

# NATURE'S ARCHITECT AMAZING DESIGNS

The **Weaver Bird's** nest is an astonishingly amazing simple.

\* Please launch the augmented reality on the Tata Structural entire page to play the video

## TATA STRUCTURA 355 PRODUCT RANGE MECHANICAL PROPERTIES

Section Type	Grade	Mechanical Properties		Outside Dimension	Dimensional Tolerance					
		YST Mpa	UTS Mpa		% Elongation <25.4 mm >25.4 mm	Thickness	Squareness	Corner Radius	Weight	
									Individual Lengths	On Lot of 10MT
*RHS/SHS IS:4923	YST 355	355	490	8	10	+/- 10%	90 deg +/-2deg	3t max	10% -8%	+/- 7.5%
CHS IS : 1161	YST 355	355	490	8	10	+ no limit/ -10%	NA	NA	L -10% M & H +/-10%	L -7.5% M & H /-7.5%

\* Incorporation of YST 355 in IS 4923 is underway

Length

6.0m +/- 0.05 m. Customized length ranging from 6 m to 11 m may be supplied

Straightness

Minimum 1:200\* of any length measured along the centre line(mill straightened condition) unless otherwise specifically arranged

Twist Tolerance

Maximum 2 mm +/- mm/m length measured relative vertical shift of any adjacent corner of the section measured by keeping one side on flat surface

End Finish

Plain ended - mechanically sheared, mill-cut finish without further machining

### SQUARE HOLLOW SECTION - Product Range

B	B	2	2.6	2.9
25	25			
32	32			
40	40			
50	50			
60	60			
72	72			
80	80			
91.5	91.5			
100	100			

Size

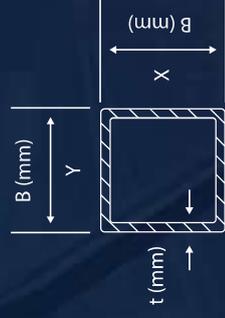
113.5  
113.5

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Properties of Square hollow sections

Section Properties



B (mm)	B (mm)	T (mm)	Area (cm <sup>2</sup> )	Weight (Kg/m)	Ixx (cm <sup>4</sup> )	Zx (cm <sup>3</sup> )	Rx (cm)	Iyy (cm <sup>4</sup> )	Zy (cm <sup>3</sup> )	Ry (cm)
25	25	2	1.74	1.36	1.48	1.19	0.92	1.48	1.19	0.92
25	25	2.6	2.16	1.69	1.72	1.38	0.89	1.72	1.38	0.89
25	25	3.2	2.53	1.98	1.89	1.51	0.86	1.89	1.51	0.86
32	32	2	2.30	1.80	3.36	2.10	1.21	3.36	2.10	1.21
32	32	2.6	2.88	2.26	4.02	2.51	1.18	4.02	2.51	1.18
32	32	3.2	3.42	2.69	4.54	2.83	1.15	4.54	2.83	1.15
40	40	2	2.94	2.31	6.94	3.47	1.54	6.94	3.47	1.54
40	40	2.6	3.72	2.92	8.45	4.22	1.51	8.45	4.22	1.51
40	40	3.2	4.45	3.49	9.72	4.86	1.48	9.72	4.86	1.48
40	40	4	5.35	4.20	11.07	5.54	1.44	11.07	5.54	1.44
50	50	2	3.74	2.93	14.15	5.66	1.95	14.15	5.66	1.95
50	50	2.6	4.76	3.73	17.47	6.99	1.92	17.47	6.99	1.92
50	50	2.9	5.25	4.12	18.98	7.59	1.90	18.98	7.59	1.90
50	50	3.6	6.35	4.98	22.15	8.86	1.87	22.15	8.86	1.87
50	50	4.5	7.67	6.02	25.50	10.20	1.82	25.50	10.20	1.82
60	60	2	4.54	3.56	25.14	8.38	2.35	25.14	8.38	2.35

B (mm)	B (mm)	T (mm)	Area (cm <sup>2</sup> )
91.5	91.5	2.6	9.07
91.5	91.5	3.6	12.32
91.5	91.5	4.5	15.14
100	100	2.6	9.96
100	100	4	14.95
100	100	5	18.36
100	100	6	21.63
113.5	113.5	2.9	12.61
113.5	113.5	4.8	20.28
113.5	113.5	5.4	22.60
132	132	2.9	14.76
132	132	4.8	23.83
132	132	5.4	26.59
150	150	3.6	20.75
150	150	4	22.95
150	150	5	26.32

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## RECTANGULAR HOLLOW SECTION - Product Range

Thickness - t (mm)

B	B	2	2.3	2.6	2.9	3.2	3.6	4	4.5	4.8	5	5.4	6	8
50	25													
60	40													
66	33													
80	40													
96	48													
122	61													
145	82													
172	92													
200	100													
240	120													

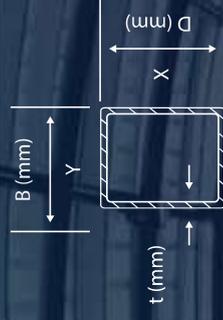
## Properties of Rectangular hollow sections

D (mm)	B (mm)	T (mm)	Area (cm <sup>2</sup> )	Weight (Kg /m)	I <sub>x</sub> (cm <sup>4</sup> )
50	25	2	2.74	2.15	8.1
50	25	2.6	3.46	2.71	10.1
50	25	3.2	4.13	3.24	11.1
60	40	2.6	4.76	3.73	22.1
60	40	2.9	5.25	4.12	24.1
60	40	3.6	6.35	4.98	28.1
66	33	2.6	4.70	3.69	25.1
66	33	2.9	5.19	4.07	27.1
66	33	3.6	6.28	4.93	31.1
80	40	2	4.54	3.56	37.1
80	40	2.6	5.80	4.55	46.1
80	40	3.2	7.01	5.50	54.1
80	40	4	8.55	6.71	64.1
96	48	2	5.50	4.31	66.1

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## Properties of Rectangular hollow sections



## Section Properties

D (mm)	B (mm)	T (mm)	Area (cm <sup>2</sup> )	Weight (Kg/m)	I <sub>xx</sub> (cm <sup>4</sup> )	Z <sub>x</sub> (cm <sup>3</sup> )	R <sub>x</sub> (cm)	I <sub>yy</sub> (cm <sup>4</sup> )	Z <sub>y</sub> (cm <sup>3</sup> )	R <sub>y</sub> (cm)	J (cm <sup>4</sup> )	B (cm <sup>3</sup> )
172	92	2.6	13.28	10.43	531.59	61.81	6.33	203.49	44.24	3.91		
172	92	3.6	18.16	14.25	713.91	83.01	6.27	271.80	59.09	3.87		
172	92	4.8	23.83	18.70	917.06	106.64	6.20	346.89	75.41	3.82	826.04	128.85
172	92	5.4	26.59	20.88	1012.39	117.72	6.17	381.72	82.98	3.79	918.1	142.04
200	100	3.6	20.75	16.29	1091.42	109.14	7.25	374.53	74.91	4.25		
200	100	4	22.95	18.01	1199.64	119.96	7.23	410.76	82.15	4.23	991.47	141.46
200	100	5	28.36	22.26	1459.16	145.92	7.17	496.92	99.38	4.19	1216.96	171.53
200	100	6	33.63	26.40	1703.17	170.32	7.12	576.89	115.38	4.14	1434.03	199.69
200	100	8	43.79	34.37	2146.00	214.60	7.00	719.15	143.83	4.05	1843.96	250.69
240	120	4	27.75	21.78	2110.63	175.89	8.72	725.33	120.89	5.11	1736.39	208.03
240	120	5	34.36	26.97	2579.52	214.96	8.67	882.44	147.07	5.07	2138.48	253.55
240	120	6	40.83	32.05	3025.71	252.14	8.61	1030.40	171.73	5.02	2528.39	296.7
240	120	8	53.39	41.91	3851.50	320.96	8.49	1299.89	216.65	4.93	3272.9	376.29
300	150	5	43.36	34.03	5152.90	343.53	10.90	1770.82	236.11	6.39		

## CIRCULAR HOLLOW SECTION

- Product Range

NB	OD	2	2.6
25	33.7		
32	42.4		
40	48.3		
50	60.3		
65	76.1		
80	88.9		
100	114.3		
125	139.7		
150	165.1		

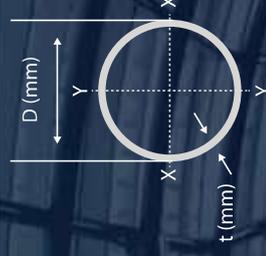
Size

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Properties of Circular hollow sections

Section Properties



NB (mm)	D (mm)	T (mm)	Area (cm <sup>2</sup> )	Weight (Kg/m)	Ixx (cm <sup>4</sup> )	Zx (cm <sup>3</sup> )	Rx (cm)	Outer Surface Area/m cm <sup>2</sup> /m
25	33.7	2	1.99	1.56	2.51	1.49	1.12	1058.716724
	33.7	2.6	2.54	1.99	3.09	1.84	1.10	
	33.7	3.2	3.07	2.41	3.60	2.14	1.08	
32	42.4	2	2.54	1.99	5.19	2.45	1.43	1332.035285
	42.4	2.6	3.25	2.55	6.46	3.05	1.41	
	42.4	3.2	3.94	3.09	7.62	3.59	1.39	
40	48.3	2	2.91	2.28	7.81	3.23	1.64	
	48.3	2.9	4.14	3.25	10.70	4.43	1.61	
	48.3	3.2	4.53	3.56	11.59	4.80	1.60	
50	48.3	4	5.57	4.37	13.77	5.70	1.57	
	60.3	2	3.66	2.88	15.58	5.17	2.06	
	60.3	2.9	5.23	4.11	21.59	7.16	2.03	
200	60.3	3.6	6.41	5.03	25.87	8.58	2.01	
	60.3	4.5	7.89	6.19	30.90	10.25	1.98	
	114.3	2.6	9.12	7.00	36.93	11.92	1.95	
100	114.3	3.6	12.52	9.70	51.06	16.28	1.91	
	114.3	4.5	15.52	11.90	63.21	19.11	1.87	
	114.3	5.4	18.47	14.10	74.36	21.94	1.83	
125	139.7	3.2	13.72	10.40	85.51	23.81	1.78	
	139.7	4.5	19.11	12.60	106.66	27.64	1.74	
	139.7	5.4	22.78	14.80	126.81	31.47	1.70	
150	165.1	3.2	16.28	12.60	106.66	27.64	1.68	
	165.1	4.5	22.70	14.80	126.81	31.47	1.64	
	165.1	5.4	27.09	17.00	146.96	35.30	1.60	
219.1	219.1	4	27.03	20.20	167.11	39.13	1.57	
	219.1	4.8	32.32	23.40	197.26	46.96	1.53	
	219.1	6.3	42.12	30.60	267.41	62.79	1.49	