-		
			> 50 ≤ 100	205	380 - 515		-	-	-		
			> 100 ≤ 200	205	380 - 515		-	-	-		
	60	5 - 80	< 12.5	220	415 - 550	21 (200mm), 25 (50mm)	-	-	-		
			> 12.5 ≤ 40	220	415 - 550		-	-	-		
			> 40 ≤ 50	220	415 - 550		-	-	-		
			> 50 ≤ 100	220	415 - 550		-	-	-		
			> 100 ≤ 200	220	415 - 550		-	-	-		
ASME SA 285 (2010, 2011a Addenda)	A	5 - 50	-	165	310 - 450	27 (200mm), 30 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES, CARBON STEEL	
	B	5 - 50	-	185	345 - 485	25 (200mm), 28 (50mm)	-	-	-		
	C	5 - 50	-	205	380 - 515	23 (200mm), 27 (50mm)	-	-	-		
ASME SA 414 (2010, 2011a Addenda)	A	≤ 7	≥ 1.5 < 2.2	170	310 - 415	23 (50mm)	-	-	-	FOR PRESSURE VESSEL	
			≥ 2.2 < 3.8	170	310 - 415	24 (50mm)	-	-	-		
			≥ 3.8 < 7	170	310 - 415	20 (200mm), 26 (50mm)	-	-	-		
	B	≤ 7	≥ 1.5 < 2.2	205	345 - 450	21 (50mm)	-	-	-		
			≥ 2.2 < 3.8	205	345 - 450	22 (50mm)	-	-	-		
			≥ 3.8 < 7	205	345 - 450	18 (200mm), 24 (50mm)	-	-	-		
ASME SA 414 (2010, 2011a Addenda)	C	≤ 7	≥ 1.5 < 2.2	230	380 - 485	19 (50mm)	-	-	-		
			≥ 2.2 < 3.8	230	380 - 485	20 (50mm)	-	-	-		
			≥ 3.8 < 7	230	380 - 485	16 (200mm), 22 (50mm)	-	-	-		
	D	≤ 7	≥ 1.5 < 2.2	240	415 - 515	17 (50mm)	-	-	-		
			≥ 2.2 < 3.8	240	415 - 515	18 (50mm)	-	-	-		
			≥ 3.8 < 7	240	415 - 515	14 (200mm), 20 (50mm)	-	-	-		
ASME SA 515 (2010, 2011a Addenda)	60	5 - 80	≤ 25	220	415 - 550	21 (200mm), 25 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES, CARBON STEEL	
			> 25 ≤ 50	220	415 - 550		-	-	-		
			> 50 ≤ 100	220	415 - 550		-	-	-		
ASME SA 516 (2010, 2011a Addenda)	55	5 - 80	≤ 12.5	205	380 - 515	23 (200mm), 27 (50mm)	-	-	-		
			> 12.5 ≤ 40	205	380 - 515		-	-	-		
			> 40 ≤ 50	205	380 - 515		-	-	-		
			> 50 ≤ 100	205	380 - 515		-	-	-		
	60	5 - 80	≤ 12.5	220	415 - 550	21 (200mm), 25 (50mm)	-	-	-		
			> 12.5 ≤ 40	220	415 - 550		-	-	-		
			> 40 ≤ 50	220	415 - 550		-	-	-		
			> 50 ≤ 100	220	415 - 550		-	-	-		

HIGH STRENGTH

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm^2)	UTS (N/mm^2)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
EN 10025-2 (2004)	S 355 JR+AR	6 - 120	< 3	355	510 - 680	16 (80mm)	-	-	-	FOR NON-ALLOY STRUCTURAL STEELS	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. EN 10025-3 (2004) Grade: S 355 NL
			> 3 ≤ 16	355	470 - 630	20 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	345	470 - 630	20 (5.65VSo)	-	20 °C [27]	-		
			> 40 ≤ 63	335	470 - 630	19 (5.65VSo)	-	20 °C [27]	-		
			> 63 ≤ 80	325	470 - 630	18 (5.65VSo)	-	20 °C [27]	-		
			> 80 ≤ 100	315	470 - 630	18 (5.65VSo)	-	20 °C [27]	-		
			> 100 ≤ 150	295	450 - 600	18 (5.65VSo)	-	20 °C [27]	-		
	S 355 JO+AR	6 - 120	< 3	355	510 - 680	16 (80mm)	-	-	-		
			> 3 ≤ 16	355	470 - 630	20 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	345	470 - 630	20 (5.65VSo)	-	0 °C [27]	-		
			> 40 ≤ 63	335	470 - 630	19 (5.65VSo)	-	0 °C [27]	-		
			> 63 ≤ 80	325	470 - 630	18 (5.65VSo)	-	0 °C [27]	-		
			> 80 ≤ 100	315	470 - 630	18 (5.65VSo)	-	0 °C [27]	-		
			> 100 ≤ 150	295	450 - 600	18 (5.65VSo)	-	0 °C [27]	-		
	S 355 J2+N	6 - 120	< 3	355	510 - 680	16 (80mm)	-	-	-		
			> 3 ≤ 16	355	470 - 630	20 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	345	470 - 630	20 (5.65VSo)	-	-20 °C [27]	-		
			> 40 ≤ 63	335	470 - 630	19 (5.65VSo)	-	-20 °C [27]	-		
			> 63 ≤ 80	325	470 - 630	18 (5.65VSo)	-	-20 °C [27]	-		
			> 80 ≤ 100	315	470 - 630	18 (5.65VSo)	-	-20 °C [27]	-		
			> 100 ≤ 150	295	450 - 600	18 (5.65VSo)	-	-20 °C [27]	-		
	S 355 K2+N	6 - 120	< 3	355	510 - 680	16 (80mm)	-	-	-		
			> 3 ≤ 16	355	470 - 630	20 (5.65VSo)	-	-20 °C [40]	-		
			> 16 ≤ 40	345	470 - 630	20 (5.65VSo)	-	-20 °C [40]	-		
			> 40 ≤ 63	335	470 - 630	19 (5.65VSo)	-	-20 °C [40]	-		
			> 63 ≤ 80	325	470 - 630	18 (5.65VSo)	-	-20 °C [40]	-		
			> 80 ≤ 100	315	470 - 630	18 (5.65VSo)	-	-20 °C [40]	-		
			> 100 ≤ 150	295	450 - 600	18 (5.65VSo)	-	-20 °C [40]	-		
EN 10025-3 (2004)	S 355 NL	8 - 80	≤ 16	355	470 - 630	22 (5.65VSo)	-	20°C [63], 0°C [55]	-	NON ALLOY & ALLOY STEELS WITH SPECIFIED ELEVATED TEMPERATURE PROPERTIES	
			> 16 ≤ 40	345	470 - 630	22 (5.65VSo)	-	-10°C [51], -20°C [47]	-		
			> 40 ≤ 63	335	470 - 630	22 (5.65VSo)	-	-30°C [40], -40°C [31],	-		
			> 63 ≤ 80	325	470 - 630	23 (5.65VSo)	-	-50°C [27]	-		
ASTM A 573 (2011)	70	6 - 40	≤ 13	290	485 - 620	18 (200mm)	-	-	-	-	
			> 13 ≤ 40	290	485 - 620	21 (50mm)	-	-	-		
JIS G 3101 (2011)	SS 490	6 - 80	≤ 5	285	490 - 610	19 (50mm)	Bending 180° 2 x t	-	-	FOR GENERAL STRUCTURE	
			> 5 ≤ 16	285	490 - 610	15 (200mm)		-	-		
			>16 ≤ 40	275	490 - 610	19 (200mm)		-	-		
			>40 ≤ 100	255	490 - 610	21 (50mm)		-	-		
	SS 540	≤ 40	≤ 5	400	540 min	16 (50mm)	Bending 180° 2 x t	-	-		
			> 5 ≤ 16	400	540 min	13 (200mm)		-	-		
			>16 ≤ 40	390	540 min	17 (200mm)		-	-		
JIS G 3106 (2011)	SM 490 A	6 - 100	≤ 5	325	490 - 610	22 (50mm)	-		-		
			> 5 ≤ 16	325	490 - 610	17 (200mm)	-	-	-		
			> 16 ≤ 40	315	490 - 610	21 (200mm)	-	-	-		
			> 40 ≤ 75	295	490 - 610	23 (50mm)	-	-	-		
			> 75 ≤ 100	295	490 - 610	23 (50mm)	-	-	-		
	SM 490 B	6 - 100	≤ 5	325	490 - 610	22 (50mm)	-	-	-		
			> 5 ≤ 16	325	490 - 610	17 (200mm)	-	0 °C [27]	-		
			> 16 ≤ 40	315	490 - 610	21 (200mm)	-	0 °C [27]	-		
			> 40 ≤ 75	295	490 - 610	23 (50mm)	-	0 °C [27]	-		
			> 75 ≤ 100	295	490 - 610	23 (50mm)	-	0 °C [27]	-		
	SM 490 C	6 - 100	≤ 5	325	490 - 610	22 (50mm)	-	-	-		
			> 5 ≤ 16	325	490 - 610	17 (200mm)	-	0 °C [47]	-		
			> 16 ≤ 40	315	490 - 610	21 (200mm)	-	0 °C [47]	-		
			> 40 ≤ 75	295	490 - 610	23 (50mm)	-	0 °C [47]	-		
			> 75 ≤ 100	295	490 - 610	23 (50mm)	-	0 °C [47]	-		

HIGH STRENGTH

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
JIS G 3106 (2011)	SM 490 YA	6 - 100	≤ 5	365	490 - 610	19 (50mm)	-	-	-	FOR WELDED STRUCTURE	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. DIN 17100 (1966)
			> 5 ≤ 16	365	490 - 610	15 (200mm)	-	-	-		
			> 16 ≤ 40	355	490 - 610	19 (200mm)	-	-	-		
			> 40 ≤ 75	335	490 - 610	21 (50mm)	-	-	-		
			> 75 ≤ 100	325	490 - 610	21 (50mm)	-	-	-		
	SM 490 YB	6 - 100	≤ 5	365	490 - 610	19 (50mm)	-	-	-		
			> 5 ≤ 16	365	490 - 610	15 (200mm)	-	0 °C [27]	-		
			> 16 ≤ 40	355	490 - 610	19 (200mm)	-	0 °C [27]	-		
			> 40 ≤ 75	335	490 - 610	21 (50mm)	-	0 °C [27]	-		
			> 75 ≤ 100	325	490 - 610	21 (50mm)	-	0 °C [27]	-		
	SM 520 B	6 - 25	≤ 5	365	520 - 640	19 (50mm)	-	-	-		
			> 5 ≤ 16	365	520 - 640	15 (200mm)	-	0 °C [27]	-		
			> 16 ≤ 40	355	520 - 640	19 (200mm)	-	0 °C [27]	-		
JIS G 3106 (2011)	SM 520 C	6 - 25	≤ 5	365	520 - 640	19 (50mm)	-	-	-		
			> 5 ≤ 16	365	520 - 640	15 (200mm)	-	0 °C [47]	-		
DIN 17100 (1966)	ST 52.3	8 - 80	≤ 16	355	510 - 608	20 (200mm)	180°/2 x t	-20 °C [27]	-	FOR GENERAL STRUCTURAL PURPOSES	
			> 16 ≤ 30	345	510 - 608	20 (200mm)	180°/3 x t	-20 °C [27]	-		
			> 30	335	510 - 608	20 (200mm)	180°/3 x t	-20 °C [27]	-		
API 5L PSL 1 Welded Pipe (2007)	X 42	8 - 25	≤ 25	290 min	415 min	-	-	-	-		
	X 46	8 - 25	≤ 25	320 min	435 min	-	-	-	-		
	X 52	8 - 25	≤ 25	360 min	460 min	-	-	-	-		
	X 56	8 - 25	≤ 25	390 min	490 min	-	-	-	-		
	X 60	8 - 25	≤ 25	415 min	520 min	-	-	-	-		
	X 65	8 - 25	≤ 25	450 min	535 min	-	-	-	-		
	X 70	8 - 25	≤ 25	485 min	570 min	-	-	-	-		
API 5L PSL 2 Welded Pipe	X 42M	8 - 30	≤ 25	290 - 495	415 - 760	-	-	0 °C [27]	-		
	X 46M	8 - 30	≤ 25	320 - 525	435 - 760	-	-	0 °C [27]	-		
	X 52M	8 - 30	≤ 25	360 - 530	460 - 760	-	-	0 °C [27]	-		
	X 56M	8 - 30	≤ 25	390 - 545	490 - 760	-	-	0 °C [27]	-		
	X 60M	8 - 30	≤ 25	415 - 565	520 - 760	-	-	0 °C [27]	-		
	X 65M	8 - 30	≤ 25	450 - 600	535 - 760	-	-	0 °C [27]	-		
	X 70M	8 - 30	≤ 25	485 - 635	570 - 760	-	-	0 °C [27]	-		

HIGH CARBON

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
ASTM 830 TO SAE	1045	≤ 80	-	-	-	-	-	-	-	FOR PLATES, CARBON STEEL, STRUCTURAL QUALITY, FURNISHED TO CHEMICAL COMPOSITION REQUIREMENTS	-

PRESSURE VESSEL - HIGH STRENGTH

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm^2)	UTS (N/mm^2)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
EN 10028-2 (2003)	P 295 GH	6 - 80	≤ 16	295	460 - 580	21 (5.65VSo)	-	-	20 °C [40] 0 °C [34] -20 °C [27]	NON ALLOY & ALLOY STEELS WITH SPECIFIED ELEVATED TEMPERATURE PROPERTIES	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. EN 10028-3 (2003) 2. ASTM A 515 (2011) thick.range: > 50 ≤ 80 3. ASTM A 516 (2011) thick.range: > 40 ≤ 80 4. ASTM A 537 (2011) 5. ASME SA 515 thick.range: > 50 ≤ 80
			> 16 ≤ 40	290	460 - 580	21 (5.65VSo)	-	-			
			> 40 ≤ 60	285	460 - 580	21 (5.65VSo)	-	-			
			> 60 ≤ 100	260	460 - 580	21 (5.65VSo)	-	-			
	P 355 GH	6 - 80	≤ 16	355	510 - 650	20 (5.65VSo)	-	-	20 °C [40] 0 °C [34] -20 °C [27]		
			> 16 ≤ 40	345	510 - 650	20 (5.65VSo)	-	-			
			> 40 ≤ 60	335	510 - 650	20 (5.65VSo)	-	-			
			> 60 ≤ 100	315	490 - 630	20 (5.65VSo)	-	-			
EN 10028-3 (2003)	P 355 NH	8 - 80	≤ 16	355	490 - 630	22 (5.65VSo)	-	20 °C [75], 0 °C [65] -20 °C [45]	20 °C [50] 0 °C [40] -20 °C [30]	WELDABLE FINE GRAIN STEELS, NORMALIZED	
			> 16 ≤ 40	345	490 - 630	22 (5.65VSo)	-				
			> 40 ≤ 60	335	490 - 630	22 (5.65VSo)	-	-			
			> 60 ≤ 100	315	470 - 610	21 (5.65VSo)	-	-			
	P 355 NL1	8 - 80	≤ 16	355	490 - 630	22 (5.65VSo)	-	20 °C [50], 0 °C [70], -20 °C [50], -40 °C [40], -50 °C [30]	20 °C [60] 0 °C [50] -20 °C [35] -40 °C [27]		
			> 16 ≤ 40	345	490 - 630	22 (5.65VSo)	-				
			> 40 ≤ 60	335	490 - 630	22 (5.65VSo)	-	-			
			> 60 ≤ 100	315	470 - 610	21 (5.65VSo)	-	-			
ASTM A 515 (2011)	65	6 - 80	≤ 25	240	450 - 585	19 (200mm), 23 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES, CARBON STEEL, FOR INTERMEDIATE AND HIGHER TEMPERATURE SERVICE	
			> 25 ≤ 50	240	450 - 585		-	-	-		
			> 50 ≤ 100	240	450 - 585		-	-	-		
			> 100 ≤ 200	240	450 - 585		-	-	-		
	70	6 - 80	≤ 25	260	485 - 620	17 (200mm), 21 (50mm)	-	-	-		
			> 25 ≤ 50	260	485 - 620		-	-	-		
			> 50 ≤ 100	260	485 - 620		-	-	-		
			> 100 ≤ 200	260	485 - 620		-	-	-		
ASTM A 516 (2011)	65	6 - 80	≤ 12.5	240	450 - 585	19 (200mm), 23 (50mm)	-	-	-		
			> 12.5 ≤ 40	240	450 - 585		-	-	-		
			> 40 ≤ 50	240	450 - 585		-	-	-		
			> 50 ≤ 100	240	450 - 585		-	-	-		
			> 100 ≤ 200	240	450 - 585		-	-	-		
	70	6 - 80	≤ 12.5	260	485 - 620	17 (200mm), 21 (50mm)	-	-	-		
			> 12.5 ≤ 40	260	485 - 620		-	-	-		
			> 40 ≤ 50	260	485 - 620		-	-	-		
			> 50 ≤ 100	260	485 - 620		-	-	-		
			> 100 ≤ 200	260	485 - 620		-	-	-		
ASTM A 537 (2011)	Class 1	8 - 60	≤ 40	345	485 - 620	18 (200mm), 22 (50mm)	-	-	-		
			> 40 ≤ 65	345	485 - 620		-	-	-		
			> 65 ≤ 100	310	450 - 585		-	-	-		
ASME SA 414 (2010, 2011a Addenda)	E	≤ 7	≥ 1.5 < 2.2	260	450 - 585	15 (50mm)	-	-	-	FOR STEEL, SHEET, CARBON, FOR PRESSURE VESSEL	
			≥ 2.2 < 3.8	260	450 - 585	16 (50mm)	-	-	-		
			≥ 3.8 < 7	260	450 - 585	12 (200mm), 18 (50mm)	-	-	-		
	F	≤ 7	≥ 1.5 < 2.2	290	485 - 620	13 (50mm)	-	-	-		
			≥ 2.2 < 3.8	290	485 - 620	14 (50mm)	-	-	-		
			≥ 3.8 < 7	290	485 - 620	10 (200mm), 16 (50mm)	-	-	-		
	G	≤ 7	≥ 1.5 < 2.2	310	515 - 655	13 (50mm)	-	-	-		
			≥ 2.2 < 3.8	310	515 - 655	14 (50mm)	-	-	-		
			≥ 3.8 < 7	310	515 - 655	10 (200mm), 16 (50mm)	-	-	-		
ASME SA 515 (2010, 2011a Addenda)	65	6 - 80	≤ 25	240	450 - 585	19 (200mm), 23 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES, CARBON STEEL, FOR INTERMEDIATE & HIGHER TEMPERATURE SERVICE	
			> 25 ≤ 50	240	450 - 585		-	-	-		
			> 50 ≤ 100	240	450 - 585		-	-	-		
	70	6 - 80	≤ 25	260	485 - 620	17 (200mm), 21 (50mm)	-	-	-		
			> 25 ≤ 50	260	485 - 620		-	-	-		
			> 50 ≤ 100	260	485 - 620		-	-	-		

PRESSURE VESSEL - HIGH STRENGTH

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
ASME SA 516 (2010, 2011a Addenda)	65	6 - 80	≤ 12.5	240	450 - 585	19 (200mm), 23 (50mm)	-	-	-	FOR MODERATE AND LOWER TEMPERATURE SERVICE	- Product below with NORMALIZED: 1. ASME SA 516 thick.range: > 40 ≤ 80 2. ASME SA 537
			> 12.5 ≤ 40	240	450 - 585		-	-	-		
			> 40 ≤ 50	240	450 - 585		-	-	-		
			> 50 ≤ 100	240	450 - 585		-	-	-		
	70	6 - 80	≤ 12.5	260	485 - 620	17 (200mm), 21 (50mm)	-	-	-		
			> 12.5 ≤ 40	260	485 - 620		-	-	-		
			> 40 ≤ 50	260	485 - 620		-	-	-		
			> 50 ≤ 100	260	485 - 620		-	-	-		
ASME SA 537	Class 1	8 - 60	≤ 40	345	485 - 620	18 (200mm), 22 (50mm)	-	-	-	FOR PRESSURE VESSEL PLATES	
			> 40 ≤ 65	345	485 - 620		-	-	-		

SHIP BUILDING PLATE

Specification	Grade	Product Thickness (mm)	Mechanical Properties						Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (TR)		
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		Average Temp (Joule)		
A.B.S.	D	-50	-	235	400 - 520	22 (5.65 VSo)	-	-20° [27]	For thick up to 25 mm, no impact test for grade B only Steel Plates For Use in Ship Construction	- For ABS GR AH/DH/EH/FH36 can supply with Z35. - For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10').
	A	-50	-	235	400 - 520	22 (5.65 VSo)	-	-		
	B	-50	-	235	400 - 520	22 (5.65 VSo)	-	0° [27]		
	AH36	≤ 50	-	355	490 - 620	21 (5.65 VSo)	-	0° [34]		
		> 50 ≤ 60	-	355	490 - 620	21 (5.65 VSo)	-	0° [41]		
	DH36	≤ 50	-	355	490 - 620	21 (5.65 VSo)	-	-20° [34]		
		> 50 ≤ 60	-	355	490 - 620	21 (5.65 VSo)	-	-20° [41]		
	EH36	≤ 50	-	355	490 - 620	21 (5.65 VSo)	-	-40° [34]		
		> 50 ≤ 60	-	355	490 - 620	21 (5.65 VSo)	-	-40° [41]		
	FH36	≤ 50	-	355	490 - 620	21 (5.65 VSo)	-	-60° [34]		
		> 50 ≤ 60	-	355	490 - 620	21 (5.65 VSo)	-	-60° [41]		
	AH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	0° [39]		
	DH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	-20° [39]		
	EH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	-40° [39]		
B.K.I.	A	-50	-	235	400 - 520	22 (5.65 VSo)	-	-	Steel Plates For Use In Ship Construction	
	B	50	-	235	400 - 520	22 (5.65 VSo)	-	0° [20]		
	B	50<t≤70	-	235	400 - 520	22 (5.65 VSo)	-	0° [24]		
	B	70<t≤100	-	235	400 - 520	22 (5.65 VSo)	-	0° [27]		
	D	50	-	235	400 - 520	22 (5.65 VSo)	-	-20° [20]		
	D	50<t≤70	-	235	400 - 520	22 (5.65 VSo)	-	-20° [24]		
	D	70<t≤100	-	235	400 - 520	22 (5.65 VSo)	-	-20° [27]		
	E	50	-	235	400 - 520	22 (5.65 VSo)	-	-40° [20]		
	E	50<t≤70	-	235	400 - 520	22 (5.65 VSo)	-	-40° [24]		
	E	70<t≤100	-	235	400 - 520	22 (5.65 VSo)	-	-40° [27]		
	A32	50	-	315	440 - 570	22 (5.65 VSo)	-	0° [22]		
	A32	50<t≤70	-	315	440 - 570	22 (5.65 VSo)	-	0° [26]		
	A32	70<t≤100	-	315	440 - 570	22 (5.65 VSo)	-	0° [31]		
	D32	50	-	315	440 - 570	22 (5.65 VSo)	-	-20° [22]		
	D32	50<t≤70	-	315	440 - 570	22 (5.65 VSo)	-	-20° [26]		
	D32	70<t≤100	-	315	440 - 570	22 (5.65 VSo)	-	-20° [31]		
	E32	50	-	315	440 - 570	22 (5.65 VSo)	-	-40° [22]		
	E32	50<t≤70	-	315	440 - 570	22 (5.65 VSo)	-	-40° [26]		
	E32	70<t≤100	-	315	440 - 570	22 (5.65 VSo)	-	-40° [31]		
	F32	50	-	315	440 - 570	22 (5.65 VSo)	-	-60° [22]		
	F32	50<t≤70	-	315	440 - 570	22 (5.65 VSo)	-	-60° [26]		
	F32	70<t≤100	-	315	440 - 570	22 (5.65 VSo)	-	-60° [31]		
	A36	50	-	355	490 - 630	21 (5.65 VSo)	-	0° [24]		
	A36	50<t≤70	-	355	490 - 630	21 (5.65 VSo)	-	0° [27]		
	A36	70<t≤100	-	355	490 - 630	21 (5.65 VSo)	-	0° [34]		
	D36	50	-	355	490 - 630	21 (5.65 VSo)	-	-20° [24]		
	D36	50<t≤70	-	355	490 - 630	21 (5.65 VSo)	-	-20° [27]		
	D36	70<t≤100	-	355	490 - 630	21 (5.65 VSo)	-	-20° [34]		

SHIP BUILDING PLATE

Specification	Grade	Product Thickness (mm)	Mechanical Properties						Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (TR)		
				YS min. (N/mm²)	UTS (N/mm²)	E min. (%)		Average Temp (Joule)		
B.K.I	E36	50	-	355	490 - 630	21 (5.65 VSo)	-	-40° [24]	Steel Plates For Use In Ship Construction	- For ABS GR AH/DH/ EH/FH36 can supply with Z35. - For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10').
	E36	50<t≤70	-	355	490 - 630	21 (5.65 VSo)	-	-40° [27]		
	E36	70<t≤100	-	355	490 - 630	21 (5.65 VSo)	-	-40° [34]		
	F36	50	-	355	490 - 630	22 (5.65 VSo)	-	-60° [24]		
	F36	50<t≤70	-	355	490 - 630	21 (5.65 VSo)	-	-60° [27]		
	F36	70<t≤100	-	355	490 - 630	21 (5.65 VSo)	-	-60° [34]		
	A40	50	-	390	510 - 660	20 (5.65 VSo)	-	0° [26]		
	A40	50<t≤70	-	390	510 - 660	20 (5.65 VSo)	-	0° [31]		
	A40	70<t≤100	-	390	510 - 660	20 (5.65 VSo)	-	0° [37]		
	D40	50	-	390	510 - 660	20 (5.65 VSo)	-	-20° [26]		
	D40	50<t≤70	-	390	510 - 660	20 (5.65 VSo)	-	-20° [31]		
	D40	70<t≤100	-	390	510 - 660	20 (5.65 VSo)	-	-20° [37]		
	E40	50	-	390	510 - 660	20 (5.65 VSo)	-	-40° [26]		
	E40	50<t≤70	-	390	510 - 660	20 (5.65 VSo)	-	-40° [31]		
	E40	70<t≤100	-	390	510 - 660	20 (5.65 VSo)	-	-40° [37]		
	F40	50	-	390	510 - 660	20 (5.65 VSo)	-	-60° [26]		
	F40	50<t≤70	-	390	510 - 660	20 (5.65 VSo)	-	-60° [31]		
	F40	70<t≤100	-	390	510 - 660	20 (5.65 VSo)	-	-60° [37]		
L.R.	A	-50	-	235	400 - 520	22 (5.65 VSo)	-	-	For thick up to 25 mm, no impact test for grade B only Steel Plates For Use In Ship Construction	
	B	-50	-	235	400 - 520	22 (5.65 VSo)	-	0° [27]		
	AH36	8 - 50	-	255	490 - 620	21 (5.65 VSo)	-	0° [34]		
	DH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	-20° [34]		
	EH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	-40° [34]		
	AH40	8 - 50	-	390	510 - 650	20 (5.65 VSo)	-	0° [39]		
	DH40	8 - 50	-	390	510 - 650	20 (5.65 VSo)	-	-20° [39]		
	EH40	8 - 50	-	390	510 - 650	20 (5.65 VSo)	-	-40° [39]		
	360 AR	- 40	-	190	360 - 480	24 (5.65 VSo)	-	-		
	410 AR	- 40	-	215	410 - 530	22 (5.65 VSo)	-	-		
G.L.	A	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-	For thick up to 25 mm, no impact test for grade B only Steel Plates For Use In Ship Construction	
	B	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	0° [27]		
	D	8 - 25	-	235	400 - 520	22 (5.65 VSo)	-	-20° [27]		
	AH32	8 - 50	-	315	440 - 570	22 (5.65 VSo)	-	0° [31]		
	DH32	8 - 50	-	315	440 - 570	22 (5.65 VSo)	-	-20° [31]		
	AH36	8 - 50	-	355	490 - 630	21 (5.65 VSo)	-	0° [34]		
	DH36	8 - 50	-	355	490 - 630	21 (5.65 VSo)	-	-20° [34]		
	AH40	8 - 12	-	390	510 - 660	20 (5.65 VSo)	-	0° [41]		
	DH40	8 - 12	-	390	510 - 660	20 (5.65 VSo)	-	-20° [41]		
B.V.	A	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-	For thick up to 25 mm, no impact test for grade B only Steel Plates For Use In Ship Construction	
	B	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-0° [27]		
	D	8 - 35	-	235	400 - 520	22 (5.65 VSo)	-	-20° [27]		
	AH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	0° [34]		
	DH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	-20° [34]		
	EH36	8 - 30	-	355	490 - 620	21 (5.65 VSo)	-	-40° [34]		
	AH40	8 - 30	-	390	510 - 660	20 (5.65 VSo)	-	0° [39]		
	DH40	8 - 30	-	390	510 - 660	20 (5.65 VSo)	-	-20° [39]		
	EH40	8 - 30	-	390	510 - 660	20 (5.65 VSo)	-	-40° [39]		
D.N.V.	A	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-	For thick up to 25 mm, no impact test for grade B only Steel Plates For Use In Ship Construction	
	B	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-0° [27]		
	D	8 - 50	-	235	400 - 520	22 (5.65 VSo)	-	-20° [27]		
	AH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	0° [34]		
	DH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	-20° [34]		
	EH36	8 - 50	-	355	490 - 620	21 (5.65 VSo)	-	-40° [34]		
	AH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	0° [41]		
	DH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	-20° [41]		
	EH40	8 - 30	-	390	510 - 650	20 (5.65 VSo)	-	-40° [41]		
N.K	A	-50	-50	235	400 - 520	22 (5.65 VSo)	-	-	-	
	B	-50	-50	235	400 - 520	22 (5.65 VSo)	-	0° [20]		
	D	-50	-50	235	400 - 520	22 (5.65 VSo)	-	-20° [20]		
	AH36	8 - 50	8 - 50	355	490 - 620	21 (5.65 VSo)	-	0° [24]		
	DH36	8 - 50	8 - 50	355	490 - 620	21 (5.65 VSo)	-	-20° [24]		

HIGH STRENGTH LOW ALLOY

Specification	Grade	Product Thickness (mm)	Mechanical Properties							Application	Remarks
			Thickness Range (mm)	Tensile Test (TR)			Bend Test	Impact Test (LG)			
				YS min. (N/mm^2)	UTS (N/mm^2)	E min. (%)		LG (Average Temp.)	TR (Average Temp.)		
AS 3678	350	6 - 120	≤ 8	360	450 min	20 (5.65VSo)	-	-	-	STRUCTURAL STEEL HOT ROLLED PLATES, FLOORPLATES AND SLABS	- For thickness below than 8mm, max width is 1,524mm (5'); above than 8mm, max width is 3,048mm (10'). - For thickness more than 80mm can be supplied without mill certificate. - Max. length is 15,000mm. However the final sizes are subject to reconfirm by our mill. - Shotblasting and primer shop are available, with max. width 3,048mm (10'). - Product below with NORMALIZED: 1. BS 4360 (1986) Grade : 50 D & 50 DD 2. API 2H
			> 8 ≤ 12	360	450 min	20 (5.65VSo)	-	-	-		
			> 12 ≤ 20	350	450 min	20 (5.65VSo)	-	-	-		
			> 20 ≤ 32	340	450 min	20 (5.65VSo)	-	-	-		
			> 32 ≤ 50	340	450 min	20 (5.65VSo)	-	-	-		
			> 50 ≤ 80	340	450 min	20 (5.65VSo)	-	-	-		
			> 80 ≤ 150	330	450 min	20 (5.65VSo)	-	-	-		
	400	6 - 80	≤ 8	400	480 min	18 (5.65VSo)	-	-	-		
			> 8 ≤ 12	400	480 min	18 (5.65VSo)	-	-	-		
			> 12 ≤ 20	380	480 min	18 (5.65VSo)	-	-	-		
			> 20 ≤ 32	360	480 min	18 (5.65VSo)	-	-	-		
			> 32 ≤ 50	360	480 min	18 (5.65VSo)	-	-	-		
			> 50 ≤ 80	360	480 min	18 (5.65VSo)	-	-	-		
	450	6 - 50	≤ 8	450	520 min	16 (5.65VSo)	-	-	-		
			> 8 ≤ 12	450	520 min	16 (5.65VSo)	-	-	-		
			> 12 ≤ 20	450	520 min	16 (5.65VSo)	-	-	-		
			> 20 ≤ 32	420	500 min	18 (5.65VSo)	-	-	-		
			> 32 ≤ 50	400	500 min	18 (5.65VSo)	-	-	-		
ASTM A 572 (2011)	42	6 - 150	≤ 40	290	415 min	20 (200mm), 24 (50mm)	-	-	-	FOR HIGH STRENGTH LOW ALLOY COLUMBIUM VANADIUM STRUCTURAL STEEL	
			> 40	290	415 min		-	-	-		
	50	6 - 100	≤ 40	345	450 min	18 (200mm), 21 (50mm)	-	-	-		
			> 40	345	450 min		-	-	-		
	60	-	-	415	520	16 (200mm)	-	-	-		
	65	-	-	450	550	15 (200mm)	-	-	-		
ASTM A 709 (2011)	50	6 - 80	≤ 40	345	450 min	18 (200mm), 21 (50mm)	-	-	-	FOR STRUCTURAL STEEL FOR BRIDGES	
			> 40	345	450 min	18 (200mm), 21 (50mm)	-	-	-		
ASME SA 572 (2010, 2011a Addenda)	42	6 - 150	≤ 40	290	415 min	20 (200mm), 24 (50mm)	-	-	-	FOR HIGH STRENGTH LOW ALLOY COLUMBIUM VANADIUM STRUCTURAL STEEL	
			> 40	290	415 min		-	-	-		
	50	6 - 100	≤ 40	345	450 min	18 (200mm) 21 (50mm)	-	-	-		
			> 40	345	450 min		-	-	-		
BS 4360 (1986)	50 A	6 - 80	≤ 16	355	490 - 640	18 (200mm) 20 (80mm) 20 (5.65VSo)	-	-	-	FOR WELDABLE STRUCTURAL STEEL	
			> 16 ≤ 40	345	490 - 640		-	-	-		
			> 40 ≤ 63	340	490 - 640		-	-	-		
			> 63 ≤ 100	325	480 - 640		-	-	-		
	50 B	6 - 80	≤ 16	355	490 - 640	18 (200mm) 20 (80mm) 20 (5.65VSo)	-	20 °C [27]	-		
			> 16 ≤ 40	345	490 - 640		-	20 °C [27]	-		
			> 40 ≤ 63	340	490 - 640		-	20 °C [27]	-		
			> 63 ≤ 100	325	480 - 640		-	20 °C [27]	-		
	50 C	6 - 80	≤ 16	355	490 - 640	18 (200mm) 20 (80mm) 20 (5.65VSo)	-	0 °C [27]	-		
			> 16 ≤ 40	345	490 - 640		-	0 °C [27]	-		
			> 40 ≤ 63	340	490 - 640		-	0 °C [27]	-		
			> 63 ≤ 100	325	480 - 640		-	0 °C [27]	-		
BS 4360 (1986)	50 D	8 - 80	≤ 16	355	490 - 640	18 (200mm) 20 (80mm) 20 (5.65VSo)	-	-20 °C [27]	-		
			> 16 ≤ 40	345	490 - 640		-	-20 °C [27]	-		
			> 40 ≤ 63	340	490 - 640		-	-20 °C [27]	-		
			> 63 ≤ 100	325	480 - 640		-	-20 °C [27]	-		
	50 DD	8 - 80	≤ 16	355	490 - 640	18 (200mm) 20 (80mm) 20 (5.65VSo)	-	-30 °C [27]	-		
			> 16 ≤ 40	345	490 - 640		-	-30 °C [27]	-		
			> 40 ≤ 63	340	490 - 640		-	-30 °C [27]	-		
			> 63 ≤ 100	325	480 - 640		-	-30 °C [27]	-		
API 2H	42	-	≤ 63.5	289	427 - 565	18 (200mm), 22 (50mm)	-	-40 °C [34]	-	OFFSHORE STRUCTURES	
	50	-	≤ 63.5	345	483 - 620	16 (200mm), 21 (50mm)	-	-40 °C [41]	-		

Hot Rolled Coil

A widely used product under our production line is the Hot Rolled Coil. Our Hot Rolled Coil is produced from the best steel slabs we can source, where it is heated to over its recrystallization temperature and rolled into flat steel while it is still in this high temperature to right thickness size before it is rolled into coils.

To ensure better quality control during the rolling process, we use the upward coiling machine. This method give us the ability to ensure that both sides of the steel are carefully inspected to complied with our certified standard.

Our Hot Rolled Coils have been used a range applications such as, welded steel structural beams, storage tanks, flanges, and welded pipe where strength is required.

Standard & Specification	:	ASTM A-36, ASTM A-572, JIS G 3101, JIS G 3131
Available Size	:	Thickness 2mm - 20mm, Width 900mm - 1524mm, Maximum 25 MT/Coil
Annual Capacity	:	1.200.000 MT/Year

Specification	Grade	Product Thickness (mm)	Thickness Range (mm)	Tensile Test			Bend Test	Impact Test Average Temp. (Joule)	Application	Remarks
				YS Min. (N/mm^2)	UTS (N/mm^2)	E Min. (%)				
	SPHC	2 - 16	1.6 < 2			29 (50mm)				
			2 < 2.5			29 (50mm)	flat on itself			
			2.5 < 3.2	-	270 min	29 (50mm)		-	Commercial Quality Drawing Purpose	For the width of 1524mm (5") the min. thickness is 5mm
			3.2 < 4			31 (50mm)	0.5 x T			
JIS G 3131			≥4			31 (50mm)				
	SPHD	2 - 16	2 < 2.5			33 (50mm)				
			2.5 < 3.2	-	270 min	35 (50mm)		-	Drawing Quality Cold Rollable	
			3.2 < 4			37 (50mm)				
			≥4			39 (50mm)				
	SPHT - 1	2 - 13	1.6 < 3			32 (50mm)	flat on itself			
			3 < 6	-	270 min	35 (50mm)	Over 3mm	-	Welded Steel Pipes & Tubes	
			6 ≤ 13			37 (50mm)	0.5 x T			
	SPHT - 2	2 - 13	1.6 < 3			27 (50mm)	1.0 x T			
JIS G 3132			3 < 6	-	340 min	30 (50mm)	Over 3mm	-	Welded Steel Pipes & Tubes	
			6 ≤ 13			32 (50mm)	1.5 x T			
	SPHT - 3	1.6 - 13	1.6 < 3			22 (50mm)	1.5 x T			
			3 < 6	-	410 min	25 (50mm)	Over 3mm	-	Welded Steel Pipes & Tubes	
			6 ≤ 13			27 (50mm)	2.0 x T			
	SS 400	2 - 20	≤ 5			21 (50mm)	Bending			
JIS G 3101			> 5 ≤ 16	245	400 - 510	17 (200mm)	180°	-	For General Structure	
			16 ≤ 40	235		21 (200mm)	1.5 x T			
JIS G 3116	S G 255	2 - 3	2 ≥ 3	255	400	28 (50mm)	180° 1.0 x T	-	For LPG Cylinder	
	SAPH 400	2 - 14	2.5 < 3.15			34 (50mm)	Bending			
	(41)		3.15 < 4	255	400	35 (50mm)	180°	-	Structure For Automobile	
			4 < 6.3			36 (50mm)				
			≥ 6.3	235		24 (200mm)	1.0 x T			
	SAPH 440	4 - 14	4 < 6	305		34 (50mm)	Bending			
JIS G 3113	(45)		6 < 6.3	295	440	34 (50mm)		-	Structure For Automobile	
			6.3 < 8	295		22 (200mm)	180°			
			≥ 8 < 14	275		22 (200mm)	1.5 x T			

Specification	Grade	Product Thickness (mm)	Thickness Range (mm)	Tensile Test			Bend Test	Impact Test Average Temp. (Joule)	Application	Remarks
				YS Min. (N/mm^2)	UTS (N/mm^2)	E Min. (%)				
ASTM A283	C	4 - 20	-	205	380 - 515	20 (200mm) 23 (50mm)			For Storage Tank of Low Temp. Use	For the width of 1524mm (5") the min. thickness is 5mm
ASTM A285	C	5 - 20	-	205	380 - 515	23 (200mm) 27 (50mm)			For Storage Tank of Low Temp. Use	
ASTM A 36	-	2 - 20	-	250	400 - 550	18 (200mm) 21 (50mm)			For General Structural Application	
A. B. S.	A	4 - 12	-	235	400 - 520	22 (5.65 VSo)			For Use In Ship Construction	
B. K. I.	A	4 - 12	-	235	400 - 520	22 (5.65 VSo)			For Use In Ship Construction	
L. R.	A	4 - 16	-	235	400 - 520	22 (5.65 VSo)			For Use In Ship Construction	
ASTM A 572	42	5 - 16	-	290	415 min	18 (200mm)	-	-	For Welded Construction With Improved Toughness	
	50	5 - 16	-	345	450 min	16 (200mm)	-	-		
	55	5 - 16	-	380	485 min	15 (200mm)	-	-		
ASTM A 516	70	5 - 16	-	260	485 - 620	17 (200mm) 21 (50mm)	-	-	For Pressure Vessel Carbon Steel For Moderate & Lower Temp. Service With Improved Notch Toughness	
DIN 17100	ST 52.3	5 - 16	≤ 16	355	510 - 608	22 (200mm)	2XT/180°	0°C (27)		
BS 4360	50 A	5 - 16	≤ 16	355	490 - 640	18 (200mm)	-	-	Superior Weldability	
	50 B	5 - 16	≤ 16	355	490 - 640	18 (200mm)	-	-		
	50 C	5 - 16	≤ 16	355	490 - 640	18 (200mm)	-	0°C (27)		
	50 D	5 - 16	≤ 16	355	490 - 640	18 (200mm)	-	-20°C (27)		
EN 10025 TH 2004	S 355 JR+AR	5 - 16	≤ 16	355	470 - 630	20 (5.65 VSo)	-	20°C (27)	as per order for S 355 JR+AR only	
	S 355 JO+AR	5 - 16	≤ 16	355	470 - 630	20 (5.65 VSo)	-	0°C (27)		
	S 355 J2+N	5 - 16	≤ 16	355	470 - 630	20 (5.65 VSo)	-	-20°C (27)		
	S 355 K2+N	5 -16	≤ 16	355	470 - 630	20 (5.65 VSo)	-	-20°C (40)		
JIS G 3106	SM 490 A	6 - 16	≤ 16	325	490 - 610	17 (200mm)	-	-		
	SM 490 B	6 - 16	≤ 16	325	490 - 610	17 (200mm)	-	0°C (27) < 12mm, no impact test		
	SM 490 C	6 - 16	≤ 16	325	490 - 610	17 (200mm)	-	0°C (47) < 12mm, no impact test		
	SM 490 YA	6 - 16	≤ 16	365	490 - 610	15 (200mm)	-	-		
	SM 490 YB	6 - 16	≤ 16	365	490 - 610	15 (200mm)	-	0°C (27) < 12mm, no impact test		
JIS G 3116	S G 295	2 - 3	2 ≥ 3	295	440	26 (50mm)	180° /1.5XT	-	For LPG Cylinder	
AS 3678	350	6 - 12	> 8 ≤ 12 > 8 ≤ 16	360 350	450 min	22 (200mm)	-	-		
	250	4 - 16	> 8 ≤ 12 > 8 ≤ 16	260 250	410 min	20 (200mm)	-	-		

Specification	Grade	Product Thickness (mm)	Thickness Range (mm)	Tensile Test			Bend Test	Impact Test Average Temp. (Joule)	Application	Remarks
				YS Min. (N/mm^2)	UTS (N/mm^2)	E Min. (%)				
BS 4360	40 A	4 - 16	≤ 16	235	340 - 500	22 (200mm)	-			For the width of 1524mm (5") the min. thickness is 5mm
	40 B	4 - 16	≤ 16	235	340 - 500	22 (200mm)	-	20°C (27) (as per order)		
	40 C	4 - 16	≤ 16	235	340 - 500	22 (200mm)	-	0°C (27)		
	40 D	4 - 16	≤ 16	235	340 - 500	22 (200mm)	-	-20°C (27)	For General Structure Purpose	
	43 A	4 - 16	≤ 16	275	430 - 580	20 (200mm)	-			
	43 B	4 - 16	≤ 16	275	430 - 580	20 (200mm)	-	20°C (27) (as per order)		
	43 C	4 - 16	≤ 16	275	430 - 580	20 (200mm)	-	0°C (27)		
	43 D	4 - 16	≤ 16	275	430 - 580	20 (200mm)	-	-20°C (27)		
DIN 17100	ST 37.2	4 - 20	≤ 16 > 16 ≤ 40 > 40	235 225 225	363 - 441	22 (200mm) 21 (200mm) 20 (200mm)	1XT/180°	20°C / 27 (as per order)	For General Structure Purpose	
EN 10025 TH 2004	S 235 JR+AR	4 - 20	≤ 16 > 16 ≤ 40	235 225	360 - 510	24 (5.65 VSo) 24 (5.65 VSo)	-	20° (27) (as per order)		
	S 235 JO+AR	4 - 20	≤ 16 > 16 ≤ 40	235 225	360 - 510	24 (5.65 VSo) 24 (5.65 VSo)	-	0°C (27)		
	S 235 J2+N	4 - 20	≤ 16 > 16 ≤ 40	235 225	360 - 510	24 (5.65 VSo) 24 (5.65 VSo)	-	-20°C (27)	For General Structure Purpose	
	S 275 JR+AR	4 - 20	≤ 16 > 16 ≤ 40	275 265	410 - 560	21 (5.65 VSo) 21 (5.65 VSo)	-	20°C / 27 (as per order)		
	S 275 JO+AR	4 - 20	≤ 16 > 16 ≤ 40	275 265	410 - 560	21 (5.65 VSo) 21 (5.65 VSo)	-	0°C (27)		
	S 275 J2+N	4 - 20	≤ 16 > 16 ≤ 40	275 265	410 - 560	21 (5.65 VSo) 21 (5.65 VSo)	-	-20°C (27)		

Specification	Grade	Product Thickness (mm)	Thickness Range (mm)	Tensile Test			Bend Test	Impact Test Average Temp. (Joule)	Application	Remarks
				YS Min. (N/mm^2)	UTS (N/mm^2)	E Min. (%)				
JIS G 3116	S G 295	2 - 3	2 ≥ 3	295	440	26 (50mm)	180° /1.5XT	-	For LPG Cylinder	-

NEW !!
Grade SG 295

for LPG Gas Cylinders application

Hot Roll Pickled Oil (HRPO)

Pickling treatment will removes most surface impurities from the steel surface with the use of chemicals, and is covered with a final layer of protective coatings. Our years of experience in handling and controlling the right amount of chemical used in this field of technology will ensure the treatment to produce a high degree of surface smoothness to the plate or coil products.

With our current technology, we are able to produce hot rolled products with the standard pickling treatment, and covered by a layer of oil based protective coating in the final process. This protective coating will assist in resisting against corrosion process during storage and transportation of the product, and can be applied either to our plate or coil products.

Standard & Specification	: ASTM A-36, ASTM A-572, JIS G 3101, JIS G 3131
Available Size	: Thickness 1.5mm - 3mm, Width 700mm - 1000mm, Maximum 25 MT/Coil
Annual Capacity	: 900.000 MT/Year

Cold Roll Coil (CRC)

At GRP we also produced our coil products in cold rolled form to cater to specific materials requirement for that unique product application.

This flat steel product rolled into thinner sizes while it is in normal room temperature to the exact thickness requirement and rolled into coils. The resulting of cold rolled coils is that they have a better surface quality, thinner profiles, and excellent finishes, and can be made into different type of products by means of cold forming.

Standard & Specification	: JIS G 3141 spec 1B, JIS G 3141 spec SB, JIS G 3141 spec SD
Available Size	: Thickness 0.2mm - 1.5mm, Width 700mm - 1000mm, Maximum 762 MT/Coil
Annual Capacity	: 900.000 MT/Year

WELDED BEAM

Functioned similar to the mass produced H and I beam, the welded beams are fabricated by welding together different plates to form a single beam of required size and shape. In order to achieve Engineering Optimization, Welded Beam serves as an alternative in construction Projects that require beams that are not available in standard hot rolled form.

Our welded beam products are SAW (Submerged Arc Welding). The process is closely supervised by our trained, qualified technicians and engineers, with hands on years of experience.The quality of the product is monitored at stages by an autonomous QA/QC Department.

At GRP, we produce Welded Beams in compliance with the JIS G 3192 standards. Our orders are tailor made as per customer's request. Customer can choose specification of Material, size of the beam and the welding/dimensional standard to be followed. Apart from Welded Beams, we also fabricate "T" Beams, King / Queen Cross, Box Beams, Box Girders and Runway Beams.

We have the unique facility to Tack Weld and Straighten Beams of Flange width up to 1,000mm and 60mm Thk, very rare to find with many other fabricators.

Standard & Specification	: Supply various specification/international standard like JIS, ASTM , EN , BS, AS, ABS , etc.
Available Sizes	: As per Customer Requirement.
Annual Production Capacity	: 36,000 to 50,000 MT/Year.

According JIS G 3192

Standard Sectional Dimension				Section Area A	Unit Weight	Unit Weight	Informative Reference					
							Geometrical Moment of Inertia		Radius of Gyration of Area		Modulus of Section	
H x B	t1	t2	r				Ix	Iy	ix	iy	Zx	Zy
mm	mm	mm	mm	mm^2	kg/m	kg/12m	cm^4	cm^4	cm	cm	cm^3	cm^3
588 x 300	12	20	28	192.5	151.00	1812	118,000	9,020	24.80	6.85	4,020.00	601.00
700 x 300	13	24	28	235.5	181.00	2171	201,000	10,800	29.30	6.78	5,760.00	722.00
800 x 300	14	26	28	267.4	207.00	2474	292,000	11,700	33.00	6.62	7,290.00	782.00
900 x 300	16	28	28	309.8	240.00	2878	411,000	12,600	36.00	6.39	9,140.00	843.00
350 x 350	12	19	20	173.9	137	1644	40,300	13,600	15.2	8.84	2,300.00	776.00
400 x 400	13	21	22	218.7	172	-	66,600	22,400	17.5	10.1	3,330.00	1,120.00

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Tubular Products




ERW Pipe

With many different application and uses that can be achieved from using round pipe products, at GRP we manufactured our pipe from 1/4" to 6" OD in a of length 3500 mm to 1200 mm Electric Resistance Welding (ERW) methods.

As we strive to maintain to the highest standard quality, our ERW tubular pipe complied with different local and international standard specifications for its varying application requirements.

The surface finish for this product is available in bare or in coated form and the processing will be carried out in our facility. For the application carrying flow of water/ liquid material, we can also perform hydrostatic testing on the products to ensure leakage-proof in its operations.

Standard & Specification	: ASTM A 53 (A), BS 1387:1985 Heavy Series (H), Medium Series(M), Light series (L), BS EN 10255:2004 (E), JIS G 3444 STK 290, JIS G 3444 STK 400, JIS G 3445 STKM 11 A , STKM 12 A, JIS G 3452 SGP Black And Galvanized Pipe, JIS G 3454 STPG 370, SNI 07 - 0068 - 2007 PKB 30, SNI 07 - 0068 2007 PKB 41.
Available Size	: 1/4 inch OD to 6 inch OD (Outside Diameter)
Annual Capacity	: 72.000 MT/Year

ASTM A 53 (A)

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Sch	Test Pressure	
DN	NPS				Psi	Kg/cm²
20	3/4"	26.7	2.87	40	700	49
25	1"	33.4	3.38	40	700	49
32	1 1/4"	42.2	3.56	40	1200	85
40	1 1/2"	48.3	3.68	40	1200	85
50	2"	60.3	3.91	40	2300	161
65	2 1/2"	73	5.16	40	2500	175
80	3"	88.9	3.18	-	1290	91
			3.96	-	1600	112
			4.78	-	1930	136
			5.49	40	2220	156
100	4"	114.3	3.18	-	1000	70
			3.96	-	1250	88
			4.78	-	1500	105
			5.56	-	1750	123
			6.02	40	1900	134

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Carbon (C) : 0.25 % max
- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.045 % max

Mechanical

- Tensile Strength : 330 N/mm² min
- Yield Strength : 205 N/mm² min
- Elongation : 22 % min

Tolerance

- Thickness : ± 12.5 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 48.3 mm : ± 0.4 mm
  - OD ≥ 60.3 mm : ± 1 %
  - Standar length of Pipe : 6000 mm

BS 1387:1985

Heavy (H)

Nominal Size		Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R	Max (mm)	Min (mm)		Psi	BAR
50	2	60.8	59.8	4.5	730	50
65	2 1/2	76.6	75.4	4.5	730	50
80	3	89.5	88.1	5.0	730	50
100	4	114.9	113.3	5.4	730	50
125	5	140.6	138.7	5.4	730	50
150	6	166.1	164.1	5.4	730	50

Medium (M)

Nominal Size		Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R	Max (mm)	Min (mm)		Psi	BAR
20	3/4	27.2	26.6	2.6	730	50
25	1	34.2	33.4	3.2	730	50
32	1 1/4	42.9	42.1	3.2	730	50
40	1 1/2	48.8	48	3.2	730	50
50	2	60.8	59.8	3.6	730	50
65	2 1/2	76.6	75.4	3.6	730	50
80	3	89.5	88.1	4.0	730	50
100	4	114.9	113.3	4.5	730	50
125	5	140.6	138.7	5.0	730	50
150	6	166.1	164.1	5.0	730	50

Light (L)

Nominal Size		Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R	Max (mm)	Min (mm)		Psi	BAR
20	3/4	27.2	26.6	2.3	730	50
25	1	34.2	33.4	2.9	730	50
32	1 1/4	42.9	42.1	2.9	730	50
40	1 1/2	48.8	48	2.9	730	50
50	2	60.8	59.8	3.2	730	50
65	2 1/2	76.6	75.4	3.2	730	50
80	3	89.5	88.1	3.2	730	50
100	4	114.9	113.3	3.6	730	50

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Carbon (C) : 0.20 % max
- Phosphor (P) : 0.045 % max
- Sulphur (S) : 0.045 % max

Mechanical Properties

- Tensile Strength : 320 - 460 N/mm²
- Yield Strength : 195 N/mm² min
- Elongation : 20 %

Tolerance

- Thickness : + Not Specified
  : - 8 % Light Tubes
  - 10 % Medium and Heavy
- Length : ± 2 %
- Standard length of pipe : 6000 mm

BS EN 10255:2004 (E)

Type L

Nominal Size		Specified Outside Diameter (mm)	Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R		Max (mm)	Min (mm)		Psi	BAR
20	3/4	26.9	27.3	26.5	2.3	730	50
25	1	33.7	34.2	33.3	2.9	730	50
32	1 1/4	42.4	42.9	42	2.9	730	50
40	1 1/2	48.3	48.8	47.9	2.9	730	50
50	2	60.3	60.8	59.7	3.2	730	50
65	2 1/2	76.1	76.6	75.3	3.2	730	50
80	3	88.9	89.5	88	3.2	730	50
100	4	114.3	115	113.1	3.6	730	50
125	5	139.7	140.8	138.5	4.5	730	50
150	6	165.1	166.5	163.9	4.5	730	50

Type L1

Nominal Size		Specified Outside Diameter (mm)	Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R		Max (mm)	Min (mm)		Psi	BAR
20	3/4	26.9	27.3	26.5	2.3	730	50
25	1	33.7	34.2	33.3	2.9	730	50
32	1 1/4	42.4	42.9	42	2.9	730	50
40	1 1/2	48.3	48.8	47.9	2.9	730	50
50	2	60.3	60.8	59.7	3.2	730	50
65	2 1/2	76.1	76.6	75.3	3.2	730	50
80	3	88.9	89.5	88	3.6	730	50
100	4	114.3	115	113.1	4.0	730	50

Type L2

Nominal Size		Specified Outside Diameter (mm)	Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R		Max (mm)	Min (mm)		Psi	BAR
20	3/4	26.9	27.3	26.5	2.3	730	50
25	1	33.7	34.2	33.3	2.6	730	50
32	1 1/4	42.4	42.9	42	2.6	730	50
40	1 1/2	48.3	48.8	47.9	2.9	730	50
50	2	60.3	60.8	59.7	2.9	S	50
65	2 1/2	76.1	76.6	75.3	3.2	730	50
80	3	88.9	89.5	88	3.2	730	50
100	4	114.3	115	113.1	3.6	730	50

Heavy Series (H)

Nominal Size		Specified Outside Diameter (mm)	Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R		Max (mm)	Min (mm)		Psi	BAR
50	2	60.3	60.8	59.7	4.5	730	50
65	2 1/2	76.1	76.6	75.3	4.5	730	50
80	3	88.9	89.5	88	5.0	730	50
100	4	114.3	115	113.1	5.4	730	50
125	5	139.7	140.8	138.5	5.4	730	50
150	6	165.1	166.5	163.9	5.4	730	50

Medium Series (M)

Nominal Size		Specified Outside Diameter (mm)	Outside Diameter		Wall Thickness T (mm)	Hydrostatic Test	
DN (mm)	Thread Size R		Max (mm)	Min (mm)		Psi	BAR
20	3/4	26.9	27.3	26.5	2.6	730	50
25	1	33.7	34.2	33.3	3.2	730	50
32	1 1/4	42.4	42.9	42	3.2	730	50
40	1 1/2	48.3	48.8	47.9	3.2	730	50
50	2	60.3	60.8	59.7	3.6	730	50
65	2 1/2	76.1	76.6	75.3	3.6	730	50
80	3	88.9	89.5	88	4.0	730	50
100	4	114.3	115	113.1	4.5	730	50
125	5	139.7	140.8	138.5	5.0	730	50
150	6	165.1	166.5	163.9	5.0	730	50

Chemical Composition

- Carbon (C) : 0.20 % max
- Phosphor (P) : 0.035 % max
- Sulphur (S) : 0.03 % max

Mechanical Properties

- Tensile Strength : 320 - 520 N/mm²
- Yield Strength : 195 N/mm² min
- Elongation : 20 %

Tolerance

- Thickness : ± 10 % Medium (M) & Heavy Series (H,L)
  : + Not Specified
  : - 8 % Type (L1, L2)
- Length : ± 2 %
- Standard length of pipe : 6000 mm

JIS G 3444 STK 290

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Cross Sectional Area cm²
A	B			
15	1/2"	21.7	2.0	1.238
20	3/4"	27.2	2.0	1.583
			2.3	1.799
25	1"	34	2.3	2.291
32	1 1/4"	42.7	2.3	2.919
			2.5	3.157
			2.3	3.345
40	1 1/2"	48.6	2.5	3.621
			2.8	4.029
			3.2	4.564
			2.3	4.205
50	2"	60.5	3.2	5.760
			4.0	7.100
			2.8	6.495
65	2 1/2"	76.3	3.2	7.349
			4.0	9.085
80	3"	89.1	2.8	7.591
			3.2	8.636
			3.2	11.17
100	4"	114.3	3.5	12.18
			4.5	15.52
			3.6	15.4
125	5"	139.8	4.0	17.07
			4.5	19.13
			6.0	25.22
			4.5	22.72
150	6"	165.2	5.0	25.16
			6.0	30.01
			7.1	35.26

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

- Tensile Strength : 294 N/mm² min
- Yield Strength : -
- Elongation : 21 % min

Tolerance

- Thickness
  - Under 4 mm : + 0.6 mm
    - 0.5 mm
  - 4 mm or over, excl. 12 mm : + 15 %
    - 12.5 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %
  - Standard length of pipe : 6000 mm

JIS G 3444 STK 400

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Cross Sectional Area cm²
A	B			
40	1 1/2"	48.6	2.8	4.029
			3.2	4.564
50	2"	60.5	3.2	5.760
65	2 1/2"	76.3	2.8	6.495
			3.2	7.349
80	3"	89.1	2.8	7.591
			3.2	8.636
100	4"	114.3	3.2	11.17
			3.5	12.18
125	5"	139.8	3.6	15.4
			4.0	17.07
			4.5	19.13
			6.0	25.22
150	6"	165.2	4.5	22.72
			5.0	25.16
			6.0	30.01
			7.1	35.26

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Carbon (C) : 0.25 % max
- Phosphor (P) : 0.04 % max
- Sulphur (S) : 0.04 % max

Mechanical Properties

- Tensile Strength : 400 N/mm² min
- Yield Strength : 235 N/mm² min
- Elongation : 14 % min

Tolerance

- Thickness
  - Under 4 mm : + 0.6 mm
    - 0.5 mm
  - 4 mm or over, excl. 12 mm : + 15 %
    - 12.5 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %
  - Standard length of pipe : 6000 mm

SNI 07 - 0068 - 2007 PKB 30

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Cross Sectional Area cm²
A	B			
15	1/2"	21.7	2.0	1.238
20	3/4"	27.2	2.0	1.583
			2.3	1.799
25	1"	34	2.3	2.291
32	1 1/4"	42.7	2.3	2.919
			2.8	3.157
40	1 1/2"	48.6	2.3	3.345
			2.8	4.029
			3.2	4.564
50	2"	60.5	2.3	4.205
			3.2	5.760
			4.0	7.100
65	2 1/2"	76.3	2.8	6.465
			3.2	7.439
			4.0	9.085
80	3"	89.1	2.8	7.591
			3.2	8.936
			4.0	10.690
100	4"	114.3	3.2	11.170
			3.6	12.520
			4.5	15.520
			5.6	19.120
125	5"	139.8	3.6	15.400
			4.0	17.070
			4.5	19.130
			6.0	25.220
150	6"	165.2	4.5	22.720
			5.0	25.160
			6.0	30.010
			7.0	34.790

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

- Tensile Strength : 294 N/mm² min
- Yield Strength : -
- Elongation : 21 % min

Tolerance

- Thickness
  - < 4 mm : ± 0.6 mm
  - : - 0.5 mm
  - 4 mm s/d 12 mm : + 15 %
  - : - 12.5 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %
  - Standard length of pipe : 6000 mm

SNI 07 - 0068 - 2007 PKB 41

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Cross Sectional Area cm²
A	B			
32	1 1/4"	42.7	2.8	3.510
40	1 1/2"	48.6	2.8	4.029
			3.2	4.564
50	2"	60.5	2.3	4.205
			3.2	5.760
65	2 1/2"	76.3	2.8	6.465
			3.2	7.349
80	3"	89.1	2.8	7.591
			3.2	8.936
100	4"	114.3	3.2	11.170
			3.6	12.520
125	5"	139.8	3.6	15.400
			4.0	17.070
			4.5	19.130
			6.0	23.600
150	6"	165.2	4.5	22.720
			5.0	25.160
			6.0	30.010
			7.0	34.790

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Carbon (C) : 0.25 % max
- Phosphor (P) : 0.04 % max
- Sulphur (S) : 0.04 % max

Mechanical Properties

- Tensile Strength : 402 N/mm² min
- Yield Strength : 235 N/mm² min
- Elongation : 14 % min

Tolerance

- Thickness
  - < 4 mm : + 0.6 mm
  - : - 0.5 mm
  - 4 mm s/d 12 mm : + 15 %
  - : - 12.5 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %
  - Standard length of pipe : 6000 mm

SNI - 07 - 0039 - 1987 (Medium)

Galvanized Pipe

Nominal Size		Outside Diameter (mm)		Thickness (mm)	Test Pressure	
A	B	Max	Min		Psi	Kgf/cm²
20	3/4"	27.2	26.4	2.65	710	50
25	1"	34.2	33.4	3.25	710	50
32	1 1/4"	42.9	42.1	3.25	710	50
40	1 1/2"	48.80	48.0	3.25	710	50
50	2"	60.8	59.8	3.65	710	50
65	2 1/2"	76.6	75.4	3.65	710	50
80	3"	89.5	88.1	4.05	710	50
100	4"	114.9	113.3	4.5	710	50
125	5"	140.6	138.7	4.85	710	50
250	6"	166.1	164.1	4.85	710	50

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

- Tensile Strength : 33 Kgf/mm² min
- Elongation : 20 % min

Tolerance

- Thickness
  - < 4 mm : + 0.6 mm
  - : - 0.5 mm
  - 4 mm s/d 12 mm : + 15 %
  - : - 12.5 %
- Length : ± 2 %
- Weight with zinc : 300 gr/m²

Standard length of pipe : 6000 mm

JIS G3452 SGP

Black and Galvanized Pipe

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Test Pressure	
A	B			Psi	Kgf/cm²
20	3/4"	27.2	2.8	365	25
25	1"	34	3.2	365	25
32	1 1/4"	42.7	3.5	365	25
40	1 1/2"	48.6	3.5	365	25
50	2"	60.5	3.8	365	25
65	2 1/2"	76.3	4.2	365	25
80	3"	89.1	4.2	365	25
100	4"	114.3	4.5	365	25
125	5"	139.8	4.5	365	25
150	6"	165.2	5.0	365	25

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.04 % max
- Sulphur (S) : 0.04 % max

Mechanical Properties

- Tensile Strength : 294 N/mm² min
- Elongation : 24 % min

Tolerance

- Thickness
  - < 4 mm : + 0.6 mm
  - : - 0.5 mm
  - 4 mm s/d 12 mm : + 15 %
  - : - 12.5 %
- Length : ± 2 %
- Weight with zinc : 400 gr/m²
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %

Standard length of pipe : 6000 mm

JIS G 3454 STPG 370

Nominal Size		Outside Diameter (mm)	Thickness (mm)	Sch	Test Pressure	
DN	NPS				Bar	Kgf/cm²
20	3/4"	27.2	2.90	40	59	60
25	1"	34	3.40	40	59	60
32	1 1/4"	42.7	3.60	40	59	60
40	1 1/2"	48.6	3.70	40	59	60
50	2"	60.5	3.20	20	34	35
			3.90	40	59	60
65	2 1/2"	76.3	4.50	20	34	35
			5.20	40	59	60
80	3"	89.1	4.50	20	34	35
			5.50	40	59	60
100	4"	114.3	4.90	20	34	35
			6.00	40	59	60
125	5"	139.8	5.10	20	34	35
			6.60	40	59	60
150	6"	165.2	5.50	20	34	35
			7.10	40	59	60

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Carbon (C) : 0.25 % max
- Phosphor (P) : 0.04 % max
- Sulphur (S) : 0.04 % max

Mechanical Properties

- Tensile Strength : 370 N/mm² min
- Yield Strength : 215 N/mm² min
- Elongation : 21 % min

Tolerance

- Thickness : ± 10mm
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 34 mm : ± 0.5 mm
  - OD ≥ 42.7 mm : ± 1 %
  - Standard length of pipe : 6000 mm

Electrical Resistance Welded Furniture Pipe

Size (Inch)	OD (Outside Diameter)	Thickness
5/8"	15.8	1.0 ~ 2.0
3/4"	19.1	1.0 ~ 2.0
7/8"	22.2	1.0 ~ 2.0
1"	25.4	1.0 ~ 2.5
1 1/4"	31.8	1.0 ~ 3.0
1 1/2"	38.1	1.0 ~ 3.0
2"	50.8	2.0 ~ 3.0

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

- Tensile Strength : 294 N/mm² min
- Elongation : 21 % min

Tolerance

- Thickness : ± 10 %
- Length : ± 2 %
- Outside Diameter
  - OD ≤ 50 mm : ± 0.5 mm
  - OD ≥ 50 mm : ± 1 %

JIS G 3445

Carbon Steel Tube For Machine Structural Purposes

Grade		Designation	Chemical Composition %					Mechanical Properties						
								Tensile Test				Flatning Test (D: Outside Diameter)	Bending Test	
			C Max	Si Max	Mn Max	P Max	S Max	Ts Min	Ys Min	El Min (%)			Bending Angle	Inside Radius
								N/mm²	N/mm²	Test no 12	Test no 5			
Grade 11	A	STKM 11 A	0.12	0.35	0.6	0.04	0.04	290	-	35	30	½ D	180°	4 D
Grade 12	A	STKM 12 A	0.2	0.35	0.6	0.04	0.04	340	175	35	30	½ D	90°	6 D
Grade 12	B	STKM 12 B	0.2	0.35	0.6	0.04	0.04	390	275	25	20	½ D	90°	6 D

Standard Tolerances				
Division	Tolerances on Outside Diameter		Division	Tolerances on Wall Thickness
No. 1	Under 50 mm	± 0.5 mm		Under 4 mm
	50 mm or over	± 1 %		
No. 2	Under 50 mm	± 0.25 mm	No. 1	4 mm or over
	50 mm or over	± 0.5 %		
	Under 25 mm	± 0.12 mm		
	25 mm or over to and excl. 40 mm	± 0.15 mm		
	40 mm or over to and excl. 50 mm	± 0.18 mm	No. 2	Under 3 mm
	50 mm or over to and excl. 60 mm	± 0.2 mm		3 mm or over
No. 3	60 mm or over to and excl. 70 mm	± 0.23 mm		
	70 mm or over to and excl. 80 mm	± 0.25 mm		
	80 mm or over to and excl. 90 mm	± 0.3 mm	No. 3	Under 2 mm
	90 mm or over to and excl. 100 mm	± 0.4 mm		2 mm or over
	100 mm or over	± 0.5 mm		
	Tolerances length			± 2 % (Length mm x 2%)

Division	Tolerances on Wall Thickness
	+ 0.6 mm
	- 0.5 mm
No. 1	+ 15 %
	- 12.5 %
No. 2	± 0.3 mm
	± 10 %
No. 3	± 0.15 mm
	± 8 %

SPIRAL PIPE

The versatile spiral-welded steel pipes are popular among different applications in the oil & gas industries, building construction, and water/liquid distribution system. This type of pipe product is often used for foundation piling, liquid flow distribution system, and ports/ jetty construction.

At GRP, we produced our pipe with the automatic double-side Submerged Arc Welding (S.A.W.) technology to ensure the great consistency of our welding and the quality of our final product.

For a specific work project, we are able produce the spiral-welded steel pipes to suit different thickness and the diameter of up to 64" OD. In addition, we are able to provide additional coating services with different type of material to the pipe depending on the project's requirement.

Available Size : Ø 6.5" - Ø 120" (Outside Diameter)
Annual Capacity : 48.000 MT/Year

Standard & Specification

Standard	Main Application	Grade	
API 5L	High strength oil & gas pipelines, slurry lines, refinery piping, etc. notes: EW : electric welded CW : continuous welded NE : non expanded CE : cold expanded	A 25 Cl I	EW/CW
		A25 Cl II	EW/CW
		A	NE/CE
		B	NE/CE
		X 42	NE/CE
		X 46	NE
			CE
		X 52	NE
			CE
		X 56	NE/CE
		X 60	NE/CE
		X 65	NE/CE
		X 70	NE/CE
		X 80	NE/CE

Standard	Main Application	Grade	
ASTM A 252	Piping	1	
		2	
		3	
AWWA C 200	Water & savage systems. Optionally pipes maybe supplied according to ASTM A 53, A 135	ASTM A 36	
		ASTM A 283	C
			D
		ASTM A 570	30
			33
			36
			40
			45
			50
		ASTM A 572	42
			50
			60

Standard	Main Application	Grade	
DIN 1626	General Application	USt 37 - 1	
		RSt 37 - 1	
		USt 37 - 2	
		RSt 37 - 2	
		St 37 - 3	
		USt 42 - 1	
		RSt 42 - 1	
		USt 42 - 2	
		RSt 42 - 2	
		St 52 - 3	
BS 3601	General Application	320	....
		360	....
		430	....

Outside Diameter		Thickness																
Inch	mm	4	6	8	9	10	11	12	12.7	13	14	15	16	17	18	19	20	21
7	177.8	17.14	25.42	33.50	37.46	41.38	45.25	49.06	51.71	52.83	56.55	60.22	63.84	67.41	70.93	74.40	77.83	81.20
8	203.2	19.65	29.18	38.51	43.10	47.64	52.14	56.58	59.66	60.97	65.32	69.62	73.86	78.06	82.21	86.31	90.35	94.35
10	254.0	24.66	36.69	48.53	54.38	60.17	65.92	71.61	75.57	77.26	82.86	88.41	93.91	99.36	104.76	110.11	115.41	120.66
12	304.8	29.67	44.21	58.55	65.65	72.70	79.70	86.65	91.48	93.55	100.40	107.20	113.95	120.65	127.30	133.91	140.46	146.97
14	355.6	34.68	51.73	68.57	76.92	85.22	93.48	101.68	107.39	109.83	117.93	125.99	133.99	141.95	149.85	157.71	165.52	173.28
16	406.4	39.69	59.24	78.60	88.20	97.75	107.26	116.71	123.30	126.12	135.47	144.78	154.04	163.24	172.40	181.51	190.57	199.58
18	457.2	44.70	66.76	88.62	99.47	110.28	121.04	131.74	139.21	142.40	153.01	163.57	174.08	184.54	194.95	205.31	215.63	225.89
20	508	49.71	74.28	98.64	110.75	122.81	134.82	146.78	155.12	158.69	170.55	182.36	194.12	205.84	217.50	229.12	240.68	252.20
22	558.8	54.73	81.79	108.66	122.02	135.33	148.60	161.81	171.03	174.97	188.09	201.15	214.17	227.13	240.05	252.92	265.74	278.51
24	609.6	59.74	89.31	118.68	133.30	147.86	162.38	176.84	186.94	191.26	205.62	219.94	234.21	248.43	262.60	276.72	290.79	304.81
26	660.4	64.75	96.83	128.71	144.57	160.39	176.16	191.87	202.85	207.54	223.16	238.73	254.25	269.73	285.15	300.52	315.85	331.12
28	711.2	69.76	104.34	138.73	155.85	172.92	189.94	206.91	218.76	223.83	240.70	257.52	274.30	291.02	307.70	324.32	340.90	357.43
30	762	74.77	111.86	148.75	167.12	185.44	203.72	221.94	234.67	240.11	258.24	276.32	294.34	312.32	330.25	348.13	365.95	383.73
32	812.8	79.78	119.37	158.77	178.40	197.97	217.50	236.97	250.58	256.40	275.78	295.11	314.39	333.62	352.80	371.93	391.01	410.04
34	863.6	84.79	126.89	168.79	189.67	210.50	231.28	252.01	266.49	272.69	293.32	313.90	334.43	354.91	375.34	395.73	416.06	436.35
36	914.4	89.80	134.41	178.81	200.94	223.03	245.06	267.04	282.40	288.97	310.85	332.69	354.47	376.21	397.89	419.53	441.12	462.66
38	965.2	94.81	141.92	188.84	212.22	235.55	258.84	282.07	298.31	305.26	328.39	351.48	374.52	397.50	420.44	443.33	466.17	488.96
40	1016	99.82	149.44	198.86	223.49	248.08	272.62	297.10	314.22	321.54	345.93	370.27	394.56	418.80	442.99	467.13	491.23	515.27
42	1066.8	104.83	156.96	208.88	234.77	260.61	286.40	312.14	330.13	337.83	363.47	389.06	414.60	440.10	465.54	490.94	516.28	541.58
44	1117.6	109.85	164.47	218.90	246.04	273.13	300.18	327.17	346.03	354.11	381.01	407.85	434.65	461.39	488.09	514.74	541.34	567.89
46	1168.4	114.86	171.99	228.92	257.32	285.66	313.96	342.20	361.94	370.40	398.55	426.64	454.69	482.69	510.64	538.54	566.39	594.19
48	1219.2	119.87	179.51	238.95	268.59	298.19	327.74	357.23	377.85	386.68	416.08	445.43	474.73	503.99	533.19	562.34	591.45	620.50
50	1270	124.88	187.02	248.97	279.87	310.72	341.52	372.27	393.76	402.97	433.62	464.22	494.78	525.28	555.74	586.14	616.50	646.81
52	1320.8	129.89	194.54	258.99	291.14	323.24	355.30	387.30	409.67	419.25	451.16	483.02	514.82	546.58	578.29	609.95	641.55	673.11
54	1371.6	134.90	202.05	269.01	302.42	335.77	369.08	402.33	425.58	435.54	468.70	501.81	534.87	567.88	600.84	633.75	666.61	699.42
56	1422.4	139.91	209.57	279.03	313.69	348.30	382.86	417.37	441.49	451.83	486.24	520.60	554.91	589.17	623.39	657.55	691.66	725.73
58	1473.2	144.92	217.09	289.05	324.96	360.83	396.64	432.40	457.40	468.11	503.77	539.39	574.95	610.47	645.93	681.35	716.72	752.04
60	1524	149.93	224.60	299.08	336.24	373.35	410.42	447.43	473.31	484.40	521.31	558.18	595.00	631.76	668.48	705.15	741.77	778.34
62	1574.8	154.94	232.12	309.10	347.51	385.88	424.20	462.46	489.22	500.68	538.85	576.97	615.04	653.06	691.03	728.95	766.83	804.65
64	1625.6	159.95	239.64	319.12	358.79	398.41	437.98	477.50	505.13	516.97	556.39	595.76	635.08	674.36	713.58	752.76	791.88	830.96

Weight/M (Kg/M) = (OD-T) x T x 0.2466

Not Available

NOTE : Non standard sizes are available upon request and subject to minimum quantity.

OD = Outside Diameter (mm)
T = Thickness (mm)

Rectangular Pipe & Square Pipe

Rectangular Pipe

Square Pipe

Rectangular Pipe

Shaped to rectangular form, we produced this pipe using Electric Resistance Welding autonomous machine. Using this machine we are able to make a consistent welding all along the pipe ensuring the quality of usage for our product.

This hollow pipe are very popular in the industrial production, as it is turned into mass produced products such as supermarket racks, container fabrication, auto fabrication, motor cycles, furniture. It is also used in industrial applications such as scaffolding, water systems, gas pipelines, liquid pipelines, equipment for oil refineries, and structural steel.

Square Pipe

Our square formed pipes also made by welding using Electric Resistance Welding methods, and are also machine weld to ensure welding quality consistency.

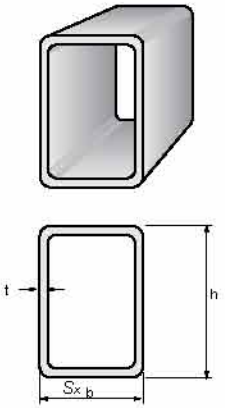
The square pipe is used in structural projects, shelves, benches, trailers, ornamental purposes and other general purpose use. It is widely popular in structural project as this form of pipe is more efficient in comparison with round steel pipes, as it is easily welded than the angular round pipe.

Standard Dimentional Tolerances	: JIS G 3466
SNI 07 - 0068 - 2007	: PKP 30
Standard Material	: JIS G 3131 SPHC, SAE 1006/SAE 1008
Available Size	: 15mm X 30mm s/d 50mm X 100mm
Annual Capacity	: 36.000 MT/Year

Standard Dimensional Tolerance JIS G 3466

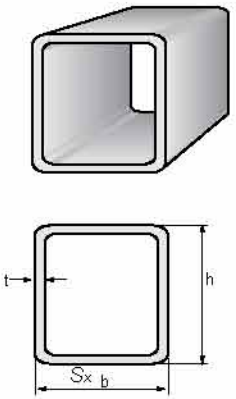
Rectangular Tube Pipe

Size (mm)	Thickness (mm)
40 x 20	1.0 ~ 3.0
50 x 30	1.8 ~ 3.2
60 x 40	2.0 ~ 3.5
75 x 45	2.0 ~ 3.5
80 x 40	2.0 ~ 3.8
100 x 50	2.0 ~ 4.0



Square Tube Pipe

Size (mm)	Thickness (mm)
20 x 20	1.0 ~ 2.0
25 x 25	1.0 ~ 2.0
30 x 30	1.0 ~ 3.2
40 x 40	1.8 ~ 3.5
50 x 50	2.0 ~ 3.8
60 x 60	2.0 ~ 4.0
75 x 75	2.0 ~ 4.0
100 x 100	2.8 ~ 4.5



NOTE : Non standard sizes are available upon requesst and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

- Tensile Strength : 294 N/mm² min
- Elongation : 21% min

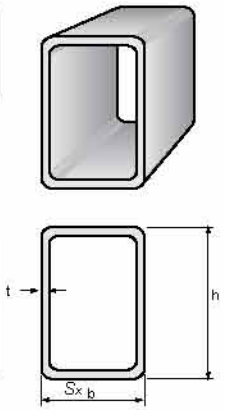
Tolerance

- Thickness < 3 mm : ± 0.3 mm
  3 mm s/d 12 mm : ± 10 %
- Length : ± 2 %
- Side Length < 100 mm : ± 1.5 mm
  ≥ 100 mm : ± 10 %
- Corner betwen two side : ± 1.5°
- Standard length of pipe : 6000 mm

SNI 07 - 0068 - 2007 PKP 30

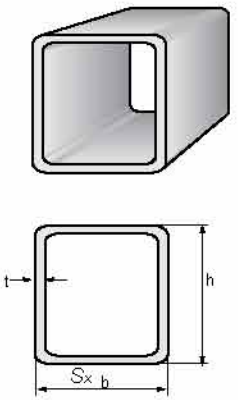
Rectangular Tube Pipe

Size (mm)	Thickness (mm)
75 x 45	2.30
	3.20
100 x 50	2.30
	3.20



Square Tube Pipe

Size (mm)	Thickness (mm)
40 x 40	1.85
50 x 50	2.30
	2.75
	3.20
60 x 40	2.30
	3.20
75 x 75	2.30
	3.20
100 x 100	3.20
	4.00
	4.50



NOTE : Non standard sizes are available upon request and subject to minimum quantity.

Chemical Composition

- Phosphor (P) : 0.05 % max
- Sulphur (S) : 0.05 % max

Mechanical Properties

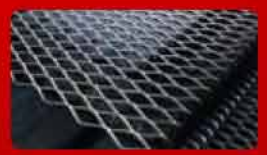
- Tensile Strength : 294 N/mm² min
- Elongation : 21% min

Tolerance

- Thickness < 3 mm : ± 0.3 mm
  3 mm s/d 12 mm : ± 10 %
- Length : ± 2 %
- Side Length < 100 mm : ± 1.5 mm
  ≥ 100 mm : ± 10 %
- Corner betwen two side : ± 1.5°
- Standard length of pipe : 6000 mm

Forming Product



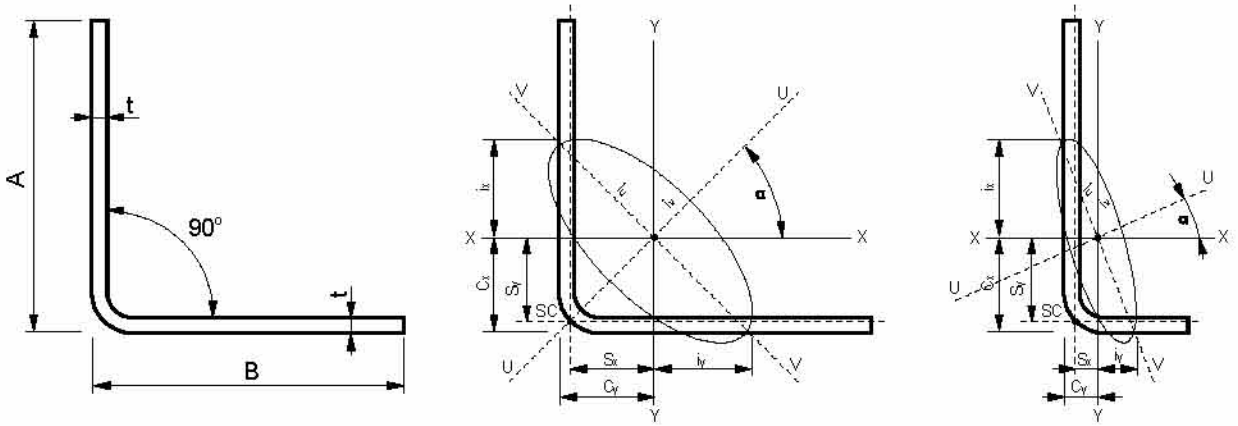
Angle (Cold Formed)

The angled bar produced here in GRP is made through forming process known as cold formed, as its shaped is made by bending the plate from continuous steel ribbon that have been slithered from flat steel rolls.

Our angled bar has been mainly used in the construction of light steel structure, which includes:

- Frame system of factory building
- Thin walled steel truss
- Grid & reticulated shell structure
- Roof trusses
- Purlins & Girts
- Floor framing
- Bench frames
- Gates & Fences
- Scaffolds
- Ladders, hand rails, shelving frames

Standard Dimentional Tolerances	: JIS G 3350.
Standard Material	: JIS 3131 SPHC, SAE 1006/1008
Available Size	: 50 x 50 x 5
Standard Length	: 6M



Designation	Dimension mm		Center of Grafity cm		Secondary moment of Area cm⁴				Radius of Gyration of Area cm				tan α	Modulus of Section cm³		Center of Shear cm³	
	A x B	t	Cx	Cy	Ix	Iy	Iu	Iv	ix	iy	iu	iv		Zx	Zy	Sx	Sy
3155	60 x 60	3.2	1.65	1.65	13.1	13.1	21.3	5.03	1.89	1.89	2.41	1.17	1.00	3.02	3.02	1.49	1.49
3115	50 x 50	3.2	1.40	1.40	7.47	7.47	12.1	2.83	1.57	1.57	2.00	0.97	1.00	2.07	2.07	1.24	1.24
3113	50 x 50	2.3	1.36	1.36	5.54	5.54	8.94	2.13	1.58	1.58	2.01	0.98	1.00	1.52	1.52	1.24	1.24
3075	40 x 40	3.2	1.15	1.15	3.72	3.72	6.04	1.39	1.25	1.25	1.59	0.76	1.00	1.30	1.30	0.99	0.99
3035	30 x 30	3.2	0.90	0.90	1.50	1.50	2.45	0.54	0.92	0.92	1.18	0.56	1.00	0.71	0.71	0.74	0.74
3725	75 x 30	3.2	2.86	2.57	18.9	1.94	19.6	1.47	2.43	0.78	2.48	0.62	0.198	4.07	4.80	0.41	2.70

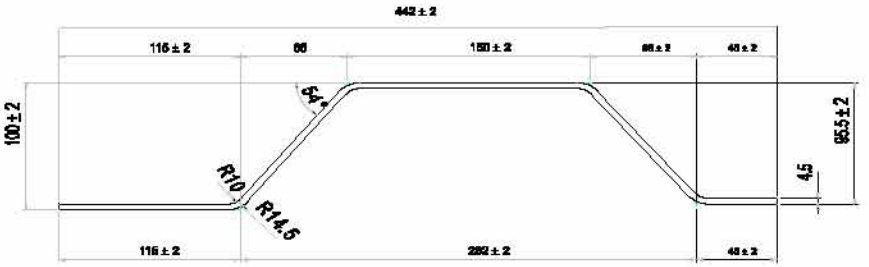
Bridge Deck

Steel Bridge Decking is used in new bridge construction or to rehabilitate existing structures. Steel decked bridges can be built in any weather conditions. AIL roll forms bridge decking is produced at a 25.4 mm (4 ¼") depth using Grade 50 steel in either pre-galvanized or bare steel. If the latter is used, it can be prime painted.

Advantages :

* Available pre-galvanized or bare steel
* Can be built in any weather conditions
* Affordable strengthening solution for existing bridges
* Nests for economical shipping

Standard & Specification : ASTM A 572, JIS G 3101, JIS 3131, JIS G 3352
Available Size : 4mm x 100mm x 442mm to 6mm x 100mm x 442mm



Bridge Deck

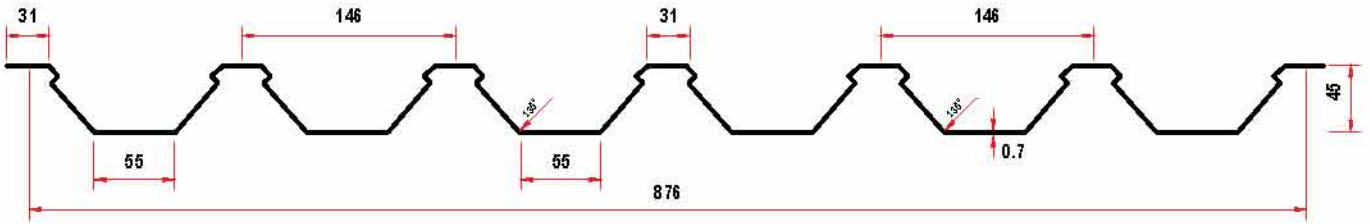
Length	Size	Standard
7000	4.0 x 100 x 442	ASTM A 572, JIS G 3101, JIS 3131, JIS G 3352
	4.5 x 100 x 442	
	6.0 x 100 x 442	
9000	4.0 x 100 x 442	
	4.5 x 100 x 442	
	6.0 x 100 x 442	

FLOOR DECK

The other deck products we produced is the Composite Steel Floor Deck has a ribbed profile with embossments designed to interlock with concrete slabs. This interlocking system creates creating a reinforced concrete slab that serves the dual purpose of permanent form and positive reinforcement.

Installation is fast, easy, and economical and it eliminates the need for temporary wood forming.

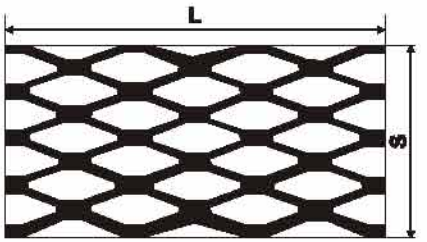
Standard & Specification : ASTM A 924
Available Size : 0.7mm x 45mm x 876mm

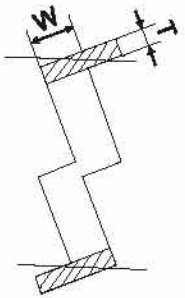


Expanded Mesh

Another product in our range is the Expanded Mesh. Expanded mesh is one continuous single sheet of mesh produced from a flat metal plate where it is sheared and stretched but is left intact at the 'knuckles'. It is available in a variety of thicknesses with differing sizes and designs of the apertures. Additional feature is the provision of an excellent anti-slip surface. This makes the product suitable for ramps (e.g. inclined walkways adjacent to conveyors) platforms and stair treads. The open nature of the product provides good visibility through the mesh as well as the easy passage of air and sound whilst ensuring security and protection.

Standard & Specification	: JIS G3351, JIS G 3131 & ASTM 830
Available Size	: 22mm x 57mm to 75mm x 200mm
Annual Capacity	: 1.440 MT/Year





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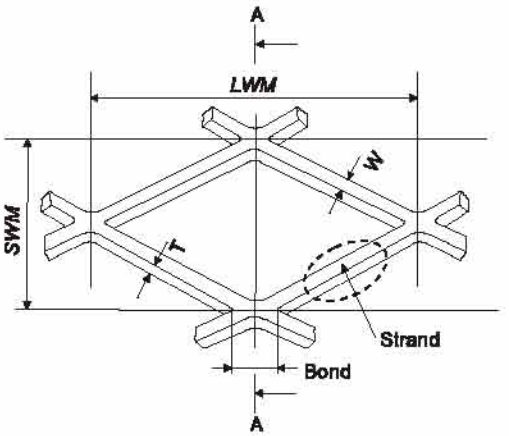


JIS G 3131 / ASTM A 830

Type		Dimension		Mesh Size		Product Size	
		SWM	LWM	T	Width	LP	(S)
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
Expanded Ornamesh	EOM 3035	22	57	3.0	3.5	1200	2400
	EOM 3045	35	76	3.0	4.5	1200	2400
Expanded Grid Mesh	EGM 30080	30	75	3.0	8.0	1200	2400
	EGM 50075	25	75	5.0	7.5	1200	2400
	EGM 50105	30	75	5.0	10.5	1200	2400
	EGM 50080	42	135	5.0	8.0	1200	2400
	EGM 50110	45	135	5.0	11.0	1200	2400
Expanded Merapi Mesh	EMM 50050	75	200	5.0	5.0	1200	2400
	EMM 30050	75	200	3.0	5.0	1200	2400
Expanded Deco Mesh	EDM 30032	25	80	3.0	3.2	1200	2400

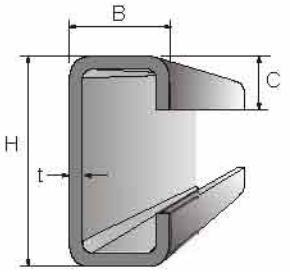
Material : JIS G 3131/ASTM A 830
Grade : SPHC/SAE 1006/1008
Tolerance : According to JIS G 3351

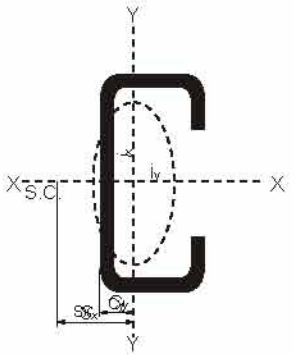
Tolerance on SW +/- 5%
Tolerance on LW +/- 2 mm
Tolerance on S + 25 mm, - 0 mm
Tolerance on L Value Given in JIS on Steel Sheet and Plate
Tolerance on T Value Given in JIS on Steel Sheet and Plate
Tolerance on Weight +/- 10 %
Deflection 5 mm or less per 1000 mm and not more than 5 mm x (length mm/1000 mm) for overall length.

Lipped Channel

Our other line of products is the Lipped Channel. Our manufactured Lipped Channel is a good alternative for the hot/cold rolled channels as it offers some advantages over them, such as, Reduced thickness, Saving in cost. Lipped channels are used in applications such as Steel structures, Conveyor Guides , Storage Systems, Support Systems, Electrical Applications, Pollution Control Equipments, and Architectural Applications.

Standard Dimensional Tolerance	: JIS G 3350, ASTM 830 belum tersertifikasi
Standard Material	: JIS 3131 SPHC.SAE 1006/SAE 1008
Available Size	: CNP 100 x 50 x 2.0 to CNP 200 x 75 x 3.2
Annual Capacity	: 30.000 MT/Year





Dimension		Section Area	Unit Weight	Informative Reference									
				Geometrical Moment of Inertia		Modulus of Section		Radius of Gyration		Center of Grafity	Shear Center	Torsion Constant	Warping Constant
H x B x C mm	t mm	A cm^2	Kg /m	Ix cm^4	Iy cm^4	Zx cm^3	Zy cm^3	rx cm	ry cm	Cy cm	Xo cm	J cm^4	Cw cm^5
C 100 x 50 x 20	2	4.54	3.56	71	17	14.3	5.4	3.97	1.93	1.87	4.48	605	444
	2.3	5.17	4.06	81	19	16.1	6	3.95	1.92	1.86	4.46	912	496
	2.5	5.59	4.39	87	20	17.3	6.5	3.94	1.9	1.86	4.45	1164	528
	2.8	6.2	4.87	95	22	19.1	7.1	3.92	1.89	1.86	4.42	1621	574
	3	6.61	5.19	101	23	20.2	7.4	3.91	1.88	1.86	4.41	1982	603
	3.2	7.01	5.5	106	24	21.3	7.8	3.9	1.87	1.86	4.4	2392	630
C 125 x 50 x 20	2	5.04	3.95	120	18	19.3	5.5	4.89	1.91	1.69	4.15	672	675
	2.3	5.75	4.51	136	21	21.8	6.2	4.87	1.89	1.69	4.12	1013	755
	2.5	6.21	4.88	147	22	23.5	6.6	4.86	1.88	1.69	4.11	1295	805
	2.8	6.9	5.42	162	24	25.9	7.2	4.84	1.86	1.69	4.08	1804	877
	3	7.36	5.78	172	25	27.5	7.6	4.83	1.85	1.69	4.07	2207	922
	3.2	7.81	6.13	181	27	29	8	4.82	1.84	1.69	4.05	2665	965
C 150 x 50 x 20	2	5.54	4.35	185	19	24.7	5.6	5.79	1.87	1.55	3.86	738	971
	2.3	6.32	4.96	210	22	28	6.3	5.77	1.86	1.55	3.84	1115	1088
	2.5	6.84	5.37	226	23	30.2	6.8	5.75	1.85	1.55	3.82	1425	1162
	2.8	7.6	5.97	250	26	33.3	7.4	5.73	1.83	1.55	3.8	1987	1267
	3	8.11	6.37	265	27	35.4	7.8	5.72	1.82	1.54	3.78	2432	1334
	3.2	8.61	6.76	280	28	37.4	8.2	5.71	1.81	1.54	3.77	2938	1398
C 150 x 65 x 20	2	6.14	4.82	218	36	29.1	8.3	8.3	2.43	2.12	5.19	818	1784
	2.3	7.01	5.5	248	41	33	9.4	9.4	2.42	2.12	5.16	1236	2006
	2.5	7.59	5.96	267	44	35.6	10	10	2.41	2.12	5.15	1581	2148
	2.8	8.44	6.63	295	48	39.4	11	11	2.39	2.12	5.13	2207	2352
	3	9.01	7.07	314	51	41.8	11.6	11.6	2.38	2.11	5.11	2702	2482
	3.2	9.57	7.51	332	54	44.2	12.2	12.2	2.37	2.11	5.09	3265	2608
C 200 x 75 x 20	2	7.54	5.92	467	56	46.7	10.6	10.6	2.73	2.2	5.49	1005	4571
	2.3	8.62	6.77	531	64	53.1	12	12	2.72	2.2	5.47	1520	5159
	2.5	9.34	7.33	573	68	57.3	12.9	12.9	2.71	2.2	5.45	1946	6637
	2.8	10.4	8.17	636	75	63.6	14.2	14.2	2.69	2.2	5.42	2719	6085
	3	11.11	8.72	676	80	67.6	15	15	2.68	2.19	5.41	3332	6437
	3.2	11.81	9.27	716	84	71.6	15.8	15.8	2.67	2.19	5.39	4030	6779

Technical Specification

Material : JIS G 3131 / ASTM 830, Symbol : SPHC/ SAE 1006/ SAE 1008
Standard length : 6 Meters, Dimention Tolerance : JIS G 3350

Non standard length is available on request subject to minimum quantity.
We provide additional services for standard drilling and punching.
Shotblasting, painting and galvanizing are available on request.

SNI 07-0138-1987

Dimension		Section Area	Unit Weight	Informative Reference									
				Geometrical Moment of Inertia		Modulus of Section		Modulus of Gyration		Center of Grafity	Shear Center	Torsion Constant	Warping Constant
H x B x C mm	t mm	A cm^2	Kg /m	Ix cm^4	Iy cm^4	Zx cm^3	Zy cm^3	rx cm	ry cm	Cy cm	Xo cm	J cm^4	Cw cm^6
C 100 x 50 x 20	2.0	4.437	3.56	71	17	14.3	5.4	3.97	1.93	1.87	4.48	605	444
	2.3	5.172	4.06	81	19	16.1	6.0	3.95	1.92	1.86	4.46	912	496
	2.8	6.205	4.87	95	22	19.1	7.1	3.92	1.89	1.86	4.42	1621	574
	3.2	7.007	5.50	106	24	21.3	7.8	3.90	1.87	1.86	4.40	2392	630
C 125 x 50 x 20	2.3	5.747	4.51	136	21	21.8	6.2	4.87	1.89	1.69	4.12	1013	755
	3.2	7.807	6.13	181	27	29.0	8.0	4.82	1.84	1.68	4.05	2665	965
C 150 x 50 x 20	2.3	6.32	4.96	210	22	28.0	6.3	5.77	1.86	1.55	3.84	1115	1088
	3.2	8.607	6.76	280	28	37.4	8.2	5.71	1.81	1.54	3.77	2938	1398
C 150 x 65 x 20	2.3	7.01	5.50	248	41	33.0	9.4	5.94	2.42	2.12	5.16	1236	2006
	3.2	9.57	7.51	332	54	44.2	12.2	5.89	2.37	2.11	5.09	3265	2608
C 200 x 75 x 20	3.2	11.81	9.27	716	84	71.6	15.8	7.79	2.67	2.19	5.39	4030	6779

Chemical Composition

- Carbon (C) : 0.25 % max
- Phosphor (p) : 0.05 % max
- Sulfur (s) : 0.05 % max

Mechanical Properties

- Tensile Strength : 176.4 N/mm^2 min
- Yield Strenth : 333.2 N/mm^2 min
- **Elongation** : 21 % min

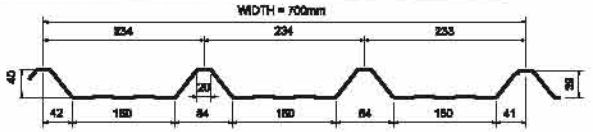
Tolerance

- **Thickness ≤ 2.3 mm** : ± 0.24 mm
  ≤ 3.2 mm : ± 0.3 mm
- **High (H) ≤ 125 mm** : ± 1.5 mm
  ≤ 250 mm : ± 2.0 mm
- **Width (B) ≤ 75 mm** : ± 2.0 mm
- **Lip (C) ≤ 25 mm** : ± 2.0 mm
- Length 6 - 7 M : ± 40 mm

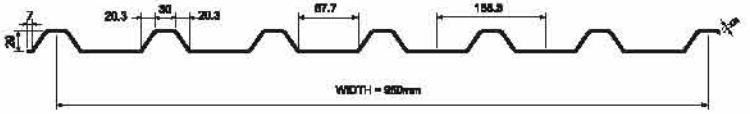
Roof & Wall Sheeting

To provide an increase variety of products under our range, we also produce roof and wall sheeting. This Roof and wall sheeting are popular on virtually all types of buildings due to its weathertightness, durability, and design flexibility, energy efficient, cost effective, and allow for thermal movement. Our roof and wall sheeting come in a variety of profiles, material, and finishes. These panels are ideal to be on industrial plants, manufacturing plants, warehouses, and a variety of other applications and can be used as either a roofing panel or a siding panel.

Standard & Specification : Material SGCC Z 22 / AS1397 G300 & G550
Available Size : R 700 x 0.4 to R 945 x 0.55
R 950 x 0.4 to R 950 x 0.55
W 950 x 0.4 to W 950 x 0.55



TYPE - R700



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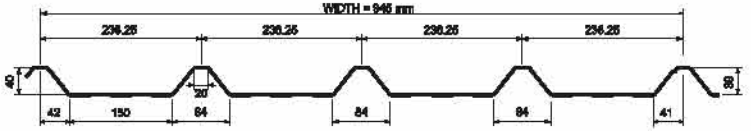
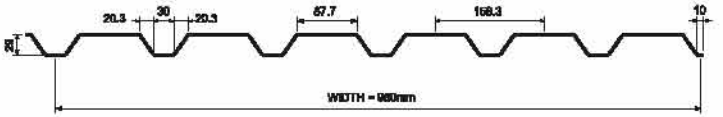


TYPE - R945



TYPE - W950

JIS G 3302

Type	Zincalume			Colorbond		
	Panel Thickness	Weight		Panel Thickness	Weight	
	mm	Kg/m²	Kg/m¹	mm	Kg/m²	Kg/m¹
R 700 (Roof)	0.4	3.31	3.03	0.4	3.37	3.08
	0.45	3.7	3.38	0.45	3.76	3.44
	0.5	4.1	3.75	0.5	4.16	3.8
	0.55	4.49	4.1	0.5	4.55	4.16
R 945 (Roof)	0.4	3.31	3.97	0.4	3.37	4.04
	0.45	3.7	4.44	0.45	3.76	4.51
	0.5	4.1	4.92	0.5	4.16	4.99
	0.55	4.49	5.39	0.55	4.55	5.46
R 950 (Roof)	0.4	3.31	3.97	0.4	3.37	4.04
	0.45	3.7	4.44	0.45	3.76	4.51
	0.5	4.1	4.92	0.5	4.16	4.99
	0.55	4.49	5.39	0.55	4.55	5.46
W 950 (Wall)	0.4	3.31	3.97	0.4	4.75	4.04
	0.45	3.7	4.44	0.45	5.25	4.51
	0.5	4.1	4.92	0.5	5.76	4.99
	0.55	4.49	5.39	0.55	6.24	5.46

Note :

Width tolerance = ± 15mm

Thickness tolerance = ± 0.05mm

Length tolerance = - 0.0mm & + 45mm

(Max. tolerance value is for 6m or over specified length).

Also available product accesories : Caping, Flashing & Trim, Gutter & Downspout.

Bar & Wire Products









Wire Rod

In support to the building and construction industry, we also produce Wire Rod. Wire Rod is a rolled steel product, produced from a billet and having a round, rect-angular or other cross-section. Particularly fine cross-section may be achieved by subsequent cold forming (drawing). Wire rod is used for many different products. Depending upon how it is cold formed and heat treated, wire is used, for example, to produce not only wire ropes, barbed wire, wire mesh and nails, but also springs, welded wire mesh and reinforcement wire. Our wire diameters ranging from 5.5mm to 13mm (rod) and 14mm to 40mm (bar in coil).

Standard & Specification : JIS G 3505
Available Size : Bar in coil : 14mm - 40mm
Wire Rod : 5.5mm - 13mm
Deformed Bar : 13mm - 51mm
Round Bar : 10mm - 50mm
Annual Capacity : 300.000 MT/Year

LOW CARBON STEEL WIRE RODS

Code	Diameter (mm)		Out of Round (mm)
	Nominal	Tolerance	Tolerance
WR 5.5	5.5	± 0.5	0.64 max
WR 5.8	5.8	± 0.5	0.64 max
WR 6.4	6.4	± 0.5	0.64 max
WR 7.4	7.4	± 0.5	0.64 max
WR 8.4	8.4	± 0.5	0.64 max
WR 9.4	9.4	± 0.5	0.64 max
WR 10.4	10.4	± 0.5	0.64 max
WR 11.0	11.0	± 0.5	0.64 max
WR 12.0	12.0	± 0.5	0.64 max
WR 13.0	13.0	± 0.5	0.64 max

We also produce half sizes like 6.5 ; 7.5 ; 8.5 ; 9.5 ; 10.5 ; 11.5 ; 12.5 mm

CHEMICAL COMPOSITION

Class	Chemical Composition %			
	C	Mn	P	S
SWRM 06	0.08 max	0.60 max	0.045 max	0.045 max
SWRM 08	0.10 MAX	0.60 max	0.045 max	0.045 max
SWRM 10	0.08 to 0.13	0.30 to 0.60	0.045 max	0.045 max
SWRM 15	0.13 to 0.18	0.30 to 0.60	0.045 max	0.045 max
SWRM 20	0.18 to 0.23	0.30 to 0.60	0.045 max	0.045 max

We can also deliver wire rods in equivalent grades.

BAR IN COIL (WIRE ROD)

Code	Diameter (mm)		Out of Round (mm)
	Nominal	Tolerance	Tolerance
BIC 14	6.4	± 0.5	0.64 max
BIC 17	7.4	± 0.5	0.64 max
BIC 19	8.4	± 0.5	0.64 max
BIC 20	9.4	± 0.5	0.64 max
BIC 22	10.4	± 0.5	0.64 max
BIC 25	11.0	± 0.5	0.64 max
BIC 28	12.0	± 0.5	0.64 max
BIC 40	13.0	± 0.5	0.64 max

Annealed Wire

Another variation to our wire products is the Annealed Wire. Annealed Wire is obtained by means of thermal annealing, endowing it with the properties it needs for its main use - setting. Soft annealed wire offers excellent flexibility and softness through the process of oxygen free annealing. This wire is deployed both in civil construction and in agriculture. Hence, in civil construction annealed wire, also known as "burnt wire" is used for iron setting, tie wire or baling wire in building, parks and daily binding.

Standard & Specification : JIS G 3532
Available Size : Diameter 0.8mm - 3mm
Annual Capacity : 3.600 MT/Year

REFER TO JIS G3532 - SWMA / SNI 07-0040-2006 BJ K.L

No.	Product	Nominal Diameter (mm)	Tol. Ø (mm)	Tensile Strength (N/mm²)	Torsion (Nr)
1	AW 0.80	0.80	± 0.04	-	-
2	AW 0.90	0.90	± 0.04	-	-
3	AW 2.00	2.00	± 0.06	260 - 590	55
4	AW 3.00	3.00	± 0.06	260 - 590	36

Galvanized Wire

Our galvanized wire are made from high grade billets and processed with advanced processing technology and it comes in Low Carbon Light Coating (LLC) and Low Carbon Heavy Coating (LHC) variant. Various diameter and zinc coating gramature can be set to suit the uses in for communication devices, medical treatment equipment, weaving of wire mesh, making of brushes, steel rope, filter wire mesh, high pressure pipes, construction, arts and crafts, etc.

Standard & Specification	: JIS G 3547
Available Size	: Ø 1.6mm - Ø 4.27mm
Annual Capacity	: 42.000 MT/Year

Low Carbon Light Coating (LLC)

Refer to JIS G3547 - SWMGS2 / SNI 07-0040-2006 Bj KS

Sifat Mekanis	Satuan	LLC-8 (4.19 mm)	LLC-10 (3.40 mm)	LLC-12 (2.77 mm)	LLC-14 (2.11 mm)	LLC-16 (1.65 mm)
Ø Kawat	mm	4.11 - 4.27	3.32 - 3.48	2.70 - 2.84	2.04 - 2.18	1.60 - 1.70
Zinc Coating (min)	Gr/m²	50	50	50	50	50
Elongasi (min)	%	10	10	10	10	10
Tensile Strength	(N/mm²)	290 - 540	290 - 540	290 - 540	290 - 540	290 - 540
Adhesion Test	xD	2D	2D	2D	2D	2D

Low Carbon Heavy Coating (LHC)

Refer to BS 443-1982 / SNI 03-6154-1999

Sifat Mekanis	Satuan	LHC 4.00 mm	LHC 3.40 mm	LHC 3.00 mm	LHC 2.70 mm	LHC 2.20 mm	LHC 2.00 mm
Ø Kawat	mm	3.92 - 4.08	3.84 - 3.52	2.88 - 3.12	2.59 - 2.81	2.12 - 2.28	1.92 - 2.08
Zinc Coating (min)	Gr/m²	290	275	275	260	240	240
Uniformity		1'/3X + ½' 1X	1'/3X + ½' 1X	1'/3X + ½' 1X	1'/3X + ½' 1X	1'/3X	1'/3X
Torsion (min)	Nr	21	26	26	28	38	38
Tensile Strength	(N/mm²)	402 - 520	402 - 520	402 - 520	402 - 520	402 - 520	402 - 520
Adhesion Test	xD	5D	4D	4D	4D	4D	4D

Nail Wire

Made from high grade billets and processed with an advanced processing technology, our nail wires have excellent corrosion resistance, excellent heading & forming ability with low work hardening quality. Various range of diameter and tensile strength are available for making any kind of common nails that suits your needs.

Standard & Specification : JIS A 5508, JIS G 3505 & SNI 05-0323-1999
Available Size : Length 33mm - 125mm,
Shank 2.15mm - 5.20mm,
Head 5.1mm - 10.3mm
Annual Capacity : 14.400 MT/Year

Refer to JIS G3532 - SWMB & SWMN / SNI 07-0040-2006 Bj K.B & Bj K.P

No.	Product	Nominal Diameter	Tol. Ø (mm)	Tensile Strength (N/mm^2)	Application
1	RDW - 6	5.16	± 0.05	460 - 610	Refer to JIS G3532 - 2000 type :
2	RDW - 7	4.57	± 0.05	540 - 790	- SWMB : Drawn steel wire is applicated for general purposed
3	RDW - 8	4.19	± 0.05	600 - 860	- SWMN : Drawn steel wire is applicated for nail product
4	RDW - 9	3.76	± 0.05	640 - 880	
5	RDW - 10	3.40	± 0.04	680 - 920	Refer to SNI 07-0040-2006 type :
6	RDW - 11	3.05	± 0.04	700 - 960	- Bj K.B : Cooled drawn steel wire is applicated for general purposed
7	RDW - 12	2.77	± 0.04	720 - 980	- Bj K.P : Cooled drawn steel wire is applicated for nail product
8	RDW - 13	2.41	± 0.04	780 - 1000	
9	RDW - 14	2.11	± 0.04	820 - 1100	

NAILS

The smallest of building components, A nail consists of a metal rod or shank, pointed at one end and usually having a formed head at the other, that can be hammered into pieces of wood or other materials to fasten them together. Our nails are made from our own produced nail wire, ensuring the quality is maintained. It comes with 2.03mm to 5.29mm diameter and 36.8mm to 130.4mm long.

Standard & Specification : JIS A 5508, JIS G 3505 & SNI 05-0323-1999
Available Size : Length 33mm - 125mm,
Shank 2.15mm - 5.20mm,
Head 5.1mm - 10.3mm
Annual Capacity : 5.400 MT/Year

Refer to JIS A5508 TYPE N-FC-SM

No.	Type	Length		Shank		Length of point (mm)	Head	
		Nominal Length (mm)	Tolerance (mm)	ø (mm)	Tolerance (mm)		ø (mm)	Angle
1	PKU 1½"	38	± 2.0	2.15	± 0.06	1.7 - 4.3	5.1	± 120°
2	PKU 2"	50	± 2.5	2.75	± 0.06	2.2 - 5.5	6.6	± 120°
3	PKU 2½"	65	± 3.0	3.05	± 0.08	2.4 - 6.1	7.3	± 120°
4	PKU 3"	75	± 3.5	3.40	± 0.08	2.7 - 6.8	7.9	± 120°
5	PKU 3½"	90	± 4.0	3.75	± 0.08	3.0 - 7.5	8.8	± 120°
6	PKU 4"	100	± 4.5	4.20	± 0.10	3.4 - 8.4	9.8	± 120°
7	PKU 5"	125	± 5.0	5.20	± 0.10	3.7 - 9.2	10.3	± 120°

Round & Deformed Bar

As the main building materials in many construction work, our round and deformed bar range will assist any construction and engineering project with the product quality assurance of GRP. Round / deformed bar also commonly known as Steel Reinforcing bars are produced by pouring molten steel into casters and then running it through a series of stands in the mill, which shape the steel into reinforcing bars. The cross hatchings, called "deformations," help transfer the load between concrete and steel. For buildings, bridges, highways and runways, the cast-in-place concrete "body" and shop-fabricated steel "musculature" of reinforcing bar will work in tandem to create one of the most durable and most economical composite materials.

Standard & Specification	: JIS G 3112, JIS G 3191
Available Size	: Round Bar; Diameter 10mm - 50mm, Deformed Bar; Diameter 10mm - 32mm
Annual Capacity	: 200.000 MT/Year

ROUND BAR/PLAIN BAR / BETON POLOS - ACCORDING TO JIS 3112

Code	Diameter (mm)		Weight (kg/mm)		Cross Section Luas Penampang
	Product	Tolerance	Nominal	Tolerance	(mm^2)
RB 10	10	± 0.4	0.617	6 %	78.5
RB 12	12	± 0.4	0.888	6 %	113.1
RB 14	14	± 0.4	1.208	6 %	153.9
RB 16	16	± 0.5	1.578	5 %	201.1
RB 19	19	± 0.5	2.226	5 %	283.5
RB 22	22	± 0.5	2.984	5 %	380.1
RB 25	25	± 0.5	3.853	5 %	490.9
RB 28	28	± 0.6	4.833	4 %	615.8
RB 32	32	± 0.6	6.313	4 %	804.2
RB 50	50	± 0.8	17.40	4 %	1963.5

DEFORMED BAR / BETON ULIR - ACCORDING TO JIS 3112

Code	Diameter (mm)		Weight (kg/mm)		Cross Section Luas Penampang	h Tinggi Sirip	p Jarak Sirip	b Lebar Rusuk
	Product	Tolerance	Nominal	Tolerance	(mm^2)	(mm)	(mm)	(mm)
DB 13	13	± 0.4	1.04	6 %	132.7	0.7	9.1 max	10.2 max
DB 16	16	± 0.5	1.58	6 %	201.1	0.8	11.2 max	12.6 max
DB 19	19	± 0.5	2.23	6 %	283.5	1.0	13.3 max	14.9 max
DB 22	22	± 0.5	2.98	5 %	380.1	1.1	15.4 max	17.3 max
DB 25	25	± 0.5	3.85	5 %	490.9	1.3	17.5 max	19.7 max
DB 29	29	± 0.6	5.18	5 %	662.5	1.5	20.3 max	22.8 max
DB 32	32	± 0.6	6.31	5 %	804.2	1.6	22.4 max	25.1 max
DB 36	36	± 0.6	7.99	4 %	1017.8	1.8	25.2 max	28.3 max
DB 40	40	± 0.8	9.07	4 %	1256.6	2.0	28.0 max	31.4 max
DB 51	51	± 0.8	16.04	4 %	2042.8	2.5	35.0 max	39.3 max

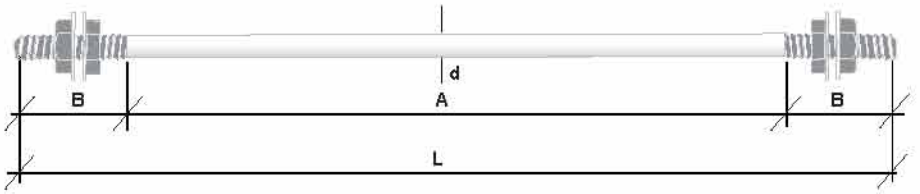
MECHANICAL PROPERTIES / SIFAT MEKANIS

Type	Symbol of Grade	Batas Ulur Yield Point	Kuat Tarik Tensile Point	Regang Elongation	Bendability (Uji Lengkung)	
		(min N/mm^2)	(min N/mm^2)	(% min)	Angle	Radius
Round Bar	SR 24	235	380	20	180°	3 x d
Round Bar	SS 400	235	400	20	180°	3 x d
Deformed	SD 35	345	490	18	180°	4 x d
Deformed	SD 40	390	560	18	180°	5 x d
Deformed	SD 50	490	620	12	90°	5 x d

SAGROD

Sagrod is another downstream product we produce at GRP, as part of our extensive product lines. Sag rods are sometimes used in connection with purlins to take the component of the loads which is parallel to the roof. It is also can be used as a tie and (in most applications) capable of carrying tensile loads only.

Standard & Specification	: JIS G 3112, JIS G 3191
Available Size	: Diameter 10mm - 25mm
Annual Capacity	: 1.000 MT/Year



MECHANICAL PROPERTIES / SIFAT MEKANIS

Type	Diameter d	L	A	B	Weight	Nuts			Washer Size				For Span of Purlin/ Girt	
						Size	Thickness (mm)		Outsider Diameter	Outsider of Hole	Thickness mm			
	mm	mm	mm	mm	kg	mm	max	min	mm	mm	max	min	max	min
SR-01-01		1600	1400	100	1.421								1550	1450
SR-01-02		1500	1300	100	1.332								1450	1350
SR-01-03		1400	1200	100	1.243								1350	1250
SR-01-04		1300	1100	100	1.154								1250	1150
SR-01-05	12	1200	1000	100	1.066	12	10.0	9.64	26	13	3.6	2.8	1150	1050
SR-01-06		1100	900	100	0.977								1050	950
SR-01-07		600	400	100	0.533								550	450
SR-01-08		500	300	100	0.444								450	350
SR-02-01		1600	1400	100	2.525								1550	1450
SR-02-02		1500	1300	100	2.367								1450	1350
SR-02-03		1400	1200	100	2.209								1350	1250
SR-02-04		1300	1100	100	2.051								1250	1150
SR-02-05	16	1200	1000	100	1.894	16	13.0	12.57	32	17	5.0	4.0	1150	1050
SR-02-06		1100	900	100	1.736								1050	950
SR-02-07		600	400	100	0.947								550	450
SR-02-08		500	300	100	0.789								450	350

Tolerance (mm)		
Diameter d	Total Length L	Thread Length B
± 0.5	± 10	± 2

NOTES :

- Round Bar Material :- Grade SR 24 / JIS G 3112
  - Tensile strength min. = 380 N/mm²
  = 520 N/mm²

- Thread 1.75 P for Nuts size 12
  2.0 P for Nuts size 16
- Nut & Washer : Grade BS 4.6 (min)

WIRE MESH

Our pre-fabricated rebar mesh is made of high quality steel bar produced from our own quality steel and are welded together to form a pre-made mesh section. With different sizes, the pre-made section is leveled and flat with sturdy structure. Depending on the size, our mesh section can be used for road construction, fences, racks, concrete walls and floors for factory and commercial buildings. It has been rust-proofed to stand against weather elements. Our mesh section can be supplied in rolls or panels.

Standard & Specification : JIS G 3551
Available Size : Diameter; 4.8mm - 10.2mm
Dimension; 5.4mtr x 2.1mtr
Annual Capacity : 13.200 MT/Year

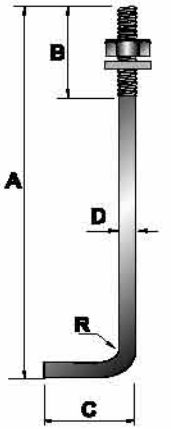
Refer to JIS G3551 - WFR

No.	Specification	Units	WMS 5	WMG 5	WMS 6	WMG 6	WMS 7	WMS 8	WMS 9	WMS 10
A. Material / Ribs Wire										
1.	Diameter	mm	4.80 - 5.20		5.80 - 6.20		6.80 - 7.20	7.80 - 8.20	8.80 - 9.20	9.80 - 10.20
2.	Weight/Unit Length	gr/m	142 - 167		207 - 237		285 - 319	375 - 415	477 - 522	592 - 641
3.	Tensile Strength	N/mm^2	min 490		min 490		min 490	min 490	min 490	min 490
4.	Yeild Strength	N/mm^2	min 400		min 400		min 400	min 400	min 400	min 400
5.	Elongation	%	min 8		min 8		min 8	min 8	min 8	min 8
B. Product / Wire Mesh										
1.	Type	unit	sheet	roll	sheet	roll	sheet	sheet	sheet	sheet
2.	Number of Line Wire	pcs	15	15	15	15	15	15	15	15
3.	Number of Cross Wire	pcs	36	360	36	360	36	36	36	36
4.	Pitch (Length x Width)	mm	150 x 150		150 x 150		150 x 150	150 x 150	150 x 150	150 x 150
5.	Dimension (Length x Width)	M	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1	5.4 x 2.1
6.	Packaging	units/pcg	25	1	25	1	20	20	15	15

ANCHOR BOLT

An additional downstream product under our range is the anchor bolt. These anchor bolt are usually used and embedded in concrete and used to support structural steel columns, light poles, highway sign structures, bridge rail, equipment, and many other applications. Our anchor bolt comes with 16mm, 19mm and 22mm.

Standard & Specification : JIS G 3112, JIS G 3191
Available Size : Ø 12mm - Ø 25mm
Annual Capacity : 1.000 MT/Year



DIMENSION PROPERTIES

Part Number	Bar Diameter (D)	A	Tread Length (B)	C	Radius (r)	Vertical Embedment Length (Ld)	Total Length	Nut
	mm	mm	mm	mm	mm	mm	mm	
STD-00-IAB016	16	560	100	100	25	460	630	M-16
STD-00-IAB019	19	675	125	120	25	550	765	M-20
STD-00-IAB022	22	755	125	130	50	630	840	M-22

Tolerances :
- Diameter (D) = ± 0.5
- A = ± 5
- B = ± 2
- C = ± 2

Certification acquired by PT. Gunung Raja Paksi

BIRO KLASIFIKASI INDONESIA
SERTIFIKAT PERSETUJUAN PABRIK PEMBUAT
Certificate of Manufacturer Approval

Pelat Baja
Steel Plate

No. 12.0056 MA

Dengan ini dinyatakan bahwa
This is to certify that

PT. GUNUNG RAJA PAKSI
Jl. Imam Bonjol No. 4, Warung Bongkok, Desa Sukadanau
Cikarang Barat – Bekasi 17520

telah disetujui sesuai dengan persyaratan peraturan BIRO KLASIFIKASI INDONESIA untuk
has been approved accordance with the requirements of the rules of BIRO KLASIFIKASI INDONESIA for

PEMBUATAN PELAT BAJA KAPAL
The manufacture of steel ship plates

BIRO KLASIFIKASI INDONESIA harus diberitahu terhadap setiap perubahan yang dapat mempengaruhi validitas Sertifikat ini.
BIRO KLASIFIKASI INDONESIA is to be notified of any changes that may affect the validity of this Certificate

Tempat/tgl dan No. Laporan Pemeriksaan : PT. Gunung Raja Paksi 28.12.2011 s/d 13.04.2012 0640-TP/C1/2012
Place/date and Survey Report No.

Sertifikat ini berlaku sampai dengan : 10 Maret 2015
This certificate is valid until

Dikeluarkan di Jakarta, 1 Juni 2012
Issued at Jakarta, on

BIRO KLASIFIKASI INDONESIA

Direktur Utama
President Director,

WIBOWO, MBA

Lihat rincian kondisi persetujuan pada halaman belakang
See the details of approval conditions on the reverse side

F34.1 01-2008

BIRO KLASIFIKASI INDONESIA
SERTIFIKAT PERSETUJUAN PABRIK PEMBUAT
Certificate of Manufacturer Approval

Pelat Baja
Steel Plate

No. 12.0057 MA

Dengan ini dinyatakan bahwa
This is to certify that

PT. GUNUNG RAJA PAKSI
Jl. Imam Bonjol No. 4, Warung Bongkok, Desa Sukadanau
Cikarang Barat – Bekasi 17520

telah disetujui sesuai dengan persyaratan peraturan BIRO KLASIFIKASI INDONESIA untuk
has been approved accordance with the requirements of the rules of BIRO KLASIFIKASI INDONESIA for

PEMBUATAN PELAT BAJA KAPAL DALAM BENTUK GULUNGAN
The manufacture of hot coil steel ship plates

BIRO KLASIFIKASI INDONESIA harus diberitahu terhadap setiap perubahan yang dapat mempengaruhi validitas Sertifikat ini.
BIRO KLASIFIKASI INDONESIA is to be notified of any changes that may affect the validity of this Certificate

Tempat/tgl dan No. Laporan Pemeriksaan : PT. Gunung Raja Paksi 28.12.2011 s/d 13.04.2012 0663-TP/C1/2012
Place/date and Survey Report No.

Sertifikat ini berlaku sampai dengan : 25 Juni 2015
This certificate is valid until

Dikeluarkan di Jakarta, 1 Juni 2012
Issued at Jakarta, on

BIRO KLASIFIKASI INDONESIA

Direktur Utama
President Director,

WIBOWO, MBA

Lihat rincian kondisi persetujuan pada halaman belakang
See the details of approval conditions on the reverse side

F34.1 01-2008

APPROVAL CERTIFICATE for MATERIALS

PT. GUNUNG RAJA PAKSI

HIGHER STRENGTH HULL STEEL ROLLED PRODUCTS

PT. GUNUNG RAJA PAKSI
Jl. Imam Bonjol 4, Warung Bongkok
Desa Sukadanau, Cikarang Barat, Bekasi
West Java, Indonesia
Indonesia

has been approved as a manufacturer in accordance with the requirements of Lloyd's Register Rule :-

Steel Plates and Hot Rolled Coil

This approval is subject to compliance with the Rules for the Manufacture, Testing and Certification of Materials. The full details of the processes and grades to which this approval applies are given in the Appendix of this certificate.

Lloyd's Register is to be notified of any change that may affect the validity of this Certificate.

This Certificate is issued to the above manufacturer and is valid until the date given below.

Valid Until : 14 November 2015
Date of Issue : 09 March 2014

Gavin Young

Lloyd's Register

BUREAU VERITAS
Certification

PT. GUNUNG RAJA PAKSI
JL. IMAM BONJOL 4, WARUNG BONGKOK, DESA SUKADANAU
CIKARANG BARAT BEKASI 17520
INDONESIA

Bureau Veritas Certification Holding SAS – UK Branch certify that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 14001:2004

Scope of certification

HOT ROLLED STEEL PLATE, AND COIL MANUFACTURING

Certification cycle start date: **22 January 2015**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **22 January 2018**

Original certification date: **22 January 2009**

Certificate No: **THA000949** Version 01, Revision date: **16 January 2015**

UKAS
009

Signed on behalf of BVCH SAS UK Branch

Certification body address: 60 Chiswell Street, London, EC1Y 4SE
Local office: Bureau Veritas Certification Indonesia, Wisma Bakrie, 9th Floor
Jl. HR Rasuna Said Kav. B-1, Jakarta 12920, Indonesia

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization
To check this certificate validity please call: +62(0) 804 00 222

BUREAU VERITAS
Certification

PT. GUNUNG RAJA PAKSI
JL IMAM BONJOL NO. 4 WARUNG BONGKOK SUKADANAU
CIKARANG BARAT BEKASI 17520
INDONESIA

Bureau Veritas Certification certify that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

OHSAS 18001:2007

Scope of certification

HOT ROLL PLATE AND COIL MANUFACTURING

Certification cycle start date: **11 July 2013**

Subject to the continued satisfactory operation of the organization's Management System, this certificate expires on: **10 July 2016**

Original certification date: **13 August 2007**

Certificate No. **IDN03130018** Version 01, Revision date: **10 July 2013**

Certification Authority

Certification body address: Bureau Veritas Certification Indonesia, Wisma Bakrie, 9th Floor
Jl. HR Rasuna Said Blok X-5 Kav. 3 Jakarta 12950 Indonesia

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization
To check this certificate validity please call: 62-21-2210280

Page 1 of 1

CERTIFICATION ACQUIRED BY PT. GUNUNG RAJA PAKSI


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
SERTIFIKAT PRODUK PENGGUNAAN TANDA SNI
(SPPT SNI)
PT. GUNUNG RAJA PAKSI


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
Lampiran


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
SERTIFIKAT PRODUK PENGGUNAAN TANDA SNI
(SPPT SNI)
PT. GUNUNG RAJA PAKSI


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
Lampiran


Kementerian Perindustrian
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SERTIFIKAT PRODUK PENGGUNAAN TANDA SNI
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PT. GUNUNG RAJA PAKSI


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
Lampiran


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
SERTIFIKAT PRODUK PENGGUNAAN TANDA SNI
(SPPT SNI)
PT. GUNUNG RAJA PAKSI
KAN


Kementerian Perindustrian
BALAI SERTIFIKASI INDUSTRI
Lampiran

NIPPON KAIJI KYOKAI

APPROVAL OF MANUFACTURING PROCESS

This is to certify that

PT. Gunung Raja Paksi
Bekasi, West Java
Indonesia

ClassNK

Lloyd's Register
LRQA

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

PT. Gunung Raja Paksi
Jl. Imam Bonjol 4, Warung Bongkok, Sukadanau
Cikarang Barat, Bekasi - West Java, Indonesia

has been approved by Lloyd's Register Quality Assurance
to the following Quality Management System Standards:

BS EN ISO 9001:2008
EN ISO 9001:2008
ISO 9001:2008
SNI ISO 9001:2008

The Quality Management System is applicable to:

Manufacturing of hot roll plates, cold rolled coils, coils, welded beams, plates cut to shape, pressed products, expanded mesh, ERW pipes, lipped channel, spiral pipe, wire rod, deformed bar, steel round bar, equal angle, bar in coil, galvanized wire, wire mesh, nails wire, nails and annealed wire.

Approval
Certificate No: JKT0500342

Original Approval: 17 February 2007
Current Certificate: 17 February 2014
Certificate Expiry: 16 February 2017

Issued by: PT. Lloyd's Register Indonesia
for and on behalf of Lloyd's Register Quality Assurance Limited

KAN

TÜV NORD

CERTIFICATE

Certification Body
of TÜV NORD Systems GmbH & Co. KG

certifies, that the company

PT GUNUNG RAJA PAKSI
Jl. Imam Bonjol 4, Warung Bongkok,
Sukadanau, Cibitung Bekasi 17520, Indonesia

has been verified and recognized as material manufacturer according to

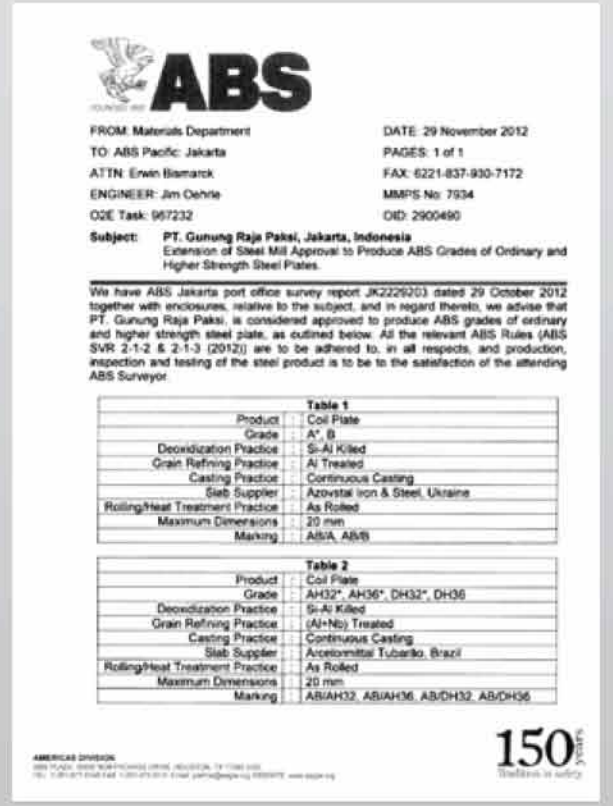
AD 2000-Merkblatt W0

Certificate-No.: 07-203-9030-WP-0905/13

This certificate is valid until

May 2016

Certification acquired by PT. Gunung Raja Paksi



ABS

FROM: Materials Department
TO: ABS Pacific: Jakarta
ATTN: Erwin Bismarck
ENGINEER: Jim Oehrle
O2E Task: 967232

DATE: 29 November 2012
PAGES: 1 of 1
FAX: 6221-837-930-7172
MMPS No: 7934
OID: 2900490

Subject: **PT. Gunung Raja Paksi, Jakarta, Indonesia**
Extension of Steel Mill Approval to Produce ABS Grades of Ordinary and Higher Strength Steel Plates.

We have ABS Jakarta port office survey report JK2229203 dated 29 October 2012 together with enclosures, relative to the subject, and in regard thereto, we advise that PT. Gunung Raja Paksi, is considered approved to produce ABS grades of ordinary and higher strength steel plate, as outlined below. All the relevant ABS Rules (ABS SVR 2-1-2 & 2-1-3 (2012)) are to be adhered to, in all respects, and production, inspection and testing of the steel product is to be to the satisfaction of the attending ABS Surveyor.

Table 1

Product	Coil Plate
Grade	A*, B
Deoxidization Practice	Si-Al Killed
Grain Refining Practice	Al Treated
Casting Practice	Continuous Casting
Slab Supplier	Azovstal iron & Steel, Ukraine
Rolling/Heat Treatment Practice	As Rolled
Maximum Dimensions	20 mm
Marking	AB/A, AB/B

Table 2

Product	Coil Plate
Grade	AH32*, AH36*, DH32*, DH36
Deoxidization Practice	Si-Al Killed
Grain Refining Practice	(Al+Nb) Treated
Casting Practice	Continuous Casting
Slab Supplier	Arcelormittal Tubarão, Brazil
Rolling/Heat Treatment Practice	As Rolled
Maximum Dimensions	20 mm
Marking	AB/AH32, AB/AH36, AB/DH32, AB/DH36

AMERICAS DIVISION

150 years Tradition in safety

ABS

Table 3

Product	Plate
Grade	AH32*, AH36*, DH32*, DH36*, EH32*, EH36*, FH32*, FH36
Deoxidization Practice	Si-Al Killed
Grain Refining Practice	(Al+Nb) Treated
Casting Practice	Continuous Casting
Slab Supplier	Arcelormittal Tubarão, Brazil
Rolling/Heat Treatment Practice	Normalizing
Maximum Dimensions	80 mm
Marking	AB/AH32, AB/AH36, AB/DH32, AB/DH36, AB/EH32, AB/EH36, AB/FH32, AB/FH36 AB/AH32 Z35, AB/AH36 Z35, AB/DH32 Z35, AB/DH36 Z35, AB/EH32 Z35, AB/EH36 Z35, AB/FH32 Z35, AB/FH36Z35

Notes:
1. The approval of asterisk (*) superscripted grade(s) in the above table(s) are based on the qualification test data presented on the non-asterisk superscripted grade(s) in the same table, and hence, the derivative benefit grades are to be metallurgically equivalent (in terms of chemistry and processed identically) to the respective qualifying grade, in all respects.

Important Notice This approval is valid up to 28 November 2017, and it is to be renewed on/before the expiration date.

Best Regards,

for Gopal Magadi
Manager,
ABS Materials, Houston

AMERICAS DIVISION

150 years Tradition in safety

Approval of Material Manufacturers
Zulassung von Werkstoffherstellern

GL

P.T. GUNUNG RAJA PAKSI
BEKASI, WEST JAVA
INDONESIA

Normal and Higher Strength Hull Structural Steels
in accordance with the GL-Rules for Metallic Materials,
Chapter 2, Section 1.B

Unalloyed Steels for Welded Structures
in accordance with the GL-Rules for Metallic Materials,
Chapter 2, Section 1.C

Steels with Through Thickness Properties
in accordance with the GL-Rules for Metallic Materials,
Chapter 2, Section 1.I

Germanischer Lloyd

DNV

DET NORSKE VERITAS

APPROVAL OF MANUFACTURER

CERTIFICATE

CERTIFICATE NO. AMM-6448

This is to certify that

PT Gunung Raja Paksi

Cikarang Barat - Bekasi, Indonesia

is an approved manufacturer of

Rolled Steel Products

in accordance with

Det Norske Veritas' Rules for Classification Pt. 2

Offshore Standard DNV-OS-B101

and the following particulars:

Product	Plates, plates made from coils
Grades	See page 2
Steelmaking	Basic oxygen converter, Continuous casting
Deoxidation	Killed
Fine grain elements	See page 2
Delivery condition	See page 2
Max. thickness	See page 2

Place and date
Høvik, 2013-10-25
for DET NORSKE VERITAS AS

This Certificate is valid until
2017-12-31

Hanne Aoila Hjørpeland
Head of Section

Local Office
DNV Jakarta

Dechan Lua
Surveyor

DET NORSKE VERITAS AS

Page 1 of 3

ilac-MRA

KAN

SERTIFIKAT AKREDITASI

LP-786-IDN

PT. GUNUNG RAJA PAKSI LABORATORY

Jl. Imam Bonjol 4, Warung Bongkok, Desa Sukadanau
Cikarang Barat, Bekasi 17520

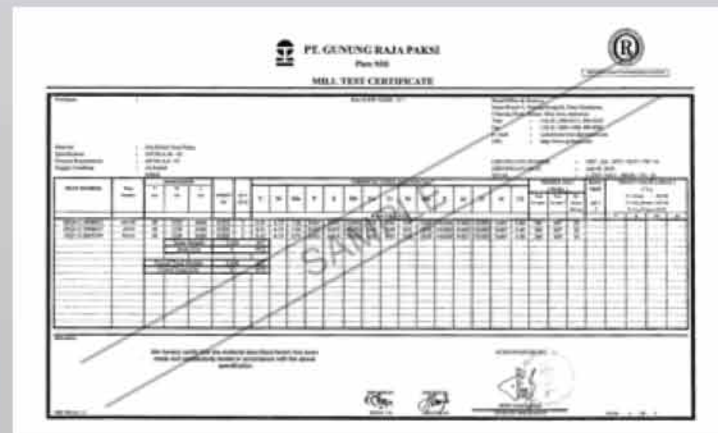
LABORATORIUM PENGUJI

SNI ISO/IEC 17025:2008 (ISO/IEC 17025:2005)
Persyaratan Umum Untuk Kompetensi Laboratorium Pengujian dan Laboratorium Kalibrasi

KOMITE AKREDITASI NASIONAL

Prof. Dr. BAMBANG PRASETYA

KETUA



PT. GUNUNG RAJA PAKSI

MILL TEST CERTIFICATE

SAMPLE

1. ENGINEERING FABRICATION CONSTRUCTION (EFC)

Established in 1997, our Engineering Fabrication Construction has been the trusted and dependable partner by our customers in its assistance in the consultation work for the engineering of steel structure for building's frame. The services provided by this centre include drafting/technical drawing, modeling, and pre-fabrication of components structure to field construction of the building on the project site.

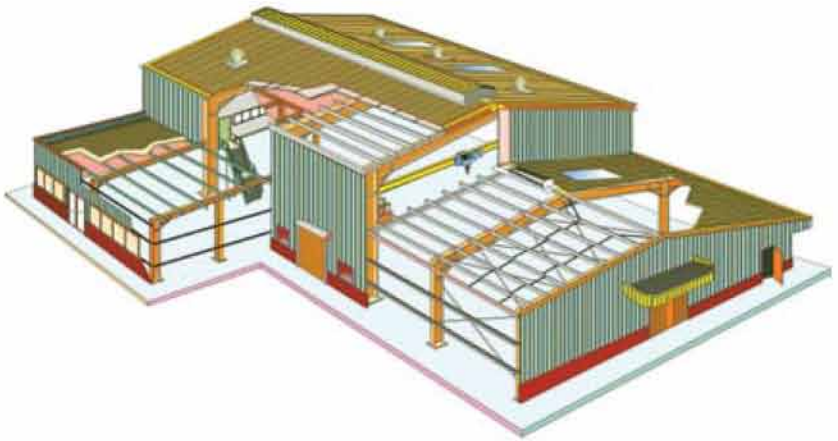
Our Engineering Fabrication Construction is equipped with the latest CNC machineries, digital 3D modeling, and supplied by first-rate material supplied by our Gunung Steel Group. Completed by staffs of top professional engineering team, our EFC will ensure our technical expertise and experience are able to respond to any engineering challenges presented to us. With years of experience in the steel engineering business, our Engineering Fabrication Construction has successfully developed the Pre-Engineered Building (PEB) concept, for easier building development.

Drawing software used:

- Design & Analysis: STAAD III Ver. 22.3
- Detailing: X-Steel Ver.5.4 & SteelCAD Ver. 4.1
- Nesting: Bar Nesting & Auto Nesting

EFC annual production capacity:

- Industrial & Commercial Building : approx. 48,000MT
- Bridge : approx. 20,000MT
- Steel Tower : approx. 18,000MT
- Galvanizing Facility : approx. 42,000MT



PRE-ENGINEERED BUILDING

Our Pre-Engineered Building concept developed by PT. Gunung Garuda will produce steel material for building construction that is inexpensive, more efficient and faster on its implementation, and improve the accuracy for the joining of the frame's components.

We recognize the difficulty in the pre-engineering phase to construct a building. In this phase it has traditionally involves different parties to design, draw, and fabricate the different steel components and steel joints that will form the frames of the building structure. With different parties involves in this process, it is possible that the resulting steel frames, steel joints or other components will not match upon installation.

To address this, with PEB concept and the assistance of our EFC, we will assist in performing all those work involved in this phase and to prepare all the steel frames and steel joining components at our facility, and to prepare this component materials ready for installation at the construction site, with improve joining accuracy.

With our PEB concept and EFC expertise in steel engineering, we will create a completed building frame that is suitable to be implemented where steel materials are most needed for the construction project in a the most economical way.

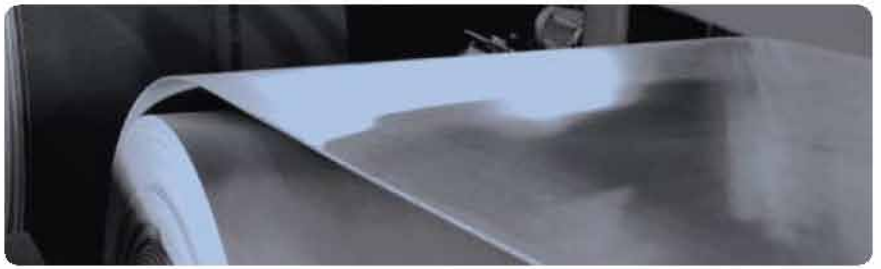
2. PLATE SERVICE CENTER (PSC)

PSC has a modern fabrication shop, supported by the state of the art facility can fabricate any critical items. Backed by, PLATE MILL for the raw material, just the next door and a dedicated team of well trained and qualified welders.

The facilities available at PSC are CNC Oxycutting M/c, Strip Cutting M/c, CNC Plasma Cutting, drilling & Punching M/c and 3000Ton Press Brake. Customers can order Flat Bar, any complicated Shapes to be cut, Punched, Drilled and Fabricated.

Besides Destructive Test, PSC also provide NDT (Non Destructive Test) such as; UT/Ultrasonic Test, DP/Dye Penetrant, and MPI/Magnetic Particle according by customer demand.

3. COIL SERVICE CENTER (CSC)



With our Coil Service Centre, we are able to provide cutting service for any of our steel coil products. With cut-to-length services, our CSC is able provide a customized standard of lengths and widths to meet any requested specifications.

At CSC, our machines is also outfitted with leveling process, to ensure any sheets taken from the coils are flattened when it has been turned into steel sheets. Additional quality check from our trained Quality Control staff will ensure the cutting quality and flatness level of the sheets we process before the it is delivered.

4. FORMING SERVICE CENTER (FSC)

At the Forming Service Centre, our company is able to produce a wide variety of products for the construction industry. These coil based products are cold formed into the final products for the uses in different applications.

The cold formed products we produced in this facility are:

ERW Round Pipe, Square Pipe, Rectangular Pipe, Lipped Channel, Expanded Mesh, Bridge Deck, Equal Angle & Unequal Angle.

5. BAR SERVICE CENTER (BSC)

Bar service center is wire (re-bar) forming facility. Our machinery and experienced workforce are able to provides individualized service for your custom wire forming. With our cut-to-length, bending and threading machines theres virtually unlimited possibilities of wire shapes. We can cut, thread and bend up to 2,5mm steel wire and with a high degree of accuracy.

Steel Applications

BUILDINGS

High Rise Buildings
- Apartment
- Hotel
- Office Building
- Landmark
- Gas Processing & Distribution
- Terminal & Cargo Handling System

Low Rise Buildings
- Housing / Residence
- Hospital
- Office Building
- Airport / Hangar
- School

Commercial Buildings
- Show Room
- Supermarket & Hypermarket

Industrial Buildings
- Air Pollution Control Equipment
- Cement Plants
- Chemical & Petrochemical Plant
- Factory
- Iron & Steel Mill
- Oil Refinery
- Pulp, Paper Mills & Wood Process
- Warehouse
- Workshop

BRIDGES

- Girder Bridging
- Truss Bridging
- Cantilever Bridging
- Arch Bridging
- Suspension Bridging
- Cable-stayed Bridging
- Railway Bridging

TOWERS

- Transmission Tower
- Substation Tower
- Telecomunication Tower
- Pole Tower
- Monumental Tower
- Billboard
- Monitoring Tower
- Watertank Tower

GUNUNG STEEL GROUP PRODUCT

1. GUNUNG GARUDA PRODUCT


Angle (HR)


Cell Form


H - Beam (HR)


Honey Comb


King Cross


Queen Cross


T-Beam


Wide Flange Beam (IWF)

2. GUNUNG RAJA PAKSI PRODUCT


Coil (Hot Rolled)


Cold Roll Coil (CRC)


Hot Roll Pickled Oil


Wire Rod

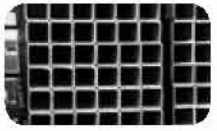

Galvanized Wire


Wire Nail


Annealed Wire


Nails


Rectangular Pipe


Square Pipe


ERW Pipe


Spiral Pipe


Bridge Deck


Roof & Wall Sheeting


Floor Deck


Lipped Channel


Steel Plate


Welded Beam


Angle CF


Wire Mesh


Round & Deformed Bar

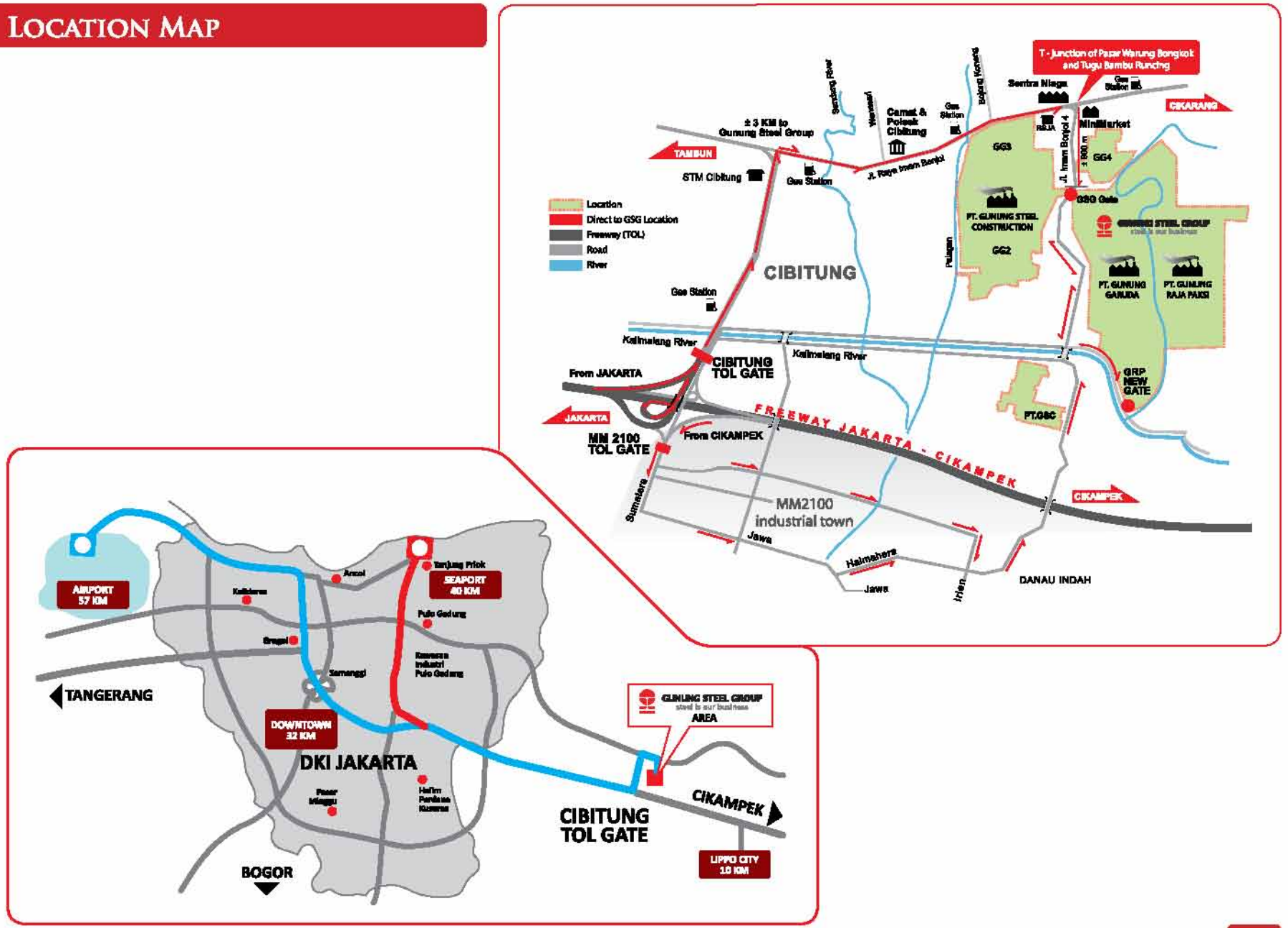

Sagrod


Anchor Bolt


Expanded Mesh

3. GALVANIZING SERVICES

Location Map



Head Office & Factory :
Jl. Perjuangan No. 8, Kp. Tangsi RT. 004/006
Sukadanau, Cikarang Barat, Bekasi 17530,
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Phone : +6221 - 8900111 (Hunting), 8900222
Fax. : +6221 - 8900555 / 8901588
Email : info@grdsteel.com

Jakarta Representative Office :
Jl. Pangeran Jayakarta 105 G
Jakarta 10730, Indonesia
Phone : +6221 - 6298031
Fax : +6221 - 6492734

www.gunungsteel.com

Rev. Feb 2017