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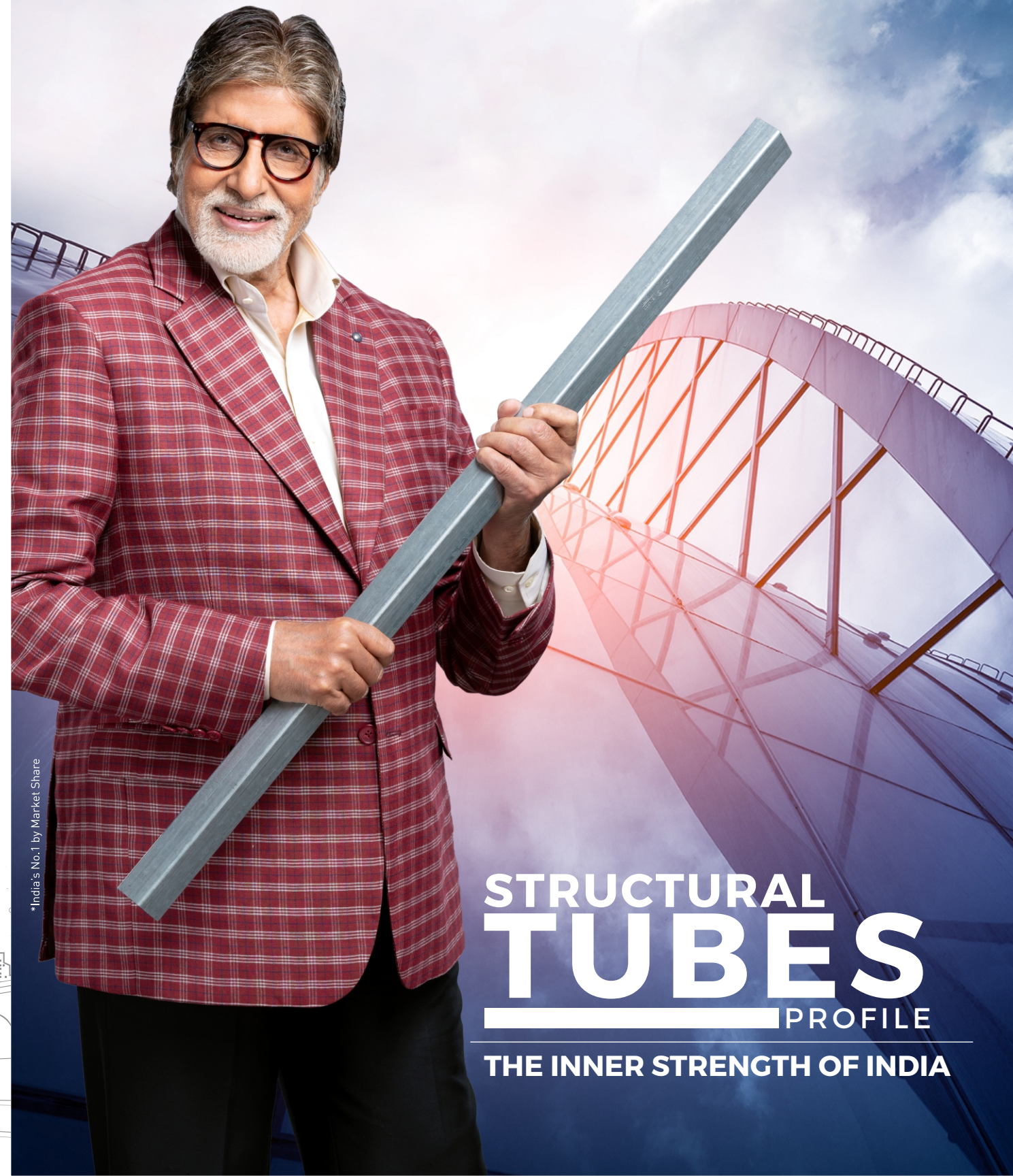
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INDIA'S
No. 1
STEEL PIPES COMPANY

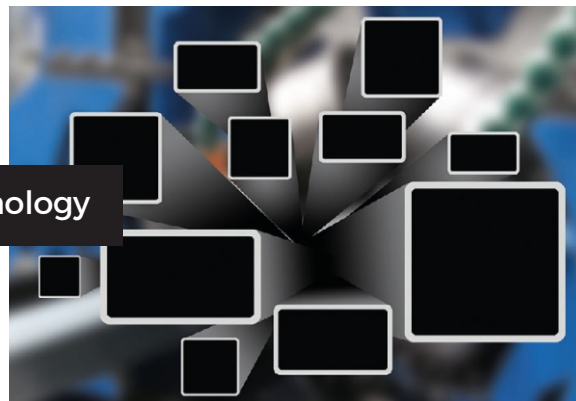


*India's No.1 by Market Share

**STRUCTURAL
TUBES**
PROFILE
THE INNER STRENGTH OF INDIA

Page No. 04

Direct Forming Technology



Page No. 06

Square Hollow Sections

Page No. 14

Rectangular Hollow Sections



Page No. 20

Circular Hollow Section

▪ Structural

COMPANY OVERVIEW

APL Apollo Tubes Limited is the largest producer of Electric Resistance Welded (ERW) steel pipes and tubes in India, with a capacity to produce more than 25.5 lakh tonnes per annum. It caters extensively to the region and exports to over 20 countries globally. The company's vast distribution network is spread across India, with warehouses and branch offices in 29 cities.

At APL Apollo believes in pioneering changes to cater to an ever evolving economy by infusing superior cutting-edge technology and innovation. Founded in 1986 in the capital city of Delhi, India, it has catapulted its growth over the last three decades by introducing a range of new products, improvising quality, increasing productivity, benchmarking the entire product line and eventually gaining the mind space of a large number of customers, therefore, redefining the market space for steel pipes business.

The organisation believes in measuring its success and pushing its limits through regular review and feedback generation. Customer centric approach and best practices from across the globe enables the organisation upscale the core business with creativity and purpose.

The Company's products are certified by reputed international agencies like SGS (France), CE (Europe) etc. It has received the Recognised Export House status and is also ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 certified. Additionally, all our products are BIS – marked.

DIRECT FORMING TECHNOLOGY (DFT)

A REVOLUTIONARY ITALIAN TECHNOLOGY IN INDIA

LATEST GLOBAL TECHNOLOGY FIRST TIME IN INDIA

This technology opens a new era in steel tube production. The use of Direct Forming Technology (DFT) is pioneered by APL Apollo in India and is the only company using this high tech production methodology in the most elaborate manner.

The DFT system is the result of many years of experience and know ledge in the tube field. This method brings undisputed advantages in terms of flexibility, production capability and cost reduction. This innovation enables the possibility to produce any size, included in the mill range, without roll change, resulting in extreme reduction in set up time.



Advantages of APL Apollo's DFT tubes

- **Direct material saving of 2% to 10%** depending upon specifications, size and thickness as compared to tubes manufactured by conventional technology.
- Physical and Theoretical weight of the tubes will be same, as per IS 4923.
- Corner radius are sharp, uniform and aesthetically looks good
- Odd sizes (any size can be rolled out subject to minimum order quantity)
- Short delivery period

Examples mentioned below are indicative only and demonstrate the percentage of material saved in hollow sections made from DFT method as compared to conventional method

SQUARE HOLLOW SECTION (SHS)

HxB mm	T mm	Material Savings %
60x60	2.0	3%
	2.9	5%
	3.0	7%
100x100	2.0	2%
	4.0	4%
	6.0	5%
300x300	8.0	4.0
	10.0	4.0
	12.0	4.0

RECTANGULAR HOLLOW SECTION (RHS)

HxB mm	T mm	Material Savings %
100x50	2.0	3%
	4.0	5%
	6.0	10%
200x100	2.9	3%
	3.6	4%
	5.0	5%
400x200	8.0	4%
	10.0	4%
	12.0	4%

GRADES

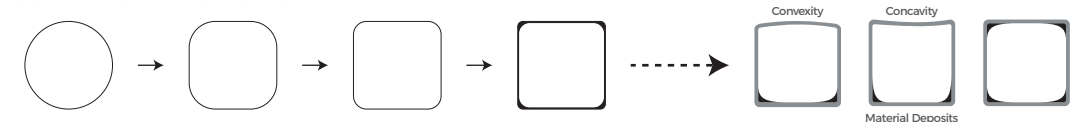
Grade(YST)
210 Mpa
240 Mpa
310 Mpa
355 Mpa

LENGTH

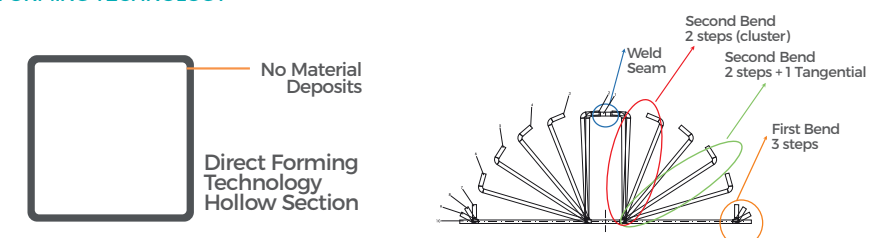
Length	Meter
Standard	6
Special*	5-12

*made on order

CONVENTIONAL TECHNOLOGY



DIRECT FORMING TECHNOLOGY



SQUARE HOLLOW SECTION

Product Range
12mm X 12mm to 300mm X 300mm

Thickness
1mm to 12mm



SQUARE HOLLOW SECTION (SHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx} cm ⁴	I _{yy} cm ⁴	R _{xx} cm	R _{yy} cm	Z _{xx} cm ³	Z _{yy} cm ³	S _{xx} cm ³	S _{yy} cm ³	J cm ⁴	C cm ³
12X12X1.6	0.47	0.60	0.10	0.10	0.41	0.41	0.17	0.17	0.22	0.22	0.12	0.18
12X12X2.0	0.55	0.70	0.11	0.11	0.40	0.40	0.19	0.19	0.25	0.25	0.07	0.13
15X15X1.6	0.62	0.79	0.23	0.23	0.54	0.54	0.31	0.31	0.39	0.39	0.32	0.38
15X15X2.0	0.74	0.94	0.25	0.25	0.52	0.52	0.34	0.34	0.44	0.44	0.28	0.35
15X15X2.2	0.79	1.00	0.25	0.25	0.50	0.50	0.34	0.34	0.46	0.46	0.24	0.32
20X20X1.6	0.87	1.11	0.61	0.61	0.74	0.74	0.61	0.61	0.75	0.75	0.95	0.84
20X20X2.0	1.05	1.34	0.69	0.69	0.72	0.72	0.69	0.69	0.88	0.88	1.01	0.90
20X20X2.2	1.13	1.44	0.73	0.73	0.71	0.71	0.73	0.73	0.93	0.93	1.00	0.90
20X20X2.6	1.29	1.64	0.78	0.78	0.69	0.69	0.78	0.78	1.02	1.02	0.92	0.85
25X25X1.6	1.12	1.43	1.28	1.28	0.95	0.95	1.03	1.03	1.24	1.24	2.05	1.46
25X25X2.0	1.37	1.74	1.48	1.48	0.92	0.92	1.19	1.19	1.47	1.47	2.32	1.64
25X25X2.2	1.48	1.88	1.57	1.57	0.91	0.91	1.26	1.26	1.57	1.57	2.40	1.70
25X25X2.6	1.70	2.16	1.72	1.72	0.89	0.89	1.38	1.38	1.76	1.76	2.47	1.76
25X25X2.9	1.84	2.35	1.81	1.81	0.88	0.88	1.45	1.45	1.88	1.88	2.41	1.75
30X30X1.6	1.37	1.75	2.31	2.31	1.15	1.15	1.54	1.54	1.84	1.84	3.73	2.24
30X30X2.0	1.68	2.14	2.72	2.72	1.13	1.13	1.82	1.82	2.21	2.21	4.35	2.59
30X30X2.2	1.82	2.32	2.91	2.91	1.12	1.12	1.94	1.94	2.37	2.37	4.60	2.72
30X30X2.6	2.10	2.68	3.23	3.23	1.10	1.10	2.16	2.16	2.68	2.68	4.96	2.93
30X30X2.9	2.30	2.93	3.44	3.44	1.08	1.08	2.30	2.30	2.89	2.89	5.09	3.02
30X30X3.0	2.36	3.01	3.50	3.50	1.08	1.08	2.34	2.34	2.96	2.96	5.11	3.03
30X30X3.2	2.49	3.17	3.62	3.62	1.07	1.07	2.42	2.42	3.08	3.08	5.10	3.05
30X30X4.0	2.94	3.75	3.97	3.97	1.03	1.03	2.65	2.65	3.50	3.50	4.52	2.84
30X30X5.0	3.42	4.36	4.16	4.16	0.98	0.98	2.78	2.78	3.84	3.84	2.69	1.98
30X30X6.0	3.79	4.83	4.12	4.12	0.92	0.92	2.75	2.75	4.01	4.01	0.69	0.76
32X32X1.6	1.48	1.88	2.84	2.84	1.23	1.23	1.78	1.78	2.12	2.12	4.59	2.60
32X32X2.0	1.81	2.30	3.36	3.36	1.21	1.21	2.10	2.10	2.54	2.54	5.40	3.02
32X32X2.2	1.96	2.50	3.60	3.60	1.20	1.20	2.25	2.25	2.74	2.74	5.74	3.19
32X32X2.6	2.26	2.88	4.02	4.02	1.18	1.18	2.52	2.52	3.11	3.11	6.26	3.47
32X32X2.9	2.48	3.16	4.30	4.30	1.17	1.17	2.69	2.69	3.36	3.36	6.51	3.60
32X32X3.2	2.68	3.42	4.54	4.54	1.15	1.15	2.84	2.84	3.59	3.59	6.62	3.68
38X38X1.6	1.77	2.26	4.92	4.92	1.48	1.48	2.59	2.59	3.06	3.06	7.93	3.82
38X38X2.0	2.18	2.78	5.88	5.88	1.45	1.45	3.10	3.10	3.70	3.70	9.49	4.51
38X38X2.2	2.38	3.03	6.32	6.32	1.44	1.44	3.33	3.33	4.00	4.00	10.19	4.81
38X38X2.6	2.76	3.51	7.14	7.14	1.43	1.43	3.76	3.76	4.57	4.57	11.39	5.33
38X38X2.9	3.03	3.86	7.68	7.68	1.41	1.41	4.05	4.05	4.97	4.97	12.10	5.65
38X38X3.2	3.29	4.19	8.18	8.18	1.40	1.40	4.31	4.31	5.34	5.34	12.64	5.89
38X38X3.6	3.63	4.62	8.76	8.76	1.38	1.38	4.62	4.62	5.80	5.80	13.07	6.10
40X40X1.6	1.88	2.39	5.79	5.79	1.56	1.56	2.90	2.90	3.41	3.41	9.32	4.28
40X40X2.0	2.31	2.94	6.94	6.94	1.54	1.54	3.47	3.47	4.13	4.13	11.20	5.07
40X40X2.2	2.51	3.20	7.47	7.47	1.53	1.53	3.74	3.74	4.48	4.48	12.05	5.42
40X40X2.6	2.92	3.72	8.45	8.45	1.51	1.51	4.23	4.23	5.12	5.12	13.54	6.04
40X40X2.9	3.21	4.09	9.11	9.11	1.49	1.49	4.56	4.56	5.58	5.58	14.46	6.42

SQUARE HOLLOW SECTION (SHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
40X40X3.0	3.30	4.21	9.32	9.32	1.49	1.49	4.66	4.66	5.72	5.72	14.72	6.53
40X40X3.2	3.49	4.45	9.72	9.72	1.48	1.48	4.86	4.86	6.01	6.01	15.19	6.73
40X40X3.6	3.85	4.91	10.45	10.45	1.46	1.46	5.23	5.23	6.53	6.53	15.86	7.02
40X40X4.0	4.20	5.35	11.07	11.07	1.44	1.44	5.54	5.54	7.01	7.01	16.15	7.19
40X40X5.0	4.99	6.36	12.26	12.26	1.39	1.39	6.13	6.13	8.02	8.02	15.15	6.99
40X40X6.0	5.68	7.23	12.94	12.94	1.34	1.34	6.47	6.47	8.76	8.76	11.76	5.89
40X40X8.0	6.74	8.59	13.03	13.03	1.23	1.23	6.52	6.52	9.50	9.50	2.17	1.81
45X45X1.6	2.13	2.71	8.41	8.41	1.76	1.76	3.74	3.74	4.38	4.38	13.47	5.54
45X45X2.0	2.62	3.34	10.12	10.12	1.74	1.74	4.50	4.50	5.32	5.32	16.31	6.61
45X45X2.2	2.86	3.64	10.92	10.92	1.73	1.73	4.86	4.86	5.78	5.78	17.63	7.10
45X45X2.6	3.33	4.24	12.42	12.42	1.71	1.71	5.52	5.52	6.64	6.64	20.01	7.98
45X45X2.9	3.67	4.67	13.45	13.45	1.70	1.70	5.98	5.98	7.25	7.25	21.57	8.55
45X45X3.2	4.00	5.09	14.41	14.41	1.68	1.68	6.41	6.41	7.83	7.83	22.91	9.05
45X45X3.6	4.42	5.63	15.57	15.57	1.66	1.66	6.92	6.92	8.55	8.55	24.33	9.58
45X45X4.0	4.83	6.15	16.61	16.61	1.64	1.64	7.39	7.39	9.22	9.22	25.31	9.96
50X50X1.6	2.38	3.03	11.71	11.71	1.97	1.97	4.69	4.69	5.46	5.46	18.68	6.95
50X50X2.0	2.94	3.74	14.15	14.15	1.95	1.95	5.66	5.66	6.66	6.66	22.75	8.35
50X50X2.2	3.20	4.08	15.30	15.30	1.94	1.94	6.12	6.12	7.24	7.24	24.66	9.00
50X50X2.6	3.74	4.76	17.47	17.47	1.92	1.92	6.99	6.99	8.34	8.34	28.19	10.18
50X50X2.9	4.12	5.25	18.98	18.98	1.90	1.90	7.60	7.60	9.13	9.13	30.58	10.98
50X50X3.0	4.25	5.41	19.47	19.47	1.90	1.90	7.79	7.79	9.39	9.39	31.33	11.22
50X50X3.2	4.50	5.73	20.40	20.40	1.89	1.89	8.16	8.16	9.89	9.89	32.72	11.68
50X50X3.6	4.98	6.35	22.15	22.15	1.87	1.87	8.86	8.86	10.84	10.84	35.16	12.49
50X50X4.0	5.46	6.95	23.74	23.74	1.85	1.85	9.50	9.50	11.73	11.73	37.09	13.14
50X50X4.5	6.02	7.67	25.50	25.50	1.82	1.82	10.20	10.20	12.76	12.76	38.72	13.72
50X50X5.0	6.56	8.36	27.04	27.04	1.80	1.80	10.82	10.82	13.70	13.70	39.43	14.04
50X50X6.0	7.56	9.63	29.45	29.45	1.75	1.75	11.78	11.78	15.32	15.32	37.97	13.86
50X50X8.0	9.26	11.79	31.94	31.94	1.65	1.65	12.78	12.78	17.55	17.55	24.10	10.19
60X60X2.0	3.56	4.54	25.14	25.14	2.35	2.35	8.38	8.38	9.79	9.79	40.19	12.44
60X60X2.2	3.89	4.96	27.27	27.27	2.34	2.34	9.09	9.09	10.66	10.66	43.74	13.46
60X60X2.6	4.55	5.80	31.33	31.33	2.32	2.32	10.45	10.45	12.34	12.34	50.48	15.37
60X60X2.9	5.03	6.41	34.21	34.21	2.31	2.31	11.41	11.41	13.56	13.56	55.20	16.69
60X60X3.0	5.19	6.61	35.13	35.13	2.31	2.31	11.71	11.71	13.95	13.95	56.70	17.11
60X60X3.2	5.50	7.01	36.94	36.94	2.30	2.30	12.32	12.32	14.73	14.73	59.61	17.92
60X60X3.6	6.12	7.79	40.37	40.37	2.28	2.28	13.46	13.46	16.22	16.22	64.96	19.39
60X60X4.0	6.71	8.55	43.55	43.55	2.26	2.26	14.52	14.52	17.64	17.64	69.66	20.68
60X60X4.5	7.43	9.47	47.20	47.20	2.23	2.23	15.74	15.74	19.32	19.32	74.54	22.04
60X60X5.0	8.13	10.36	50.49	50.49	2.21	2.21	16.83	16.83	20.88	20.88	78.24	23.09
60X60X6.0	9.44	12.03	56.07	56.07	2.16	2.16	18.69	18.69	23.68	23.68	81.77	24.26
60X60X8.0	11.77	14.99	63.48	63.48	2.06	2.06	21.16	21.16	28.01	28.01	72.24	22.68
72X72X2.0	4.32	5.50	44.46	44.46	2.84	2.84	12.35	12.35	14.34	14.34	70.60	18.39
72X72X2.2	4.73	6.02	48.35	48.35	2.83	2.83	13.44	13.44	15.64	15.64	77.05	19.96

SQUARE HOLLOW SECTION (SHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
72X72X2.6	5.53	7.04	55.82	55.82	2.82	2.82	15.51	15.51	18.17	18.17	89.49	22.96
72X72X2.9	6.12	7.80	61.18	61.18	2.80	2.80	17.00	17.00	20.01	20.01	98.39	25.08
72X72X3.2	6.70	8.54	66.32	66.32	2.79	2.79	18.43	18.43	21.80	21.80	106.90	27.08
72X72X3.6	7.47	9.52	72.86	72.86	2.77	2.77	20.24	20.24	24.11	24.11	117.58	29.57
72X72X4.0	8.22	10.47	79.03	79.03	2.75	2.75	21.96	21.96	26.32	26.32	127.44	31.84
72X72X4.5	9.13	11.63	86.24	86.24	2.72	2.72	23.96	23.96	28.97	28.97	138.51	34.38
72X72X5.0	10.02	12.76	92.91	92.91	2.70	2.70	25.81	25.81	31.47	31.47	148.08	36.58
72X72X6.0	11.70	14.91	104.71	104.71	2.65	2.65	29.09	29.09	36.08	36.08	162.23	39.90
72X72X8.0	14.78	18.83	122.48	122.48	2.55	2.55	34.03	34.03	43.72	43.72	168.14	42.04
75X75X2.0	4.51	5.74	50.49	50.49	2.97	2.97	13.47	13.47	15.61	15.61	80.04	20.06
75X75X2.2	4.93	6.28	54.93	54.93	2.96	2.96	14.65	14.65	17.03	17.03	87.39	21.79
75X75X2.6	5.78	7.36	63.48	63.48	2.94	2.94	16.93	16.93	19.81	19.81	101.62	25.09
75X75X2.9	6.40	8.15	69.62	69.62	2.92	2.92	18.57	18.57	21.82	21.82	111.84	27.44
75X75X3.0	6.60	8.41	71.62	71.62	2.92	2.92	19.10	19.10	22.49	22.49	115.16	28.19
75X75X3.2	7.01	8.93	75.53	75.53	2.91	2.91	20.15	20.15	23.79	23.79	121.65	29.66
75X75X3.6	7.81	9.95	83.06	83.06	2.89	2.89	22.15	22.15	26.32	26.32	134.02	32.44
75X75X4.0	8.60	10.95	90.19	90.19	2.87	2.87	24.06	24.06	28.76	28.76	145.52	34.99
75X75X4.5	9.55	12.17	98.55	98.55	2.85	2.85	26.28	26.28	31.68	31.68	158.59	37.87
75X75X5.0	10.49	13.36	106.33	106.33	2.82	2.82	28.36	28.36	34.46	34.46	170.06	40.40
75X75X6.0	12.27	15.63	120.16	120.16	2.77	2.77	32.05	32.05	39.58	39.58	187.76	44.34
80X80X2.0	4.82	6.14	61.70	61.70	3.17	3.17	15.43	15.43	17.85	17.85	97.58	23.00
80X80X2.2	5.28	6.72	67.17	67.17	3.16	3.16	16.80	16.80	19.49	19.49	106.61	25.01
80X80X2.6	6.19	7.88	77.75	77.75	3.14	3.14	19.44	19.44	22.68	22.68	124.17	28.86
80X80X2.9	6.85	8.73	85.36	85.36	3.13	3.13	21.34	21.34	25.02	25.02	136.85	31.60
80X80X3.2	7.51	9.57	92.71	92.71	3.11	3.11	23.18	23.18	27.29	27.29	149.08	34.21
80X80X3.6	8.38	10.67	102.11	102.11	3.09	3.09	25.53	25.53	30.23	30.23	164.62	37.50
80X80X4.0	9.22	11.75	111.04	111.04	3.07	3.07	27.76	27.76	33.07	33.07	179.21	40.56
80X80X4.5	10.26	13.07	121.58	121.58	3.05	3.05	30.40	30.40	36.48	36.48	196.03	44.05
80X80X5.0	11.27	14.36	131.44	131.44	3.03	3.03	32.86	32.86	39.74	39.74	211.11	47.16
80X80X6.0	13.21	16.83	149.18	149.18	2.98	2.98	37.30	37.30	45.79	45.79	235.58	52.23
91.5X91.5X2.0	5.54	7.06	93.52	93.52	3.64	3.64	20.45	20.45	23.57	23.57	147.16	30.52
91.5X91.5X2.2	6.07	7.73	101.95	101.95	3.63	3.63	22.29	22.29	25.76	25.76	160.99	33.24
91.5X91.5X2.6	7.12	9.07	118.32	118.32	3.61	3.61	25.87	25.87	30.04	30.04	188.04	38.49
91.5X91.5X2.9	7.90	10.06	130.18	130.18	3.60	3.60	28.46	28.46	33.18	33.18	207.73	42.27
91.5X91.5X3.2	8.67	11.04	141.69	141.69	3.58	3.58	30.98	30.98	36.25	36.25	226.89	45.90
91.5X91.5X3.6	9.67	12.32	156.49	156.49	3.56	3.56	34.21	34.21	40.24	40.24	251.52	50.52
91.5X91.5X4.0	10.67	13.59	170.68	170.68	3.54	3.54	37.31	37.31	44.12	44.12	275.03	54.88
91.5X91.5X4.5	11.88	15.14	187.57	187.57	3.52	3.52	41.00	41.00	48.79	48.79	302.71	59.96
91.5X91.5X5.0	13.08	16.66	203.55	203.55	3.50	3.50	44.50	44.50	53.29	53.29	328.34	64.62
91.5X91.5X6.0	15.38	19.59	232.81	232.81	3.45	3.45	50.89	50.89	61.76	61.76	372.82	72.65
100X100X2.0	6.08	7.74	123.01	123.01	3.99	3.99	24.61	24.61	28.30	28.30	192.95	36.76
100X100X2.2	6.66	8.48	134.20	134.20	3.98	3.98	26.84	26.84	30.95	30.95	211.23	40.07

SQUARE HOLLOW SECTION (SHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
100X100X2.6	7.82	9.96	156.01	156.01	3.96	3.96	31.21	31.21	36.15	36.15	247.10	46.50
100X100X2.9	8.67	11.05	171.86	171.86	3.94	3.94	34.38	34.38	39.95	39.95	273.33	51.14
100X100X3.0	8.96	11.41	177.05	177.05	3.94	3.94	35.41	35.41	41.21	41.21	281.94	52.65
100X100X3.2	9.52	12.13	187.28	187.28	3.93	3.93	37.46	37.46	43.69	43.69	298.95	55.63
100X100X3.6	10.64	13.55	207.19	207.19	3.91	3.91	41.44	41.44	48.56	48.56	332.08	61.37
100X100X4.0	11.74	14.95	226.35	226.35	3.89	3.89	45.27	45.27	53.30	53.30	363.96	66.82
100X100X4.5	13.09	16.67	249.29	249.29	3.87	3.87	49.86	49.86	59.04	59.04	401.89	73.25
100X100X5.0	14.41	18.36	271.10	271.10	3.84	3.84	54.22	54.22	64.59	64.59	437.53	79.22
100X100X6.0	16.98	21.63	311.47	311.47	3.79	3.79	62.30	62.30	75.10	75.10	501.21	89.77
100X100X8.0	21.82	27.79	379.77	379.77	3.70	3.70	75.96	75.96	93.83	93.83	593.41	105.11
110X110X2.6	8.64	11.00	209.69	209.69	4.37	4.37	38.13	38.13	44.05	44.05	330.92	56.88
110X110X2.9	9.58	12.21	231.26	231.26	4.35	4.35	42.05	42.05	48.73	48.73	366.47	62.65
110X110X3.2	10.53	13.41	252.31	252.31	4.34	4.34	45.88	45.88	53.33	53.33	401.33	68.25
110X110X3.6	11.77	14.99	279.58	279.58	4.32	4.32	50.84	50.84	59.34	59.34	446.64	75.46
110X110X4.0	12.99	16.55	305.94	305.94	4.30	4.30	55.63	55.63	65.21	65.21	490.52	82.35
110X110X4.5	14.50	18.47	337.63	337.63	4.28	4.28	61.39	61.39	72.35	72.35	543.21	90.54
110X110X5.0	15.98	20.36	367.95	367.95	4.25	4.25	66.90	66.90	79.27	79.27	593.30	98.24
110X110X6.0	18.86	24.03	424.57	424.57	4.20	4.20	77.20	77.20	92.46	92.46	684.89	112.13
110X110X8.0	24.33	30.99	522.39	522.39	4.11	4.11	94.98	94.98	116.29	116.29	828.32	133.69
120X120X2.6	9.45	12.04	274.44	274.44	4.77	4.77	45.74	45.74	52.73	52.73	431.73	68.30
120X120X2.9	10.50	13.37	302.98	302.98	4.76	4.76	50.50	50.50	58.37	58.37	478.54	75.32
120X120X3.2	11.53	14.69	330.88	330.88	4.75	4.75	55.15	55.15	63.93	63.93	524.57	82.16
120X120X3.6	12.90	16.43	367.12	367.12	4.73	4.73	61.19	61.19	71.21	71.21	584.63	90.98
120X120X4.0	14.25	18.15	402.28	402.28	4.71	4.71	67.05	67.05	78.33	78.33	643.08	99.48
120X120X4.5	15.91	20.27	444.70	444.70	4.68	4.68	74.12	74.12	87.01	87.01	713.71	109.63
120X120X5.0	17.55	22.36	485.47	485.47	4.66	4.66	80.92	80.92	95.45	95.45	781.43	119.26
120X120X6.0	20.75	26.43	562.16	562.16	4.61	4.61	93.70	93.70	111.61	111.61	907.27	136.89
120X120X8.0	26.84	34.19	696.82	696.82	4.51	4.51	116.14	116.14	141.14	141.14	1114.50	165.47
125X125X2.6	9.86	12.56	311.30	311.30	4.98	4.98	49.81	49.81	57.36	57.36	488.99	74.40
125X125X2.9	10.95	13.95	343.81	343.81	4.96	4.96	55.01	55.01	63.52	63.52	542.22	82.09
125X125X3.2	12.03	15.33	375.64	375.64	4.95	4.95	60.11	60.11	69.59	69.59	594.61	89.59
125X125X3.6	13.46	17.15	417.03	417.03	4.93	4.93	66.73	66.73	77.54	77.54	663.08	99.29
125X125X4.0	14.88	18.95	457.23	457.23	4.91	4.91	73.16	73.16	85.33	85.33	729.85	108.65
125X125X4.5	16.62	21.17	505.83	505.83	4.89	4.89	80.94	80.94	94.84	94.84	810.75	119.85
125X125X5.0	18.34	23.36	552.62	552.62	4.86	4.86	88.42	88.42	104.10	104.10	888.58	130.52
125X125X6.0	21.69	27.63	640.89	640.89	4.82	4.82	102.55	102.55	121.87	121.87	1034.09	150.16
125X125X8.0	28.10	35.79	796.96	796.96	4.72	4.72	127.52	127.52	154.47	154.47	1278.30	182.55
140X140X2.9	12.32	15.69	487.99	487.99	5.58	5.58	69.72	69.72	80.27	80.27	766.42	104.14
140X140X3.2	13.54	17.25	533.76	533.76	5.56	5.56	76.26	76.26	88.01	88.01	841.30	113.80
140X140X3.6	15.16	19.31	593.44	593.44	5.54	5.54	84.78	84.78	98.18	98.18	939.53	126.36
140X140X4.0	16.76	21.35	651.62	651.62	5.52	5.52	93.09	93.09	108.15	108.15	1035.76	138.54
140X140X4.5	18.74	23.87	722.24	722.24	5.50	5.50	103.18	103.18	120.37	120.37	1153.06	153.21

SQUARE HOLLOW SECTION (SHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
140X140X5.0	20.69	26.36	790.56	790.56	5.48	5.48	112.94	112.94	132.30	132.30	1266.79	167.29
140X140X6.0	24.52	31.23	920.43	920.43	5.43	5.43	131.49	131.49	155.33	155.33	1482.50	193.59
140X140X8.0	31.86	40.59	1153.92	1153.92	5.33	5.33	164.85	164.85	198.05	198.05	1859.75	238.59
150X150X2.9	13.23	16.85	603.62	603.62	5.99	5.99	80.49	80.49	92.53	92.53	945.70	120.29
150X150X3.2	14.55	18.53	660.62	660.62	5.97	5.97	88.09	88.09	101.50	101.50	1038.64	131.55
150X150X3.6	16.29	20.75	735.09	735.09	5.95	5.95	98.02	98.02	113.28	113.28	1160.76	146.21
150X150X4.0	18.02	22.95	807.82	807.82	5.93	5.93	107.71	107.71	124.87	124.87	1280.69	160.46
150X150X4.5	20.15	25.67	896.30	896.30	5.91	5.91	119.51	119.51	139.08	139.08	1427.31	177.70
150X150X5.0	22.26	28.36	982.12	982.12	5.88	5.88	130.95	130.95	152.98	152.98	1570.02	194.30
150X150X6.0	26.40	33.63	1145.91	1145.91	5.84	5.84	152.79	152.79	179.88	179.88	1842.55	225.53
150X150X8.0	34.38	43.79	1443.00	1443.00	5.74	5.74	192.40	192.40	230.11	230.11	2328.39	279.93
150X150X10.0	41.93	53.42	1701.21	1701.21	5.64	5.64	226.83	226.83	275.67	275.67	2720.95	323.18
175X175X4.0	21.16	26.95	1303.12	1303.12	6.95	6.95	148.93	148.93	171.90	171.90	2053.97	222.27
175X175X4.5	23.68	30.17	1448.83	1448.83	6.93	6.93	165.59	165.59	191.75	191.75	2293.76	246.80
175X175X5.0	26.19	33.36	1590.86	1590.86	6.91	6.91	181.82	181.82	211.24	211.24	2528.72	270.58
175X175X6.0	31.11	39.63	1864.03	1864.03	6.86	6.86	213.04	213.04	249.15	249.15	2982.78	315.88
175X175X8.0	40.66	51.79	2367.89	2367.89	6.76	6.76	270.62	270.62	320.75	320.75	3818.44	397.28
175X175X10.0	49.78	63.42	2817.20	2817.20	6.66	6.66	321.97	321.97	386.83	386.83	4540.40	465.99
180X180X4.0	21.78	27.75	1421.74	1421.74	7.16	7.16	157.98	157.98	182.21	182.21	2238.61	235.83
180X180X4.5	24.39	31.07	1581.26	1581.26	7.13	7.13	175.70	175.70	203.30	203.30	2500.75	261.96
180X180X5.0	26.97	34.36	1736.87	1736.87	7.11	7.11	192.99	192.99	224.02	224.02	2757.85	287.33
180X180X6.0	32.05	40.83	2036.52	2036.52	7.06	7.06	226.28	226.28	264.35	264.35	3255.59	335.75
180X180X8.0	41.91	53.39	2590.73	2590.73	6.97	6.97	287.86	287.86	340.68	340.68	4175.84	423.14
180X180X10.0	51.35	65.42	3086.93	3086.93	6.87	6.87	343.00	343.00	411.31	411.31	4978.18	497.54
200X200X4.0	24.30	30.95	1968.13	1968.13	7.97	7.97	196.82	196.82	226.44	226.44	3087.18	294.08
200X200X4.5	27.22	34.67	2191.54	2191.54	7.95	7.95	219.16	219.16	252.86	252.86	3452.29	327.13
200X200X5.0	30.11	38.36	2410.09	2410.09	7.93	7.93	241.01	241.01	278.87	278.87	3811.54	359.35
200X200X6.0	35.82	45.63	2832.75	2832.75	7.88	7.88	283.28	283.28	329.67	329.67	4511.01	421.22
200X200X8.0	46.94	59.79	3621.63	3621.63	7.78	7.78	362.17	362.17	426.39	426.39	5823.37	534.59
200X200X10.0	57.63	73.42	4337.63	4337.63	7.69	7.69	433.77	433.77	516.73	516.73	7000.54	633.74
200X200X12.0	67.93	86.53	4983.59	4983.59	7.59	7.59	498.36	498.36	600.81	600.81	8019.34	718.18
220X220X4.5	30.04	38.27	2941.55	2941.55	8.77	8.77	267.42	267.42	307.83	307.83	4617.74	399.50
220X220X5.0	33.25	42.36	3238.02	3238.02	8.74	8.74	294.37	294.37	339.73	339.73	5102.67	439.36
220X220X6.0	39.59	50.43	3813.36	3813.36	8.70	8.70	346.67	346.67	402.18	402.18	6050.76	516.29
220X220X8.0	51.96	66.19	4894.99	4894.99	8.60	8.60	445.00	445.00	521.70	521.70	7848.38	658.83
220X220X10.0	63.91	81.42	5887.19	5887.19	8.50	8.50	535.20	535.20	634.16	634.16	9492.81	785.91
220X220X12.0	75.46	96.13	6793.08	6793.08	8.41	8.41	617.56	617.56	739.66	739.66	10958.24	897.07
225X225X4.5	30.75	39.17	3152.57	3152.57	8.97	8.97	280.23	280.23	322.41	322.41	4945.06	418.72
225X225X5.0	34.04	43.36	3471.05	3471.05	8.95	8.95	308.54	308.54	355.88	355.88	5465.36	460.61
225X225X6.0	40.53	51.63	4089.57	4089.57	8.90	8.90	363.52	363.52	421.43	421.43	6483.49	541.55
225X225X8.0	53.22	67.79	5254.21	5254.21	8.80	8.80	467.05	467.05	547.03	547.03	8418.11	691.89
225X225X10.0	65.48	83.42	6325.02	6325.02	8.71	8.71	562.23	562.23	665.39	665.39	10194.92	826.45

■ UPCOMING SIZES

*Galvanised sections can also be manufactured | *Customised sections can also be manufactured.

RECTANGULAR HOLLOW SECTION

Product Range

26mm X 13mm to 400mm X 200mm

Thickness

1mm to 12mm



RECTANGULAR HOLLOW SECTION (RHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx} cm ⁴	I _{yy} cm ⁴	R _{xx} cm	R _{yy} cm	Z _{xx} cm ³	Z _{yy} cm ³	S _{xx} cm ³	S _{yy} cm ³	J cm ⁴	C cm ³
26X13X1.6	0.85	1.08	0.83	0.27	0.88	0.50	0.64	0.42	0.84	0.51	0.63	0.66
26X13X2.0	1.02	1.30	0.94	0.30	0.85	0.48	0.73	0.47	0.98	0.59	0.64	0.67
30X20X1.6	1.12	1.43	1.66	0.88	1.08	0.78	1.11	0.88	1.39	1.05	1.85	1.38
30X20X2.0	1.37	1.74	1.94	1.02	1.06	0.77	1.30	1.02	1.65	1.24	2.08	1.55
30X20X2.2	1.48	1.88	2.05	1.08	1.04	0.76	1.37	1.08	1.76	1.32	2.15	1.60
40X10X1.6	1.12	1.43	2.25	0.22	1.25	0.39	1.13	0.44	1.57	0.54	0.65	0.76
40X10X2.0	1.37	1.74	2.60	0.25	1.22	0.38	1.30	0.50	1.85	0.63	0.65	0.78
40X20X1.6	1.37	1.75	3.43	1.15	1.40	0.81	1.72	1.15	2.18	1.34	2.83	1.92
40X20X2.0	1.68	2.14	4.05	1.34	1.38	0.79	2.03	1.34	2.61	1.60	3.25	2.19
40X20X2.2	1.82	2.32	4.32	1.43	1.36	0.79	2.16	1.43	2.81	1.71	3.40	2.29
40X20X2.6	2.10	2.68	4.81	1.57	1.34	0.77	2.41	1.57	3.18	1.93	3.58	2.43
40X25X1.6	1.50	1.91	4.02	1.93	1.45	1.01	2.01	1.55	2.49	1.80	4.25	2.51
40X25X2.0	1.84	2.34	4.77	2.28	1.43	0.99	2.39	1.83	2.99	2.16	4.99	2.91
40X25X2.2	1.99	2.54	5.11	2.43	1.42	0.98	2.56	1.95	3.23	2.32	5.28	3.07
40X25X2.6	2.31	2.94	5.72	2.71	1.39	0.96	2.86	2.17	3.67	2.63	5.73	3.32
50X25X1.6	1.75	2.23	7.02	2.37	1.77	1.03	2.81	1.90	3.53	2.17	5.83	3.21
50X25X2.0	2.15	2.74	8.38	2.81	1.75	1.01	3.36	2.25	4.26	2.62	6.90	3.76
50X25X2.2	2.34	2.98	9.01	3.01	1.74	1.01	3.61	2.41	4.61	2.82	7.35	3.99
50X25X2.6	2.72	3.46	10.16	3.36	1.71	0.99	4.07	2.69	5.26	3.21	8.09	4.37
50X30X1.6	1.88	2.39	7.96	3.60	1.82	1.23	3.19	2.40	3.91	2.75	8.07	3.96
50X30X2.0	2.31	2.94	9.54	4.29	1.80	1.21	3.82	2.86	4.74	3.33	9.65	4.67
50X30X2.2	2.51	3.20	10.27	4.61	1.79	1.20	4.11	3.08	5.14	3.60	10.35	4.99
50X30X2.6	2.92	3.72	11.62	5.19	1.77	1.18	4.65	3.46	5.88	4.11	11.56	5.53
50X30X2.9	3.21	4.09	12.54	5.58	1.75	1.17	5.02	3.72	6.40	4.47	12.27	5.85
60X40X1.6	2.38	3.03	15.22	8.16	2.24	1.64	5.08	4.08	6.12	4.64	17.10	6.63
60X40X2.0	2.94	3.74	18.41	9.83	2.22	1.62	6.14	4.92	7.47	5.65	20.77	7.96
60X40X2.2	3.20	4.08	19.92	10.62	2.21	1.61	6.64	5.31	8.12	6.14	22.49	8.56
60X40X2.6	3.74	4.76	22.76	12.09	2.19	1.59	7.59	6.05	9.36	7.07	25.65	9.67
60X40X2.9	4.12	5.25	24.74	13.11	2.17	1.58	8.25	6.56	10.25	7.73	27.76	10.41
60X40X3.0	4.25	5.41	25.38	13.44	2.17	1.58	8.46	6.72	10.53	7.94	28.41	10.63
60X40X3.2	4.50	5.73	26.61	14.07	2.15	1.57	8.87	7.04	11.09	8.36	29.63	11.05
60X40X3.6	4.98	6.35	28.90	15.23	2.13	1.55	9.64	7.62	12.16	9.15	31.72	11.79
66X33X1.6	2.36	3.00	16.85	5.74	2.37	1.38	5.11	3.48	6.34	3.92	14.01	5.94
66X33X2.0	2.90	3.70	20.37	6.90	2.35	1.37	6.18	4.19	7.73	4.77	16.94	7.09
66X33X2.2	3.17	4.04	22.03	7.43	2.34	1.36	6.68	4.51	8.40	5.17	18.28	7.61
66X33X2.6	3.69	4.70	25.15	8.43	2.31	1.34	7.63	5.11	9.68	5.94	20.72	8.56
66X33X2.9	4.07	5.19	27.33	9.12	2.29	1.33	8.29	5.53	10.59	6.49	22.31	9.17
66X33X3.2	4.44	5.66	29.37	9.75	2.28	1.31	8.90	5.91	11.46	7.01	23.67	9.70
75X25X1.6	2.38	3.03	19.74	3.47	2.55	1.07	5.27	2.78	6.81	3.11	9.94	4.97
75X25X2.0	2.94	3.74	23.84	4.14	2.52	1.05	6.36	3.32	8.31	3.77	11.88	5.88
75X25X2.2	3.20	4.08	25.77	4.44	2.51	1.04	6.88	3.56	9.02	4.08	12.75	6.28
75X25X2.6	3.74	4.76	29.40	5.00	2.49	1.02	7.84	4.00	10.40	4.67	14.26	6.99

RECTANGULAR HOLLOW SECTION (RHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
75X25X3.0	4.25	5.41	32.72	5.49	2.46	1.01	8.73	4.40	11.69	5.21	15.44	7.55
75X50X1.6	3.01	3.83	30.51	16.39	2.82	2.07	8.14	6.56	9.75	7.40	34.07	10.70
75X50X2.0	3.72	4.74	37.16	19.91	2.80	2.05	9.91	7.97	11.96	9.06	41.75	12.96
75X50X2.2	4.07	5.18	40.35	21.59	2.79	2.04	10.76	8.64	13.03	9.87	45.43	14.02
75X50X2.6	4.76	6.06	46.44	24.78	2.77	2.02	12.39	9.92	15.10	11.43	52.42	16.02
75X50X2.9	5.26	6.70	50.77	27.04	2.75	2.01	13.54	10.82	16.60	12.55	57.31	17.40
75X50X3.2	5.75	7.33	54.90	29.18	2.74	2.00	14.64	11.68	18.04	13.63	61.88	18.69
75X50X3.6	6.40	8.15	60.10	31.86	2.72	1.98	16.03	12.75	19.90	15.01	67.44	20.23
75X50X4.0	7.03	8.95	64.96	34.34	2.69	1.96	17.33	13.74	21.66	16.33	72.33	21.59
80X40X1.6	2.88	3.67	30.71	10.52	2.89	1.69	7.68	5.26	9.47	5.87	25.48	8.99
80X40X2.0	3.56	4.54	37.36	12.72	2.87	1.67	9.34	6.36	11.61	7.17	31.08	10.84
80X40X2.2	3.89	4.96	40.53	13.76	2.86	1.67	10.14	6.88	12.64	7.80	33.72	11.71
80X40X2.6	4.55	5.80	46.58	15.74	2.83	1.65	11.65	7.87	14.64	9.01	38.68	13.31
80X40X2.9	5.03	6.41	50.87	17.11	2.82	1.63	12.72	8.56	16.07	9.88	42.09	14.40
80X40X3.0	5.19	6.61	52.25	17.56	2.81	1.63	13.07	8.78	16.54	10.16	43.16	14.74
80X40X3.2	5.50	7.01	54.94	18.41	2.80	1.62	13.74	9.21	17.46	10.72	45.21	15.39
80X40X3.6	6.12	7.79	60.05	20.02	2.78	1.60	15.02	10.01	19.23	11.77	48.88	16.56
80X40X4.0	6.71	8.55	64.79	21.49	2.75	1.59	16.20	10.75	20.91	12.77	51.97	17.55
96X48X1.6	3.49	4.44	54.03	18.57	3.49	2.05	11.26	7.74	13.82	8.58	44.69	13.26
96X48X2.0	4.32	5.50	66.04	22.59	3.47	2.03	13.76	9.42	17.00	10.52	54.83	16.09
96X48X2.2	4.73	6.02	71.82	24.51	3.45	2.02	14.97	10.22	18.54	11.47	59.70	17.44
96X48X2.6	5.53	7.04	82.96	28.19	3.43	2.00	17.29	11.75	21.55	13.30	69.03	19.99
96X48X2.9	6.12	7.80	90.94	30.79	3.41	1.99	18.95	12.83	23.73	14.63	75.62	21.77
96X48X3.2	6.70	8.54	98.61	33.28	3.40	1.97	20.55	13.87	25.85	15.91	81.83	23.43
96X48X3.6	7.47	9.52	108.35	36.40	3.37	1.96	22.58	15.17	28.58	17.56	89.50	25.47
96X48X4.0	8.22	10.47	117.54	39.32	3.35	1.94	24.49	16.39	31.21	19.14	96.41	27.30
96X48X4.5	9.13	11.63	128.30	42.68	3.32	1.92	26.73	17.79	34.34	21.01	103.91	29.30
100X50X1.6	3.63	4.63	61.29	21.08	3.64	2.13	12.26	8.44	15.04	9.33	50.65	14.45
100X50X2.0	4.51	5.74	74.98	25.67	3.61	2.11	15.00	10.27	18.50	11.46	62.21	17.57
100X50X2.2	4.93	6.28	81.59	27.87	3.60	2.11	16.32	11.15	20.19	12.50	67.79	19.05
100X50X2.6	5.78	7.36	94.33	32.09	3.58	2.09	18.87	12.84	23.48	14.51	78.48	21.86
100X50X2.9	6.40	8.15	103.48	35.09	3.56	2.07	20.70	14.04	25.88	15.96	86.08	23.84
100X50X3.0	6.60	8.41	106.46	36.06	3.56	2.07	21.30	14.43	26.66	16.44	88.53	24.47
100X50X3.2	7.01	8.93	112.29	37.95	3.55	2.06	22.46	15.18	28.20	17.37	93.28	25.70
100X50X3.6	7.81	9.95	123.51	41.56	3.52	2.04	24.71	16.63	31.21	19.19	102.23	27.99
100X50X4.0	8.60	10.95	134.14	44.95	3.50	2.03	26.83	17.98	34.10	20.93	110.37	30.06
100X50X4.5	9.55	12.17	146.61	48.87	3.47	2.00	29.33	19.55	37.56	23.00	119.34	32.35
100X50X5.0	10.49	13.36	158.19	52.45	3.44	1.98	31.64	20.98	40.84	24.95	126.87	34.28
120X60X1.6	4.39	5.59	107.43	37.05	4.38	2.57	17.91	12.35	21.89	13.60	88.45	21.18
120X60X2.0	5.45	6.94	131.92	45.33	4.36	2.56	21.99	15.11	27.00	16.75	109.10	25.89
120X60X2.2	5.97	7.60	143.82	49.33	4.35	2.55	23.97	16.45	29.51	18.29	119.15	28.15
120X60X2.6	7.00	8.92	166.92	57.05	4.33	2.53	27.82	19.02	34.41	21.30	138.66	32.50

RECTANGULAR HOLLOW SECTION (RHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
120X60X2.9	7.76	9.89	183.65	62.60	4.31	2.52	30.61	20.87	38.00	23.49	152.74	35.60
120X60X3.2	8.52	10.85	199.88	67.95	4.29	2.50	33.32	22.65	41.51	25.63	166.31	38.56
120X60X3.6	9.51	12.11	220.75	74.77	4.27	2.48	36.80	24.93	46.07	28.40	183.57	42.29
120X60X4.0	10.48	13.35	240.74	81.25	4.25	2.47	40.13	27.09	50.49	31.08	199.79	45.76
120X60X4.5	11.67	14.87	264.52	88.88	4.22	2.44	44.09	29.63	55.82	34.30	218.51	49.75
120X60X5.0	12.84	16.36	286.97	95.99	4.19	2.42	47.83	32.00	60.95	37.38	235.39	53.33
120X60X6.0	15.10	19.23	328.01	108.77	4.13	2.38	54.67	36.26	70.57	43.12	263.07	59.24
150X25X1.6	4.26	5.43	124.73	6.76	4.79	1.12	16.64	5.41	22.68	5.92	22.78	10.23
150X25X2.0	5.29	6.74	152.77	8.11	4.76	1.10	20.37	6.49	27.95	7.22	27.42	12.24
150X25X2.2	5.79	7.38	166.32	8.74	4.75	1.09	22.18	7.00	30.52	7.84	29.56	13.16
150X25X2.6	6.80	8.66	192.52	9.91	4.71	1.07	25.67	7.93	35.54	9.04	33.47	14.85
150X50X1.6	4.89	6.23	168.78	30.45	5.20	2.21	22.51	12.18	28.62	13.21	85.50	21.95
150X50X2.0	6.08	7.74	207.53	37.20	5.18	2.19	27.68	14.88	35.35	16.26	105.19	26.79
150X50X2.2	6.66	8.48	226.40	40.45	5.17	2.18	30.19	16.18	38.65	17.75	114.73	29.11
150X50X2.6	7.82	9.96	263.14	46.71	5.14	2.17	35.09	18.69	45.12	20.67	133.18	33.55
150X50X2.9	8.67	11.05	289.82	51.19	5.12	2.15	38.65	20.48	49.87	22.79	146.42	36.72
150X50X3.0	8.96	11.41	298.55	52.65	5.12	2.15	39.81	21.06	51.43	23.49	150.71	37.74
150X50X3.2	9.52	12.13	315.76	55.50	5.10	2.14	42.11	22.20	54.52	24.86	159.12	39.73
150X50X3.6	10.64	13.55	349.22	60.98	5.08	2.12	46.57	24.40	60.58	27.54	175.17	43.51
150X50X4.0	11.74	14.95	381.39	66.16	5.05	2.10	50.86	26.47	66.47	30.13	190.15	47.02
150X50X4.5	13.09	16.67	419.82	72.23	5.02	2.08	55.98	28.90	73.60	33.24	207.28	51.02
150X50X5.0	14.41	18.36	456.29	77.87	4.99	2.06	60.84	31.15	80.48	36.20	222.54	54.59
150X75X2.6	8.84	11.26	333.75	114.61	5.44	3.19	44.50	30.57	54.70	33.93	276.22	52.35
150X75X2.9	9.81	12.50	368.27	126.19	5.43	3.18	49.11	33.66	60.53	37.51	305.38	57.58
150X75X3.2	10.78	13.73	401.98	137.44	5.41	3.16	53.60	36.66	66.26	41.02	333.85	62.65
150X75X3.6	12.05	15.35	445.69	151.94	5.39	3.15	59.43	40.52	73.75	45.60	370.65	69.13
150X75X4.0	13.31	16.95	488.00	165.88	5.37	3.13	65.07	44.24	81.07	50.06	406.04	75.31
150X75X5.0	16.38	20.86	587.74	198.36	5.31	3.08	78.37	52.90	98.61	60.71	487.77	89.38
150X75X6.0	19.33	24.63	679.08	227.56	5.25	3.04	90.55	60.69	115.08	70.63	558.76	101.46
150X100X2.9	10.95	13.95	446.72	240.24	5.66	4.15	59.57	48.05	71.20	54.03	497.40	78.47
150X100X3.2	12.03	15.33	488.19	262.27	5.64	4.14	65.10	52.46	78.01	59.18	545.15	85.60
150X100X3.6	13.46	17.15	542.16	290.86	5.62	4.12	72.29	58.18	86.93	65.91	607.44	94.81
150X100X4.0	14.88	18.95	594.60	318.57	5.60	4.10	79.28	63.72	95.67	72.50	668.04	103.67
150X100X5.0	18.34	23.36	719.20	384.02	5.55	4.05	95.90	76.81	116.73	88.34	811.48	124.31
150X100X6.0	21.69	27.63	834.69	444.19	5.50	4.01	111.30	88.84	136.68	103.30	941.95	142.74
150X100X8.0	28.10	35.79	1039.29	549.48	5.39	3.92	138.58	109.90	173.31	130.63	1157.28	172.73
200X100X2.9	13.23	16.85	895.91	308.61	7.29	4.28	89.60	61.73	109.69	68.11	738.86	105.82
200X100X3.2	14.55	18.53	980.69	337.26	7.27	4.27	98.07	67.46	120.32	74.67	810.37	115.59
200X100X3.6	16.29	20.75	1091.47	374.54	7.25	4.25	109.15	74.91	134.30	83.26	903.95	128.26
200X100X4.0	18.02	22.95	1199.71	410.78	7.23	4.23	119.98	82.16	148.04	91.70	995.40	140.54
200X100X5.0	22.26	28.36	1459.25	496.94	7.17	4.19	145.93	99.39	181.37	112.09	1213.91	169.44
200X100X6.0	26.40	33.63	1703.31	576.91	7.12	4.14	170.34	115.39	213.27	131.50	1416.41	195.77

RECTANGULAR HOLLOW SECTION (RHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
200X100X8.0	34.38	43.79	2146.21	719.19	7.00	4.05	214.63	143.84	272.79	167.43	1765.96	240.49
240X120X4.0	21.78	27.75	2110.72	725.35	8.72	5.11	175.90	120.90	216.01	134.01	1745.55	207.11
240X120X5.0	26.97	34.36	2579.67	882.47	8.66	5.07	214.98	147.08	265.58	164.45	2141.72	251.48
240X120X6.0	32.05	40.83	3025.91	1030.45	8.61	5.02	252.16	171.75	313.41	193.69	2517.16	292.80
240X120X8.0	41.91	53.39	3851.84	1299.95	8.49	4.93	320.99	216.66	403.89	248.66	3196.64	366.11
250X100X4.0	21.16	26.95	2091.66	502.99	8.81	4.32	167.34	100.60	210.41	110.90	1335.40	177.41
250X100X5.0	26.19	33.36	2553.76	609.85	8.75	4.28	204.31	121.97	258.51	135.84	1631.59	214.59
250X100X6.0	31.11	39.63	2992.34	709.63	8.69	4.23	239.39	141.93	304.85	159.70	1908.64	248.83
250X100X8.0	40.66	51.79	3800.53	888.89	8.57	4.14	304.05	177.78	392.27	204.23	2397.53	308.31
250X150X4.0	24.30	30.95	2696.87	1234.24	9.33	6.31	215.75	164.57	259.61	183.27	2696.49	274.12
250X150X5.0	30.11	38.36	3304.18	1507.95	9.28	6.27	264.34	201.06	319.76	225.48	3322.96	334.43
250X150X6.0	35.82	45.63	3885.56	1768.35	9.23	6.23	310.85	235.78	378.05	266.28	3924.87	391.36
250X150X8.0	46.94	59.79	4972.24	2250.41	9.12	6.14	397.78	300.06	489.07	343.71	5043.97	494.90
250X150X10.0	57.63	73.42	5960.20	2682.88	9.01	6.04	476.82	357.72	592.79	415.67	6032.07	584.33
280X100X4.0	23.04	29.35	2785.31	558.32	9.74	4.36	198.96	111.67	252.63	122.42	1543.27	199.54
280X100X5.0	28.54	36.36	3406.60	677.60	9.68	4.32	243.33	135.52	310.80	150.09	1886.82	241.68
280X100X6.0	33.94	43.23	3998.76	789.27	9.62	4.27	285.63	157.86	367.00	176.62	2209.32	280.67
300X150X4.0	27.44	34.95	4196.67	1447.46	10.96	6.44	279.78	193.00	341.98	212.47	3455.16	330.97
300X150X5.0	34.04	43.36	5153.13	1770.87	10.90	6.39	343.55	236.12	421.90	261.73	4261.58	404.51
300X150X6.0	40.53	51.63	6073.51	2079.57	10.85	6.35	404.91	277.28	499.63	309.48	5039.24	474.31
300X150X8.0	53.22	67.79	7807.95	2654.12	10.73	6.26	520.53	353.89	648.55	400.51	6496.60	602.47
300X150X10.0	65.48	83.42	9403.90	3173.71	10.62	6.17	626.93	423.17	788.86	485.67	7804.31	715.07
300X200X4.0	30.58	38.95	5072.88	2736.56	11.41	8.38	338.20	273.66	401.18	304.84	5589.58	447.72
300X200X5.0	37.96	48.36	6241.05	3360.92	11.36	8.34	416.07	336.10	495.65	376.37	6919.17	549.43
300X200X6.0	45.24	57.63	7370.23	3962.19	11.31	8.29	491.35	396.22	587.83	446.07	8214.59	646.97
300X200X8.0	59.50	75.79	9513.66	5097.04	11.20	8.20	634.25	509.71	765.35	579.99	10688.71	829.36
300X200X10.0	73.33	93.42	11507.24	6144.30	11.10	8.11	767.15	614.43	933.86	706.73	12983.61	994.50
300X200X12.0	86.77	110.53	13354.97	7107.11	10.99	8.02	890.34	710.72	1093.47	826.41	15071.27	1141.95
350X250X5.0	45.81	58.36	10519.88	6305.84	13.43	10.39	601.14	504.47	709.04	564.76	12375.85	814.43
350X250X6.0	54.66	69.63	12457.31	7458.44	13.38	10.35	711.85	596.68	842.61	670.85	14733.26	962.58
350X250X8.0	72.06	91.79	16170.48	9659.06	13.27	10.26	924.03	772.73	1101.63	876.27	19295.99	1243.82
350X250X10.0	89.03	113.42	19672.08	11723.53	13.17	10.17	1124.12	937.89	1349.92	1072.79	23627.09	1504.66
350X250X12.0	105.61	134.53	22966.89	13655.73	13.07	10.08	1312.40	1092.46	1587.60	1260.54	27692.08	1744.69
400X200X5.0	45.81	58.36	12489.82	4311.75	14.63	8.60	624.50	431.18	762.43	473.87	10269.69	739.55
400X200X6.0	54.66	69.63	14789.35	5091.63	14.57	8.55	739.47	509.17	905.99	562.47	12205.15	872.78
400X200X8.0	72.06	91.79	19195.28	6572.45	14.46	8.46	959.77	657.25	1184.31	733.59	15926.47	1124.29
400X200X10.0	89.03	113.42	23348.08	7950.97	14.35	8.37	1167.41	795.10	1450.98	896.73	19422.50	1355.55
400X200X12.0	105.61	134.53	27252.93	9230.63	14.23	8.28	1362.65	923.07	1706.13	1052.01	22662.53	1566.20
300X200X14.0	99.78	127.11	15060.82	7988.55	10.89	7.93	1004.06	798.86	1244.30	939.14	16924.33	1271.23
400X200X14.0	121.76	155.11	30915.01	10414.85	14.12	8.19	1545.76	1041.49	1949.87	1199.54	25616.52	1755.81
400X300X6.0	64.08	81.63	19446.79	12557.11	15.43	12.40	972.34	837.15	1142.39	940.63	23929.98	1338.20
400X300X8.0	84.62	107.79	25342.70	16336.49	15.33	12.31	1267.14	1089.10	1497.91	1232.55	31464.16	1738.28

RECTANGULAR HOLLOW SECTION (RHS) IS : 4923 : 2017/EN 10219-1 : 2006*/ASTM A-500 UPCOMING SIZES												
Dimension	Weight	Area	Moment of Inertia		Radius of Gyration		Elastic Modulus		Plastic Modulus		Torsional Constants	
mm	kg/m	cm2	I _{xx}	I _{yy}	R _{xx}	R _{yy}	Z _{xx}	Z _{yy}	S _{xx}	S _{yy}	J	C
			cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	cm ⁴	cm ³
400X300X10.0	104.73	133.42	30954.74	19920.57	15.23	12.22	1547.74	1328.04	1840.98	1513.86	38709.68	2114.80
400X300X12.0	124.45	158.53	36288.45	23314.01	15.13	12.13	1814.43	1554.27	2171.73	1784.67	45625.84	2467.39
400X300X14.0	143.74	183.11	41349.30	26521.41	15.03	12.03	2067.47	1768.10	2490.27	2045.10	52172.04	2795.60
400X300X16.0	162.63	207.17	46142.73	29547.33	14.92	11.94	2307.14	1969.83	2796.72	2295.29	58308.01	3098.98
400X300X18.0	181.10	230.70	50674.11	32396.29	14.82	11.85	2533.71	2159.76	3091.21	2535.33	63994.05	3377.06
400X300X20.0	199.15	253.70	54948.80	35072.75	14.72	11.76	2747.44	2338.19	3373.85	2765.36	69191.33	3629.36
500X200X6.0	64.08	81.63	25690.13	6221.07	17.74	8.73	1027.61	622.11	1284.16	678.87	16353.70	1098.63
500X200X8.0	84.62	107.79	33466.50	8047.87	17.62	8.64	1338.66	804.79	1683.27	887.19	21366.48	1419.28
500X200X10.0	104.73	133.42	40860.16	9757.63	17.50	8.55	1634.41	975.77	2068.10	1086.73	26105.40	1716.72
500X200X12.0	124.45	158.53	47877.48	11354.15	17.38	8.46	1915.10	1135.42	2438.78	1277.61	30538.24	1990.64
500X200X14.0	143.74	183.11	54524.82	12841.14	17.26	8.37	2181.00	1284.12	2795.43	1459.94	34633.43	2240.67
500X200X16.0	162.63	207.17	60808.49	14222.30	17.13	8.29	2432.34	1422.23	3138.16	1633.85	38360.40	2466.45
500X200X18.0	181.10	230.70	66734.75	15501.28	17.01	8.20	2669.39	1550.13	3467.09	1799.45	41689.87	2667.57
500X200X20.0	199.15	253.70	72309.80	16681.66	16.88	8.11	2892.40	1668.17	3782.35	1956.86	44594.14	2843.63
500X300X8.0	97.18	123.79	43149.92	19747.90	18.67	12.63	1726.00	1316.53	2076.87	1466.15	43143.80	2192.97
500X300X10.0	120.43	153.42	52866.82	24127.24	18.56	12.54	2114.68	1608.49	2558.10	1803.86	53167.39	2675.40
500X300X12.0	143.29	182.53	62169.00	28293.53	18.46	12.45	2486.76	1886.24	3024.38	2130.27	62797.85	3130.85
500X300X14.0	165.72	211.11	71063.12	32251.70	18.35	12.36	2842.53	2150.12	3475.83	2445.50	71991.13	3558.92
500X300X16.0	187.75	239.17	79555.80	36006.64	18.24	12.27	3182.24	2400.45	3912.56	2749.69	80703.46	3959.20
500X300X18.0	209.36	266.70	87653.63	39563.17	18.13	12.18	3506.15	2637.55	4334.69	3042.93	88891.60	4331.25
500X300X20.0	230.55	293.70	95363.14	42926.09	18.02	12.09	3814.53	2861.74	4742.35	3325.36	96513.06	4674.62
600X200X6.0	73.50	93.63	40672.54	7350.51	20.84	8.86	1355.76	735.06	1722.32	795.27	20598.47	1324.49
600X200X8.0	97.18	123.79	53127.31	9523.28	20.72	8.77	1770.92	952.33	2262.23	1040.79	26928.52	1714.30
600X200X10.0	120.43	153.42	65043.47	11564.30	20.59	8.68	2168.12	1156.43	2785.23	1276.73	32934.16	2077.94
600X200X12.0	143.29	182.53	76428.61	13477.67	20.46	8.59	2547.63	1347.77	3291.44	1503.21	38582.25	2415.16
600X200X14.0	165.72	211.11	87290.27	15267.43	20.33	8.50	2909.68	1526.75	3780.99	1720.34	43840.48	2725.67
600X200X16.0	187.75	239.17	97635.94	16937.61	20.20	8.42	3254.54	1693.77	4254.00	1928.25	48677.53	3009.14
600X200X18.0	209.36	266.70	107473.08	18492.16	20.07	8.33	3582.44	1849.22	4710.57	2127.05	53063.38	3265.24
600X200X20.0	230.55	293.70	116809.10	19935.00	19.94	8.24	3893.64	1993.50	5150.84	2316.86	56969.59	3493.63
600X300X8.0	109.74	139.79	67146.73	23159.31	21.92	12.87	2238.23	1543.96	2735.83	1699.75	55282.51	2647.72
600X300X10.0	136.13	173.42	82450.14	28333.90	21.80	12.78	2748.34	1888.93	3375.23	2093.86	68185.35	3236.10
600X300X12.0	162.13	206.53	97176.13	33273.05	21.69	12.69	3239.21	2218.21	3997.04	2475.87	80627.77	3794.47
600X300X14.0	187.70	239.11	111332.56	37981.99	21.58	12.60	3711.09	2532.14	4601.39	2845.90	92563.22	4322.49
600X300X16.0	212.87	271.17	124927.25	42465.94	21.46	12.51	4164.25	2831.07	5188.40	3204.09	103945.54	4819.77
600X300X18.0	237.62	302.70	137967.96	46730.05	21.35	12.42	4598.94	3115.34	5758.17	3550.53	114729.07	5285.92
600X300X20.0	261.95	333.70	150462.43	50779.42	21.23	12.34	5015.42	3385.30	6310.84	3885.36	124868.90	5720.52
600X400X8.0	122.30	155.79	81166.14	43784.94	22.83	16.76	2705.54	2189.25	3209.43	2438.71	89433.21	3581.75
600X400X10.0	151.83	193.42	99856.81	53774.74	22.72	16.67	3328.57	2688.74	3965.23	3010.98	110706.68	4395.41
600X400X12.0	180.97	230.53	117923.65	63395.01	22.62	16.58	3930.79	3169.76	4702.64	3568.53	131433.38	5175.73
600X400X14.0	209.68	267.11	135374.85	72652.18	22.51	16.49	4512.50	3632.61	5421.79	4111.47	151556.54	5922.35
600X400X16.0	237.99	303.17	152218.55	81552.65	22.41	16.40	5073.96	4077.64	6122.80	4639.92	171019.37	6634.88
600X400X18.0	265.88	338.70	168462.84	90102.75	22.30	16.31	5615.43	4505.14	6805.77	5154.01	189765.23	7312.91
600X400X20.0	293.35	373.70	184115.76	98308.80	22.20	16.22	6137.20	4915.44	7470.84	5653.85	207737.81	7956.01

RHS (Rectangular Hollow Section) Sizes

SIZE	0.8	1.0	1.2	1.4	1.6	2.0	2.2	2.6	2.9	3.2	3.6	4.0	4.5	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
25X20																						
26X13																						
30X20																						
40X20																						
40X10																						
40X25																						
45X35																						
50X25																						
50X30																						
50X40																						
66X33																						
60X30																						
60X40																						
75X25																						
75X30																						
75X40																						
75X50																						
80X40																						
96X48																						
100X50																						
120X60																						
120X80																						
122X61																						
130X50																						
145X82																						
150X30																						
150X50																						
150X75																						
150X100																						
160X80																						
172X92																						
180X60																						
180X120																						
200X100																						
200X150																						
220X140																						
240X120																						
250X100																						
250X150																						
300X150																						
300X200																						
300X100																						
350X250																						
400X200																						
400X350																						
500X200																						
500X300																						
600X200																						
600X400																						

TENSILE PROPERTIES OF STEEL TUBES FOR STRUCTURAL PURPOSE IS 1161:2014, TABLE 2, (Clauses 3.1 and 11.2)				
S. No.	Grade	Tensile Strength	Yield Strength	Elongation on Gauge Length
		Min	Min	5.65 $\sqrt{S_0}$ Min
		MPa	MPa	Percent
1	YSt 210	330	210	20
2	YSt 240	410	240	17
3	YSt 310	450	310	14
4	YSt 355	490	355	10

TENSILE PROPERTIES OF STEEL TUBES SECTIONS IS 4923:2017, TABLE 4, (Clauses 19.2)				
S. No.	Grade	Tensile Strength	Yield Strength	Elongation
		Min	Min	Min
		MPa	MPa	Percent
1	YSt 210	330	210	20
2	YSt 240	410	240	15
3	YSt 310	450	310	10
4	YSt 355	490	355	10

CHEMICAL & MECHANICAL PROPERTIES									
IS 2062:2011 (Clauses 5, 8.1, 8.2, 10.3, 10.3.1, 11.3.1, 12.2)									
Grade Designation	Ladle Analysis, Percent, Max					Carbon Equivalent (CE), Max	Tensile Strength R _m , Min MPa	Yield Stress	Percentage Elongation A _{min} at Gauge Length L=5.65
	C	Mn	S	P	Si				
E 250	0.22	1.50	0.045	0.045	0.40	0.41	410	250	23
E 300	0.20	1.50	0.045	0.045	0.45	0.44	440	300	22
E 350	0.20	1.55	0.045	0.045	0.45	0.47	490	350	22
E 410	0.20	1.60	0.045	0.045	0.45	0.50	540	410	20

CHEMICAL COMPOSITION & MECHANICAL PROPERTIES								
IS 10748:2004 Table 1 & 3 (Clauses 7.1, 7.2, 8.3 & 9.2.4)								
Grade	Ladle Analysis, Percent, Max				Carbon Equivalent	Tensile Strength	Yield Stress	Percentage Elongation, min at Gauge Length
	C	Mn	S	P	(CE), Max	Min, MPa	Min, MPa	5.65√S ₀
1	0.10	0.50	0.040	0.040	-	290	170	30
2	0.12	0.60	0.040	0.040	-	330	210	28
3	0.16	1.20	0.040	0.040	-	410	240	25
4	0.20	1.30	0.040	0.040	0.45	430	275	20
5	0.25	1.30	0.040	0.040	0.45	490	310	15



INTERNATIONAL AIRPORT, LUCKNOW

CIRCULAR HOLLOW SECTION

Product Range

21.3mm to 355.6mm

Thickness

1mm to 10mm



CIRCULAR HOLLOW SECTION FOR STRUCTURAL PURPOSES CONFORMING TO IS:1161 : 2014										
Outside Diameter	Thickness	Mass	Area of Cross Section	Internal Volume	Moment of Inertia	Elastic Modulus	Plastic Modulus	Radius of Gyration	Square of Radius of Gyration	Torsional Constant
mm	mm	kg/m	cm ²	cm ³ /m	cm ⁴	cm ³	cm ³	cm	cm ²	cm ³
21.30	1.60	0.78	0.99	257	0.48	0.45	0.62	0.70	0.49	0.91
21.30	1.80	0.87	1.10	246	0.53	0.50	0.69	0.69	0.48	0.99
21.30	2.00	0.95	1.21	235	0.57	0.54	0.75	0.69	0.47	1.07
21.30	2.30	1.08	1.37	219	0.63	0.59	0.83	0.68	0.46	1.18
21.30	2.60	1.20	1.53	204	0.68	0.64	0.92	0.67	0.45	1.28
21.30	2.90	1.32	1.68	189	0.73	0.68	0.99	0.66	0.43	1.37
26.90	1.60	1.00	1.27	441	1.02	0.76	1.03	0.90	0.80	1.52
26.90	1.80	1.11	1.42	426	1.12	0.84	1.14	0.89	0.79	1.67
26.90	2.00	1.23	1.56	412	1.22	0.91	1.24	0.88	0.78	1.81
26.90	2.30	1.40	1.78	391	1.36	1.01	1.40	0.87	0.76	2.02
26.90	2.60	1.56	1.98	370	1.48	1.10	1.54	0.86	0.75	2.20
26.90	2.90	1.72	2.19	350	1.60	1.19	1.68	0.85	0.73	2.38
33.70	1.60	1.27	1.61	731	2.08	1.24	1.65	1.14	1.29	2.47
33.70	1.80	1.42	1.80	712	2.30	1.37	1.83	1.13	1.28	2.73
33.70	2.00	1.56	1.99	693	2.51	1.49	2.01	1.12	1.26	2.98
33.70	2.30	1.78	2.27	665	2.81	1.67	2.27	1.11	1.24	3.34
33.70	2.60	1.99	2.54	638	3.09	1.84	2.52	1.10	1.22	3.67
33.70	2.90	2.20	2.81	611	3.36	1.99	2.76	1.09	1.20	3.98
33.70	3.20	2.41	3.07	585	3.60	2.14	2.99	1.08	1.18	4.28
33.70	3.60	2.67	3.40	552	3.91	2.32	3.28	1.07	1.15	4.64
38.10	3.00	2.60	3.31	809	5.13	2.69	3.71	1.25	1.55	5.39
38.10	4.00	3.36	4.29	712	6.31	3.31	4.67	1.21	1.47	6.63
38.10	5.00	4.08	5.20	620	7.28	3.82	5.52	1.18	1.40	7.65
38.10	6.00	4.75	6.05	535	8.07	4.23	6.25	1.15	1.33	8.47
38.10	8.00	5.94	7.56	384	9.17	4.82	7.42	1.10	1.21	9.63
42.40	1.60	1.61	2.05	1207	4.27	2.02	2.66	1.44	2.08	4.03
42.40	1.80	1.80	2.30	1182	4.74	2.24	2.97	1.44	2.06	4.47
42.40	2.00	1.99	2.54	1158	5.19	2.45	3.27	1.43	2.05	4.90
42.40	2.30	2.27	2.90	1122	5.84	2.76	3.70	1.42	2.02	5.51
42.40	2.60	2.55	3.25	1087	6.46	3.05	4.12	1.41	1.99	6.10
42.40	2.90	2.83	3.60	1052	7.06	3.33	4.53	1.40	1.96	6.66
42.40	3.20	3.09	3.94	1018	7.62	3.59	4.93	1.39	1.93	7.19
42.40	3.60	3.45	4.39	973	8.33	3.93	5.44	1.38	1.90	7.86
48.30	1.60	1.84	2.35	1598	6.41	2.65	3.49	1.65	2.73	5.31
48.30	1.80	2.06	2.63	1569	7.12	2.95	3.89	1.65	2.71	5.89
48.30	2.00	2.28	2.91	1541	7.81	3.23	4.29	1.64	2.68	6.47
48.30	2.30	2.61	3.32	1500	8.81	3.65	4.87	1.63	2.65	7.30
48.30	2.60	2.93	3.73	1459	9.78	4.05	5.44	1.62	2.62	8.10
48.30	2.90	3.25	4.14	1419	10.70	4.43	5.99	1.61	2.59	8.86
48.30	3.00	3.35	4.27	1405	11.00	4.55	6.17	1.61	2.58	9.11
48.30	3.20	3.56	4.53	1379	11.59	4.80	6.52	1.60	2.56	9.59
48.30	3.60	3.97	5.06	1327	12.71	5.26	7.21	1.59	2.51	10.52
48.30	4.00	4.37	5.57	1276	13.77	5.70	7.87	1.57	2.47	11.40
48.30	4.50	4.86	6.19	1213	15.01	6.21	8.66	1.56	2.42	12.43
48.30	5.00	5.34	6.80	1152	16.15	6.69	9.42	1.54	2.37	13.38
48.30	6.00	6.26	7.97	1035	18.19	7.53	10.81	1.51	2.28	15.07
48.30	8.00	7.95	10.13	819	21.37	8.85	13.16	1.45	2.11	17.70

Circular Hollow Section for Structural Purposes conforming to IS:1161 : 2014										
Outside Diameter	Thickness	Mass	Area of Cross Section	Internal Volume	Moment of Inertia	Elastic Modulus	Plastic Modulus	Radius of Gyration	Square of Radius of Gyration	Torsional Constant
mm	mm	kg/m	cm ²	cm ³ /m	cm ⁴	cm ³	cm ³	cm	cm ²	cm ³
60.30	1.60	2.32	2.95	2561	12.72	4.22	5.51	2.08	4.31	8.44
60.30	2.00	2.88	3.66	2489	15.58	5.17	6.80	2.06	4.25	10.34
60.30	2.30	3.29	4.19	2437	17.65	5.85	7.74	2.05	4.21	11.71
60.30	2.60	3.70	4.71	2384	19.65	6.52	8.66	2.04	4.17	13.04
60.30	2.90	4.11	5.23	2333	21.59	7.16	9.56	2.03	4.13	14.32
60.30	3.00	4.24	5.40	2316	22.22	7.37	9.86	2.03	4.12	14.74
60.30	3.20	4.51	5.74	2282	23.47	7.78	10.44	2.02	4.09	15.57
60.30	3.60	5.03	6.41	2215	25.87	8.58	11.59	2.01	4.03	17.16
60.30	4.00	5.55	7.07	2148	28.17	9.34	12.70	2.00	3.98	18.69
60.30	4.50	6.19	7.89	2067	30.90	10.25	14.04	1.98	3.92	20.50
60.30	5.00	6.82	8.69	1987	33.48	11.10	15.33	1.96	3.85	22.21
60.30	6.00	8.04	10.24	1832	38.18	12.66	17.76	1.93	3.73	25.33
60.30	8.00	10.32	13.14	1541	45.99	15.25	22.05	1.87	3.50	30.51
76.10	2.00	3.66	4.66	4083	31.98	8.40	10.98	2.62	6.87	16.81
76.10	2.30	4.19	5.33	4015	36.34	9.55	12.53	2.61	6.81	19.10
76.10	2.60	4.71	6.00	3948	40.59	10.67	14.05	2.60	6.76	21.34
76.10	2.90	5.24	6.67	3882	44.74	11.76	15.55	2.59	6.71	23.52
76.10	3.20	5.75	7.33	3816	48.78	12.82	17.02	2.58	6.66	25.64
76.10	3.60	6.44	8.20	3728	54.01	14.19	18.94	2.57	6.59	28.39
76.10	4.00	7.11	9.06	3642	59.06	15.52	20.81	2.55	6.52	31.04
76.10	4.50	7.95	10.12	3536	65.12	17.11	23.10	2.54	6.43	34.23
76.10	5.00	8.77	11.17	3432	70.92	18.64	25.32	2.52	6.35	37.28
76.10	6.00	10.37	13.21	3227	81.76	21.49	29.56	2.49	6.19	42.97
76.10	8.00	13.44	17.12	2837	100.59	26.44	37.27	2.42	5.88	52.87
76.10	9.00	14.90	18.97	2651	108.70	28.57	40.76	2.39	5.73	57.13
88.90	2.00	4.29	5.46	5661	51.57	11.60	15.11	3.07	9.44	23.20
88.90	2.30	4.91	6.26	5581	58.70	13.21	17.25	3.06	9.38	26.41
88.90	2.60	5.53	7.05	5502	65.68	14.78	19.37	3.05	9.32	29.55
88.90	2.90	6.15	7.84	5424	72.52	16.31	21.46	3.04	9.26	32.63
88.90	3.20	6.76	8.62	5346	79.21	17.82	23.51	3.03	9.19	35.64
88.90	3.60	7.57	9.65	5242	87.90	19.77	26.21	3.02	9.11	39.55
88.90	4.00	8.38	10.67	5140	96.34	21.67	28.85	3.00	9.03	43.35
88.90	4.50	9.37	11.93	5014	106.54	23.97	32.09	2.99	8.93	47.94
88.90	5.00	10.35	13.18	4889	116.37	26.18	35.24	2.97	8.83	52.36
88.90	6.00	12.27	15.63	4645	134.94	30.36	41.31	2.94	8.64	60.72
88.90	8.00	15.96	20.33	4174	167.97	37.79	52.53	2.87	8.26	75.58
88.90	9.00	17.74	22.59	3948	182.57	41.07	57.70	2.84	8.08	82.14
88.90	10.00	19.46	24.79	3728	195.98	44.09	62.59	2.81	7.91	88.18
101.60	2.00	4.91	6.26	7482	77.63	15.28	19.84	3.52	12.41	30.56
101.60	2.30	5.63	7.18	7390	88.48	17.42	22.68	3.51	12.33	34.84
101.60	2.60	6.35	8.09	7299	99.14	19.52	25.49	3.50	12.26	39.03
101.60	2.90	7.06	8.99	7208	109.59	21.57	28.26	3.49	12.19	43.15
101.60	3.20	7.77	9.89	7118	119.85	23.59	31.00	3.48	12.12	47.19
101.60	3.60	8.70	11.08	6999	133.24	26.23	34.59	3.47	12.02	52.46
101.60	4.00	9.63	12.26	6881	146.28	28.80	38.12	3.45	11.93	57.59
101.60	4.50	10.78	13.73	6735	162.13	31.92	42.46	3.44	11.81	63.83
101.60	5.00	11.91	15.17	6590	177.47	34.93	46.70	3.42	11.70	69.87

Circular Hollow Section for Structural Purposes conforming to IS:1161 : 2014										
Outside Diameter	Thickness	Mass	Area of Cross Section	Internal Volume	Moment of Inertia	Elastic Modulus	Plastic Modulus	Radius of Gyration	Square of Radius of Gyration	Torsional Constant
mm	mm	kg/m	cm ²	cm ³ /m	cm ⁴	cm ³	cm ³	cm	cm ²	cm ³
114.30	2.00	5.54	7.06	9555	111.27	19.47	25.23	3.97	15.77	38.94
114.30	2.30	6.35	8.09	9452	126.95	22.21	28.86	3.96	15.69	44.43
114.30	2.60	7.16	9.12	9348	142.37	24.91	32.45	3.95	15.60	49.82
114.30	2.90	7.97	10.15	9246	157.55	27.57	36.00	3.94	15.52	55.13
114.30	3.00	8.24	10.49	9212	162.55	28.44	37.17	3.94	15.50	56.88
114.30	3.20	8.77	11.17	9144	172.47	30.18	39.51	3.93	15.44	60.36
114.30	3.60	9.83	12.52	9009	191.98	33.59	44.13	3.92	15.33	67.19
114.30	4.00	10.88	13.86	8875	211.07	36.93	48.69	3.90	15.23	73.86
114.30	4.50	12.19	15.52	8709	234.32	41.00	54.28	3.89	15.10	82.00
114.30	5.00	13.48	17.17	8544	256.92	44.96	59.77	3.87	14.96	89.91
114.30	6.00	16.03	20.41	8219	300.21	52.53	70.45	3.83	14.71	105.06
127.00	2.00	6.17	7.85	11882	153.44	24.16	31.25	4.42	19.54	48.33
127.00	2.60	7.98	10.16	11652	196.65	30.97	40.24	4.40	19.35	61.94
127.00	2.90	8.88	11.31	11537	217.78	34.30	44.67	4.39	19.26	68.59
127.00	3.00	9.18	11.69	11499	224.75	35.39	46.14	4.39	19.23	70.79
127.00	3.20	9.77	12.45	11423	238.60	37.57	49.06	4.38	19.17	75.15
127.00	3.60	10.96	13.96	11272	265.87	41.87	54.83	4.36	19.05	83.74
127.00	4.00	12.14	15.46	11122	292.61	46.08	60.54	4.35	18.93	92.16
127.00	4.50	13.60	17.32	10936	325.29	51.23	67.56	4.33	18.78	102.45
127.00	5.00	15.05	19.16	10751	357.14	56.24	74.46	4.32	18.64	112.48
127.00	6.00	17.91	22.81	10387	418.44	65.90	87.92	4.28	18.35	131.79
139.70	2.60	8.79	11.20	14208	263.21	37.68	48.88	4.85	23.50	75.36
139.70	2.90	9.79	12.46	14082	291.68	41.76	54.28	4.84	23.40	83.52
139.70	3.20	10.77	13.72	13956	319.78	45.78	59.63	4.83	23.30	91.56
139.70	3.60	12.09	15.39	13789	356.65	51.06	66.70	4.81	23.17	102.12
139.70	4.00	13.39	17.05	13623	392.86	56.24	73.68	4.80	23.04	112.49
139.70	4.50	15.01	19.11	13417	437.20	62.59	82.29	4.78	22.87	125.18
139.70	5.00	16.61	21.16	13212	480.54	68.80	90.76	4.77	22.71	137.59
139.70	6.00	19.79	25.20	12808	564.26	80.78	107.33	4.73	22.39	161.56
139.70	8.00	25.99	33.10	12018	720.29	103.12	138.93	4.66	21.76	206.24
165.10	2.60	10.42	13.27	20081	438.23	53.09	68.66	5.75	33.02	106.17
165.10	2.90	11.60	14.78	19931	486.13	58.89	76.30	5.74	32.90	117.78
165.10	3.20	12.78	16.28	19781	533.48	64.63	83.89	5.73	32.78	129.25
165.10	3.60	14.34	18.27	19582	595.79	72.17	93.91	5.71	32.62	144.35
165.10	4.00	15.89	20.24	19384	657.16	79.61	103.83	5.70	32.46	159.22
165.10	4.50	17.83	22.70	19138	732.57	88.74	116.10	5.68	32.27	177.49
165.10	5.00	19.75	25.15	18894	806.54	97.70	128.20	5.66	32.07	195.41
165.10	6.00	23.55	29.99	18409	950.25	115.11	151.95	5.63	31.69	230.22
165.10	8.00	31.00	39.48	17460	1221.25	147.94	197.61	5.56	30.93	295.88
168.30	2.60	10.63	13.53	20893	464.63	55.21	71.39	5.86	34.33	110.43
168.30	2.90	11.83	15.07	20739	515.46	61.26	79.34	5.85	34.21	122.51
168.30	3.20	13.03	16.60	20587	565.74	67.23	87.24	5.84	34.09	134.46
168.30	3.60	14.63	18.63	20384	631.90	75.09	97.67	5.82	33.92	150.18
168.30	4.00	16.21	20.65	20182	697.09	82.84	108.00	5.81	33.76	165.68
168.30	4.50	18.18	23.16	19931	777.22	92.36	120.77	5.79	33.56	184.72
168.30	5.00	20.14	25.65	19681	855.85	101.70	133.38	5.78	33.36	203.41
168.30	6.00	24.02	30.59	19187	1008.69	119.87	158.12	5.74	32.97	239.74

Circular Hollow Section for Structural Purposes conforming to IS:1161 : 2014										
Outside Diameter	Thickness	Mass	Area of Cross Section	Internal Volume	Moment of Inertia	Elastic Modulus	Plastic Modulus	Radius of Cyration	Square of Radius of Cyration	Torsional Constant
mm	mm	kg/m	cm ²	cm ³ /m	cm ⁴	cm ³	cm ³	cm	cm ²	cm ³
168.30	8.00	31.63	40.29	18218	1297.27	154.16	205.74	5.67	32.20	308.32
193.70	2.60	12.26	15.61	27907	712.68	73.59	94.96	6.76	45.66	147.17
193.70	2.90	13.65	17.38	27730	791.21	81.69	105.58	6.75	45.52	163.39
193.70	3.20	15.04	19.15	27553	869.00	89.73	116.14	6.74	45.38	179.45
193.70	3.60	16.88	21.50	27318	971.55	100.31	130.11	6.72	45.19	200.63
193.70	4.00	18.72	23.84	27084	1072.79	110.77	143.97	6.71	45.00	221.54
193.70	4.50	21.00	26.75	26793	1197.52	123.65	161.12	6.69	44.77	247.29
193.70	5.00	23.27	29.64	26504	1320.23	136.32	178.08	6.67	44.54	272.63
193.70	6.00	27.78	35.38	25930	1559.72	161.05	211.46	6.64	44.08	322.09
193.70	8.00	36.64	46.67	24801	2015.54	208.11	276.05	6.57	43.19	416.22
219.10	2.60	13.88	17.68	35934	1036.26	94.59	121.87	7.65	58.60	189.19
219.10	2.90	15.47	19.70	35733	1151.07	105.07	135.56	7.64	58.44	210.15
219.10	3.20	17.04	21.70	35532	1264.92	115.47	149.17	7.63	58.28	230.93
219.10	3.60	19.14	24.37	35266	1415.22	129.19	167.20	7.62	58.07	258.37
219.10	4.00	21.22	27.03	35000	1563.84	142.75	185.09	7.61	57.86	285.50
219.10	5.00	26.41	33.63	34340	1928.04	176.00	229.24	7.57	57.33	351.99
219.10	6.00	31.54	40.17	33686	2281.95	208.30	272.54	7.54	56.81	416.60
219.10	8.00	41.66	53.06	32397	2959.63	270.16	356.68	7.47	55.78	540.33
219.10	10.00	51.58	65.69	31134	3598.44	328.47	437.56	7.40	54.78	656.95
244.50	4.00	23.73	30.22	43929	2185.67	178.79	231.38	8.50	72.32	357.57
244.50	5.00	29.54	37.62	43189	2698.58	220.74	286.84	8.47	71.73	441.49
244.50	6.00	35.30	44.96	42456	3198.53	261.64	341.37	8.43	71.15	523.28
244.50	8.00	46.67	59.44	41007	4160.45	340.32	447.63	8.37	70.00	680.65
244.50	10.00	57.84	73.67	39584	5073.15	414.98	550.24	8.30	68.86	829.96
273.00	5.00	33.05	42.10	54325	3780.81	276.98	359.16	9.48	89.81	553.97
273.00	6.00	39.52	50.33	53502	4487.08	328.72	427.81	9.44	89.16	657.45
273.00	8.00	52.29	66.60	51875	5851.71	428.70	561.97	9.37	87.86	857.39
273.00	10.00	64.87	82.62	50273	7154.09	524.11	692.02	9.31	86.59	1048.22
273.00	12.00	77.25	98.39	48695	8396.14	615.10	818.03	9.24	85.33	1230.20
323.90	5.00	39.33	50.09	77388	6369.42	393.30	508.53	11.28	127.15	786.59
323.90	6.00	47.05	59.92	76405	7572.47	467.58	606.43	11.24	126.37	935.16
323.90	8.00	62.34	79.39	74458	9910.08	611.92	798.51	11.17	124.82	1223.84
323.90	10.00	77.43	98.61	72536	12158.34	750.75	985.67	11.10	123.29	1501.49
323.90	12.00	92.32	117.58	70639	14319.56	884.20	1167.96	11.04	121.78	1768.39
355.60	6.00	51.74	65.90	92725	10070.55	566.40	733.39	12.36	152.82	1132.80
355.60	8.00	68.59	87.36	90579	13201.37	742.48	966.78	12.29	151.11	1484.97
355.60	10.00	85.25	108.57	88457	16223.50	912.46	1194.73	12.22	149.42	1824.92
355.60	12.00	101.70	129.53	86361	19139.47	1076.46	1417.31	12.16	147.76	2152.92
377.00	6.00	54.91	69.93	104635	12035.01	638.46	825.92	13.12	172.10	1276.92
377.00	8.00	72.81	92.74	102354	15791.85	837.76	1089.46	13.05	170.28	1675.53
377.00	10.00	90.52	115.30	100098	19425.87	1030.55	1347.22	12.98	168.49	2061.10
377.00	12.00	108.04	137.60	97868	22939.76	1216.96	1599.28	12.91	166.71	2433.93
406.40	6.00	59.26	75.47	122170	15128.33	744.50	961.99	14.16	200.45	1489.01
406.40	8.00	78.62	100.13	119704	19873.89	978.05	1269.95	14.09	198.48	1956.09
406.40	10.00	97.78	124.53	117264	24475.81	1204.52	1571.66	14.02	196.54	2409.04
406.40	12.00	116.74	148.69	114849	28937.01	1424.07	1867.19	13.95	194.62	2848.13
Tolerance										
A - Thickness		Tolerance		B- Weight				Tolerance		Length Tolerance
1. Light Tubes		+ not limited -8%		1. Single Tube (Light Series)				+10% -8%		Unless otherwise Specified 4 to 7 mtrs. Can also be supplied in Fix Lengths ±5cm.
2. Medium & Heavy Tubes		+ not limited -10%		2. Single Tube (Medium & Heavy Series)				±10%		
				3. For quantities per load of 10 tonnes minimum (Light Series)				+7.5% - 5%		
				4. For quantities per load of 10 tonnes minimum (Medium and Heavy Series)				±7.5%		

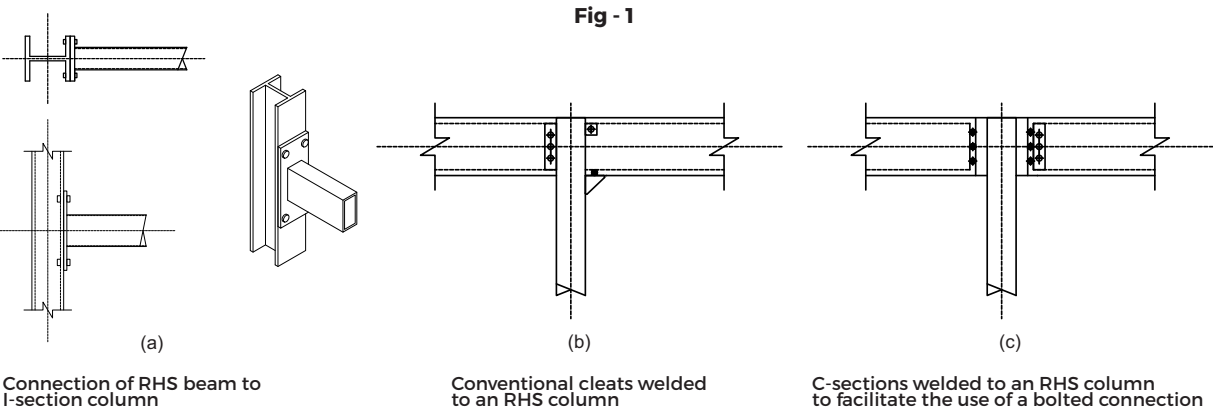
CHS (Circular Hollow Section) Sizes

[illegible]

TUBULAR CONNECTION

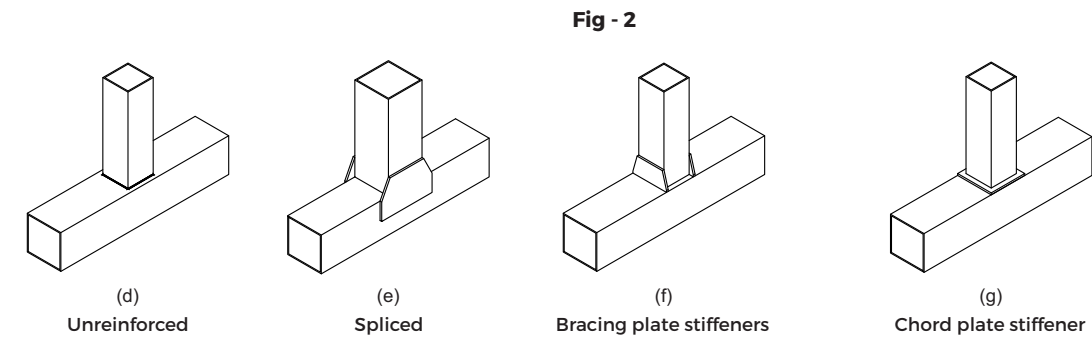
WELDED AND BOLTED CONNECTION

Beams and columns are usually connected on site by bolting. In the case of an RHS beam connection to an I-section column, a welded extended end-plate to the RHS beam permits the use of a conventional bolted connection to the column flange or web (see Figure 1.a). The bolts may be countersunk into the thick end-plate if the connection is important visually. A number of typical simple connections using cleats welded to an RHS column are shown in Figures 1.b to c. Figure 1(b) shows a fin plate welded to the face of the column and the supporting bracket can be detailed to be visually interesting. Figure 1(c) shows the use of channels welded at the tips of their flanges.



VIERENDEEL TRUSSES

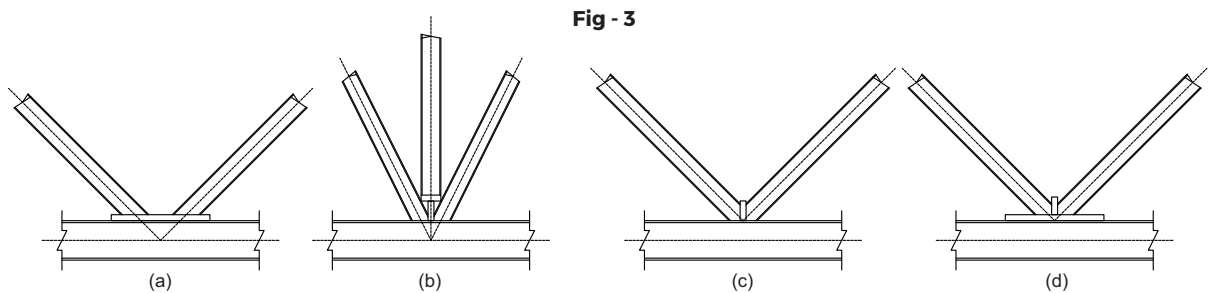
are relatively inefficient at resisting high shear-forces because of the lack of diagonal bracing and, therefore, it is necessary to use thicker or larger chord members than in triangulated trusses. Ideally, the chord and vertical members should be the same external size. If not, stiffening elements are generally inserted to increase the local bending resistance of the connections. Figure 2 shows various ways in which nominally pinned connections can be strengthened in Vierendeel trusses.



Various ways in which normally pinned connection can be strength Fig - 6 (c)(d)(e)(f)(g)

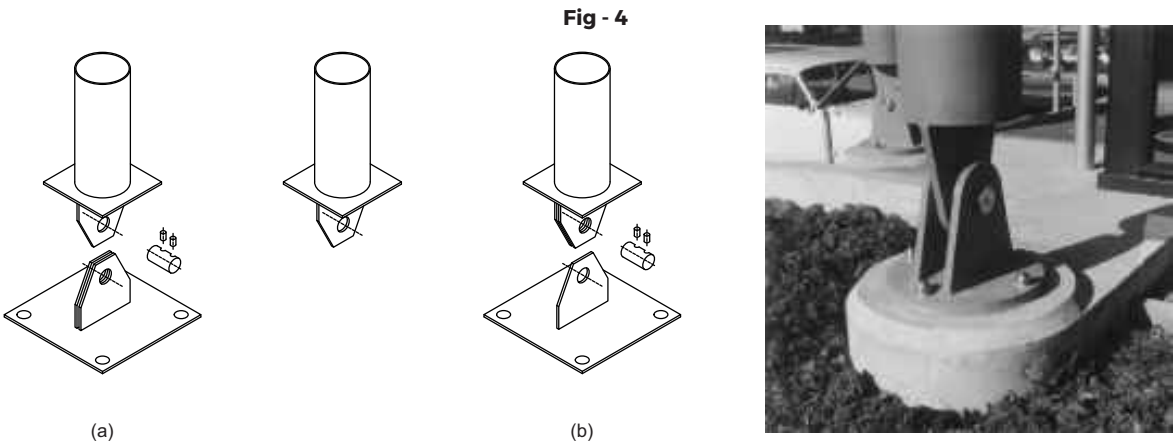
REINFORCEMENT OF CONNECTIONS

For maximum resistance of the members, it is usually more efficient to select larger tubular sections with thin walls. However, when designing the connections, it is more advantageous to use chord members that are thicker and smaller in section (provided that they are not smaller than the bracing members). Therefore, a compromise is necessary for overall design and fabrication efficiency. In some cases, connections may have to be strengthened locally to resist the applied forces, if it is not possible to increase the member size or thickness. This can be achieved by welding plates to the chord face (see Figure 3(a)). It should also be noted that overlaps will also increase the connection resistance, especially for RHS members. When a third member is required at the intersection, a 'T' piece can also be used (see Figure 3(b)). Other non-standard stiffened K connections can be used to increase the load capacity of the connection, as illustrated in Figure 3(c&d).



COLUMN BASES

Bases to tubular columns take two basic forms: pinned and rigid (or moment-resisting). The details employed reflect the transfer of forces and moments. A genuine pinned connection can be achieved by a single pin from a projecting plate, as shown in Figure 4.

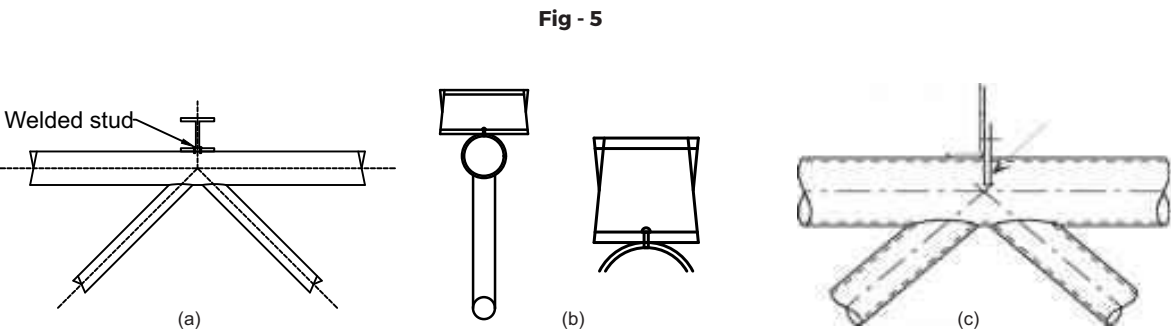


Some examples of tubular connections with pinned ends

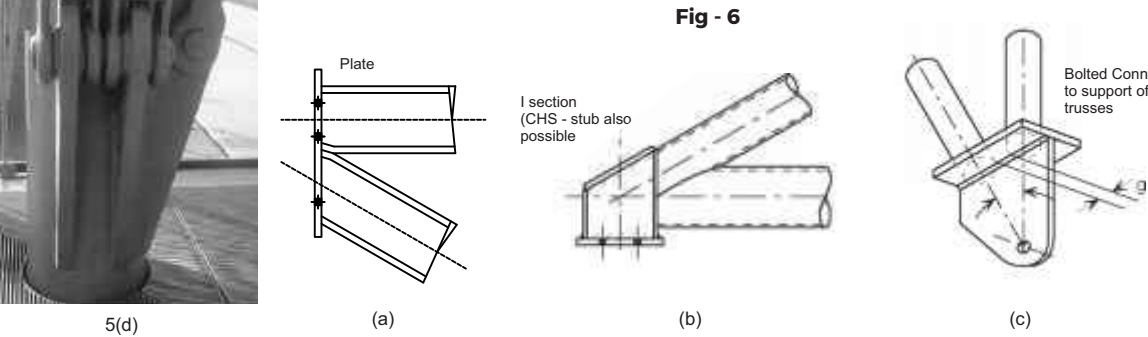
WELDED FINNS

Fins or brackets may be welded to the side of CHS or SHS/RHS sections to provide direct attachment of secondary members such as purlins (see Figure 5). Connections of this type require careful design because of the possible local distortion of the walls of larger hollow sections. Alternatively, welded threaded studs with extended washers may be used to attach the purlins to the section.

The attachment of tension-ties or rod-bracing members requires similar details. High local forces from ties may also be transferred by 'patch-type' connections, which may be profiled around the circular section so that weld forces are transferred smoothly to the walls of the section. Multiple welded fin connections have been used successfully on a number of major projects, such as at the column bases at the Cologne Airport terminal, as shown in Figure 5(d)



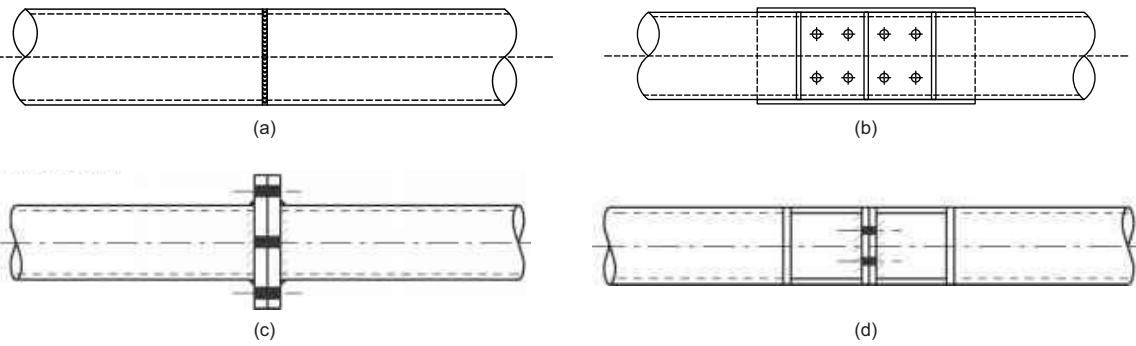
Bolted connections are desirable for site assembly, and large welded sub-assemblies that are prefabricated and bolted together on site at suitable locations. The practical aspects of installation should be considered in the design process. For example, Figure 6 shows



TUBULAR SPLICE CONNECTION

FLANGE PLATES (Figure - 7) are simple to make but are not aesthetically pleasing. They are suitable for compression but are less efficient for tension because of bending in the end plate, requiring thicker plates and more bolts. Fillet welding around the section could cause distortion of thin flange plates.

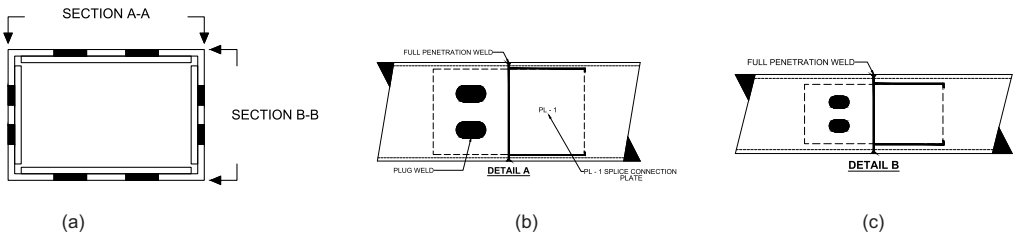
Fig - 7



Moment-resisting connection is achieved by a welded end- plate with four or more bolts. The thickness of the end plate depends on the moment to be transferred

SPLICE CONNECTION WITH PLUG WELDING

Fig - 8



Interesting details can be created using cast iron or cast steel nodes in a pinned connection



Fig - 9

TUBULAR TRUSS

Connections in trusses and lattice construction Figure - 10 Two-dimensional trusses

Tubular sections are commonly used in long-span trusses for reasons of aesthetics and structural efficiency. Generally, CHS members are used for both the chords and bracing members, and a typical welded connection is illustrated in Figure - 10 However, the top and bottom chords may use RHS rather than CHS members in order to facilitate

Fig - 10



The connection with the roof or floor slab and other cross-members

For the connection of tubular trusses to RHS columns, typical bolted details are shown in Figure 11. High shear-forces may require the use of more bolts than shown. The sharing of load between the upper and lower chords in the connection depends on the presence of a vertical bracing member at the end of the truss. In the detail of Figure 11(a), the upper connection will resist all of the applied shear-force. In Figure 11(b), the upper and lower parts of the connections may be assumed to resist equal shear-force.

Fig - 11

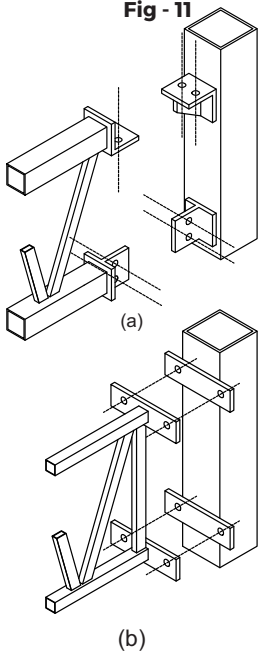
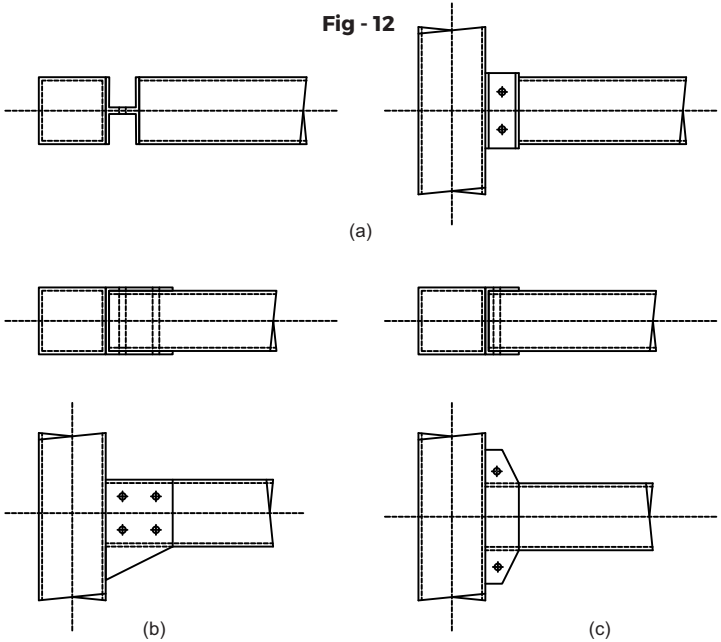


Figure 11(a&b) - Truss to SHS/RHS column connection

Fig - 12

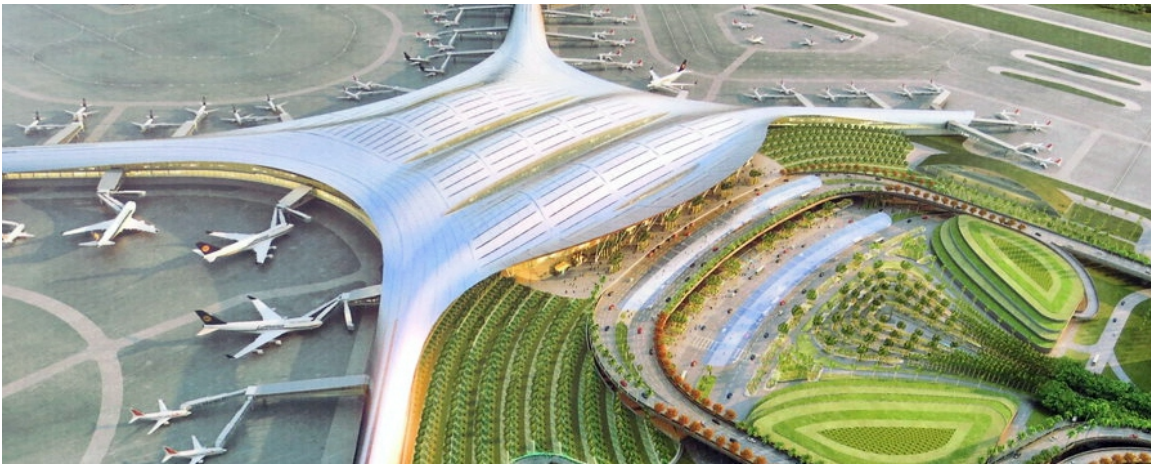


Typical connection of an RHS beam to an RHS column a,b&c

Figure 12 shows other typical connections of an RHS beam to an RHS column. For lightly loaded connections, the T-section shown in Figure 12(a) may be replaced with a fin plate. Where through bolting is used (as in Figure 12(b) and Figure 12(c)), spacer tubes

Case Study

PROJECT - KEMPEGOWDA INTERNATIONAL AIRPORT, BENGALURU
CONTRACTOR - L&T
SUB CONTRACTOR - M/S. YONGNAM ENGINEERING INDIA PVT LTD
CLIENT - GMR/BIAL
YEAR - 2019



ABOUT THE PROJECT

Kempegowda International Airport, the third-biggest airport in India, is constructing a garden terminal called T2 to accommodate the increasing passenger traffic. The terminal will feature trees, small gardens and ponds with local species of plants. It is expected to serve approximately 25 million passengers a year. Operated by Bengaluru International Airport Limited (BIAL), it is claimed to be India's first greenfield airport terminal to be built under a public-private partnership. Construction of the terminal began in 2019. With the expected completion of phase one works in March 2021.

CHALLENGE

M/S. Yongnam Engineering Sub - Contractor for Bengaluru Airport had a requirement of hollow sections 350 mm x 250 mm X 10 mm from BIAL's preferred make list suppliers for constructing the Terminal building.

The preferred make list suppliers were not able to manufacture the required sizes considering they had the capability and capacity constraints

Yongnam Engineering had almost decided to import these sizes from China with a 60 day lead time which would have increased costs.

SOLUTION

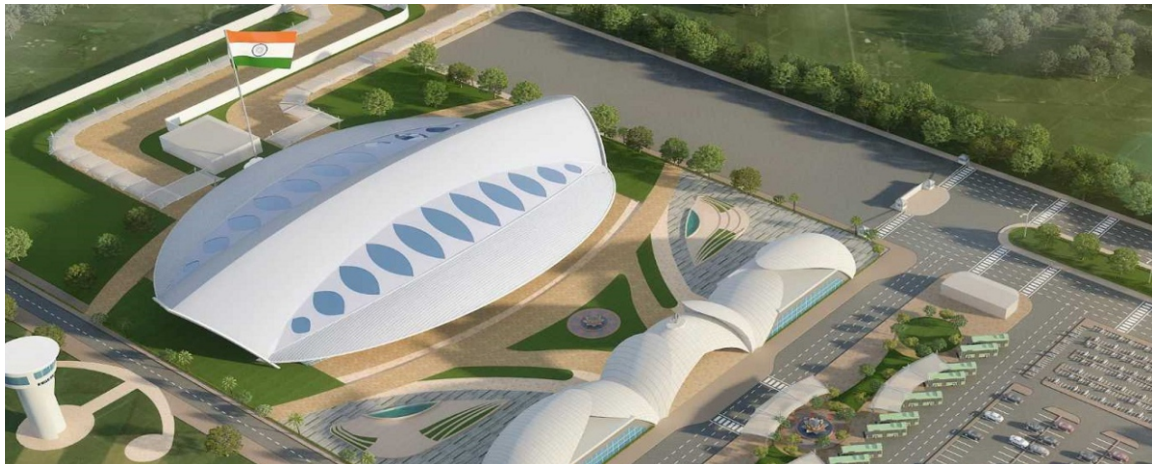
The contractor approached APL Apollo Tubes Ltd, for supplying Hollow Sections of size 350 mm x 250 mm x 10 mm. APL APOLLO was able to provide the required sizes and quantity within 7 days of issuing the purchase order.

RESULT AND CONCLUSION

APL Apollo has the technology to service customized Sizes in Minimum Lead Time. This was possible because of DFT (Direct Forming Technology) which is connected only with APL APOLLO in India. This technology helps in giving customized size more exceptional flexibility and minimum lead time.

Case Study

PROJECT - KARTARPUR CORRIDOR PASSANGER TERMINAL AT DERA BABA NANAK, PUNJAB
CONSULTANT - CREATIVE GROUP
CONTRACTOR - SHAPORJI PALLONJI & CO. PVT. LTD.
YEAR - 2019



ABOUT THE PROJECT

Kartarpur Corridor has been one of our most prestigious projects, as it is a gateway for pilgrims to visit the Gurudwara Kartarpur Sahib in Pakistan. The project was under the limelight of different international and national media houses as this project has been a stepping stone towards improving ties between the two countries.

CHALLENGE

The project was scheduled to be inaugurated as per the defined timeline. But the contractors of the project, were running behind time with their approved vendors for supplying structural pipes & tubes. However, approved vendors were unable to cater to the demand due to shorter lead time.

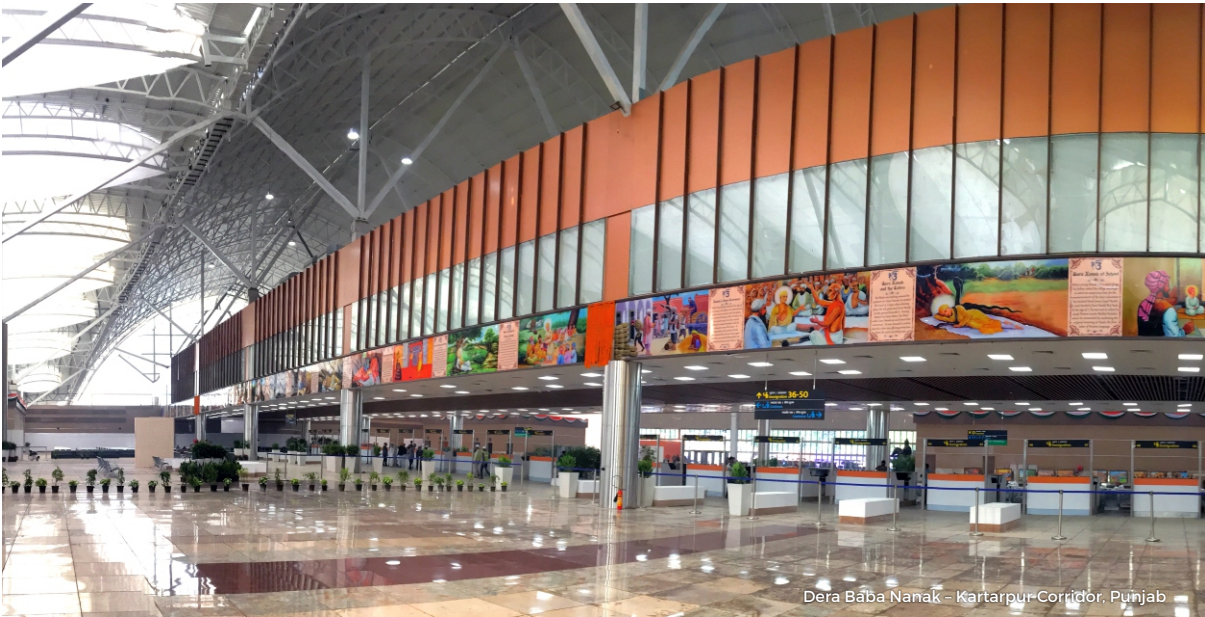
SOLUTION

Creative Group & Shapoorji Pallonji & Co. Pvt. Ltd. approached APL Apollo Tubes and requested to supply the required structural pipes & tubes in the given time frame. The principals to the project - Land Port Authority of India, a part of Ministry of Home Affairs, were approached by APL Apollo along with Creative Group & Shapoorji Pallonji & Co. to get the approval. The LOI was provided by Shapoorji Pallonji & Co. itself. A presentation was made by APL Apollo to the concerned authorities which highlighted the manufacturing capabilities along with the credentials of the company.

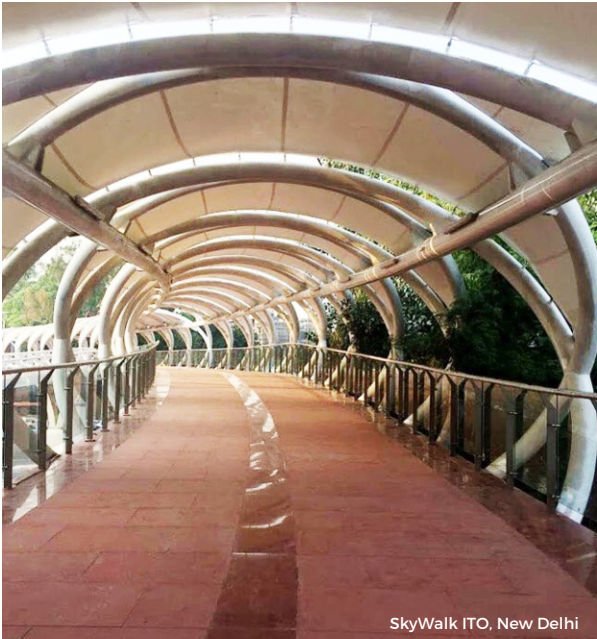
RESULTS AND CONCLUSION

APL Apollo was given a pre-approval on the 24th July 2019 & an LOI on the 26th July 2019 to supply structural pipes. APL Apollo started dispatches from the 27th July 2019 and had supplied approximately 500 Tons out of the total requirement of 615 Tons within 7 days of LOI. With APL Apollo Tube's faster delivery, pan India flexibility on sizes and proximity of plant locations, the company was able to complete the project with great precision.

* Photos are for representation purpose only
* Terms & conditions apply



Dera Baba Nanak - Kartarpur Corridor, Punjab



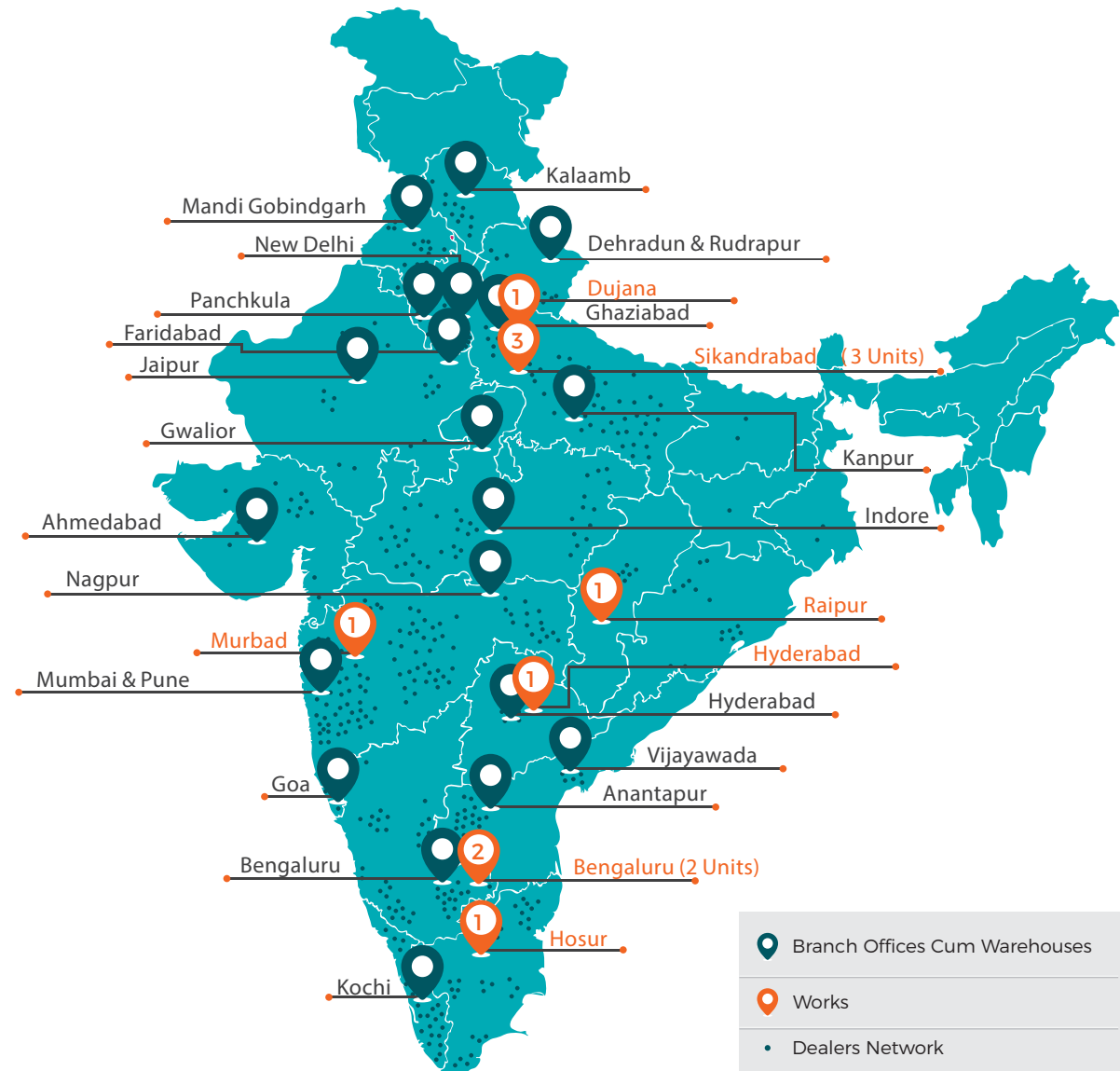
SkyWalk ITO, New Delhi



NSP Metro Station DMRC New Delhi



ITPO Pragati Maidan, New Delhi



No. 1 IN INDIA	10 MANUFACTURING PLANTS	20+ EXPORTING TO COUNTRIES GLOBALLY
29 SALES OFFICES	800+ DEALERS & DISTRIBUTORS	1000+ PRODUCT PORTFOLIO
2000 TOWNS & CITIES	1 LAKH+ RETAILERS & FABRICATORS	25.5 LAKH TONNES PRODUCTION