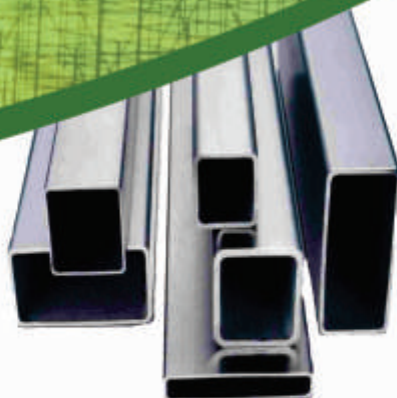




# PURVA

— Defining Structures —

## Steel Pipes & Tubes



An ISO 9001:2008 Company

MANUFACTURERS : STEEL PIPES AND TUBES



## Introduction

Shri Shiv Kumar Purva is a visionary entrepreneur and the man behind the establishment and phenomenal success of Purva Group in the field of Iron and Steel Business. Purva Group is a professionally managed group, which was established in the year 1993 in Bangalore to provide all items of Iron and Steel Products under one roof at Most Competitive Prices with best service. Purva Group Comprises of Two Operating Companies Each of these Enterprises operates independently with the registered office situated at No.193, "Shiv Sadan", B. Narayanapura Outer Ring Road, Bangalore – 560016.

### Shiva Ferric Private Limited (SFPL)

Trading of All types of Iron and Steel Products which Includes HR Sheets / Plates and Coils, CR Sheets & Coils, Structural Steels like Angles, Channels, Beams, T-Angles TMT Bars etc.

- SFPL is Authorised Distributors of
  - ▶ TATA Steels Limited for Hot Rolled Steel range of products under the Brand name "TATA – ASTRUM"
- SAIL - Steel Authority of India Limited
  - ▶ Hot Rolled Steel Coil / Sheets / Plates
  - ▶ Cold Rolled Steel Coils / Sheets,
  - ▶ Structural Steels like Beams, Joists Channels, Angles etc.,
  - ▶ TMT Bars
  - ▶ GP and GC Sheets
- RINL – Vishakhapatnam Steel Plant
  - ▶ Structural Steels like Beams, Joists Channels, Angles, Bars and Rods etc.
  - ▶ TMT Bars
- Products of All Major Re-Rollers in India like SKS Ispat, Monnet Ispat, Vandana Steels Mahamaya Ispat, Topworth Steels etc.

### Purva Metal Sections Private Limited (PMSPL)

An ISO 9001:2008 Certified Company having Manufacturing facility at Malur, Near Bangalore Karnataka – Manufacturer of High Frequency Induction Welded (ERW) Steel Pipes and Tubes of following BIS Specifications (ISI Mark).

- IS 1239 : 2004 – Black Steel Tubes for use (Part I) in Water, Non – Hazardous Gas, Steam and Air Lines.
  - IS 3601: 2006 – Steel Tubes for Mechanical and General Engineering Purposes.
  - IS 9295: 1983 – Steel Tubes for Idlers for Belt Conveyors.
  - IS 3074: 2005 – Steel Tubes for Automotive Purposes
  - IS 1161: 2014 – Steel Tubes for Structural Purposes (CHS)
  - IS 4923: 1997 – Hollow Steel Sections for Structural Use (SHS and RHS)
- Apart above standards PMSPL Can Supply
- As Per International Standards.
  - As Per Drawing of Customers for special Shapes Closed Sections.

Raw Materials Sourcing :



Shape	Minimum Size in mm	Maximum Size in mm	Thickness Range In mm
Round (CHS)	8.00	220 mm	0.50 to 8.00
Square (SHS)	10 x 10	180 x 180	0.50 to 8.00
Rectangle (RHS)	12 x 6	240 x 120	0.50 to 8.00



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## Manufacturing Process

ERW Steel Pipes & Tubes are manufactured by High frequency induction welding process from Hot Rolled / Cold Rolled Steel Coils produced at the Steel Plants. The Raw materials to Manufacture ERW Steel Pipes & Tubes are procured in Wide Coils form, which are tested for chemical and mechanical properties. After testing of coils, subject to quality acceptance, these wide coils are slit in slitting line to the desired narrow width roughly equal to the perimeter of the Steel Pipes and Tubes Sizes.

The Narrow Coils passes through a sequence of pre aligned forming and fin rolls of high profile hardened and tempered top and bottom rolls. The Strip Gradually attains the circular shape in various stages, which will be getting welded by High frequency Induction Welding. There is no extra filler material used for welding.

The outside bead is trimmed off with a tungsten carbide tool in all cases. The welded pipe passed through a coolant chamber and sized by the sequence of rolls through sizing Stands. The pipes will be cut off automatically in flying Cold Saw machine as per the set length. This Pipes & Tubes are transferred for quality inspections and testing like, Hydro Testing machines Universal testing machine for testing quality of welding, Mechanical Testing of Pipes etc, and finally these products are bundled for dispatch / storage.

### Testing and Quality Control Facilities

Steel Pipes and Tubes products are tested in accordance with the Indian Standard Specification No. IS:1239, IS:3074, IS:1161, IS:3601, IS:4923, IS:9295. The tests are comprised of chemical analysis of the product, determination of tensile strength etc.

During production, online Eddy current testing and visual inspection is carried out for surface defects, Dimensional accuracy, Straightness & Twists, Lengths. At regular intervals, Sample pieces are taken as per Specifications to carry out following tests

Thickness

Dimensions

Weight (Mass)

Tensile Test

Bend Test

Flattening Test

Crushing Test

Drift Expansion Test

Individual pipes are finally taken for hydro testing, visually inspected for the parameters specified in the specification before dispatch / storing.



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MANUFACTURERS : STEEL PIPES AND TUBES





# Product Range of Precision Tubes

## Precision Tubes (CR & GP) ROUND TUBES (CHS) in CR and GP

Outer Dia Size in mm	Thickness in mm												Weight Per Mtr.
	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.60	1.80	2.00	2.20	2.50	
8.00	0.092	0.109	0.126	0.142	0.158	0.173	0.201						
9.52	0.111	0.132	0.152	0.172	0.191	0.210	0.246	0.313					
12.00	0.142	0.169	0.207	0.221	0.246	0.271	0.320	0.410	0.453				
12.70	0.150	0.179	0.207	0.235	0.262	0.289	0.340	0.438	0.484	0.528			
15.87	0.190	0.226	0.262	0.297	0.332	0.367	0.434	0.563	0.625	0.684			
19.05	0.229	0.273	0.317	0.360	0.403	0.445	0.528	0.689	0.766	0.841			
22.23	0.268	0.320	0.372	0.423	0.473	0.524	0.622	0.814	0.907	0.998			
25.40	0.307	0.367	0.426	0.485	0.544	0.602	0.716	0.939	1.048	1.154	1.259	1.412	1.561
31.75	0.385	0.461	0.536	0.611	0.685	0.758	0.904	1.190	1.330	1.467	1.603	1.803	1.999
38.10		0.555	0.646	0.736	0.826	0.915	1.092	1.440	1.611	1.781	1.948	2.195	2.438
48.30					1.052	1.166	1.394	1.843	2.064	2.284	2.501	2.824	3.142
50.80							1.468	1.941	2.175	2.407	2.637	2.978	3.315
60.30								2.316	2.597	2.876	3.152	3.564	3.971
63.50								2.442	2.739	3.033	3.326	3.761	4.191
76.20								2.944	3.303	3.660	4.015	4.544	5.068
88.90								3.445	3.866	4.286	4.704	5.327	5.945
101.60								3.946	4.430	4.913	5.393	6.110	6.822
127.00									5.558	6.165	6.771	7.676	8.576

## SQUARE HOLLOW SECTIONS (SHS) in CR and GP Square

in mm	Thickness in mm												
	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.60	1.80	2.00	2.20	2.50	2.80
7.5 x 7.5	0.111	0.132	0.152	0.172	0.191	0.210	0.246	0.313					
10 x 10	0.150	0.179	0.207	0.235	0.262	0.289	0.340	0.438	0.484				
12.5 x 12.5	0.190	0.226	0.262	0.297	0.332	0.367	0.434	0.563	0.625	0.684			
15 x 15	0.229	0.273	0.317	0.360	0.403	0.445	0.528	0.689	0.766	0.841			
19 x 19	0.292	0.348	0.405	0.461	0.516	0.571	0.679	0.890	0.992	1.093			
20 x 20	0.307	0.367	0.426	0.485	0.544	0.602	0.716	0.939	1.048	1.154	1.259	1.412	1.561
25 x 25	0.385	0.461	0.536	0.611	0.685	0.758	0.904	1.190	1.330	1.467	1.603	1.803	1.999
30 x 30		0.555	0.646	0.736	0.826	0.915	1.092	1.440	1.611	1.781	1.948	2.195	2.438
38 x 38					1.052	1.166	1.394	1.843	2.064	2.284	2.501	2.824	3.142
40 x 40							1.468	1.941	2.175	2.407	2.637	2.978	3.315
50 x 50								2.442	2.739	3.033	3.326	3.761	4.191
60 x 60								2.944	3.303	3.660	4.015	4.544	5.068
72 x 72								3.445	3.866	4.286	4.704	5.327	5.945
80 x 80								3.946	4.430	4.913	5.393	6.110	6.822
100 x 100									5.558	6.165	6.771	7.676	8.576

## RECTANGLE HOLLOW SECTIONS (RHS) in CR and GP Rectangle

in mm	Thickness in mm												
	0.50	0.60	0.70	0.80	0.90	1.00	1.20	1.60	1.80	2.00	2.20	2.50	2.80
10 x 5	0.111	0.132	0.152	0.172	0.191	0.210	0.246	0.313					
13 x 7	0.150	0.179	0.207	0.235	0.262	0.289	0.340	0.438	0.484				
15 x 10	0.190	0.226	0.262	0.297	0.332	0.367	0.434	0.563	0.625				
25 x 15	0.307	0.367	0.426	0.485	0.544	0.602	0.716	0.939	1.048	1.154	1.259	1.412	1.561
30 x 10	0.307	0.367	0.426	0.485	0.544	0.602	0.716	0.939	1.048	1.154	1.259	1.412	1.561
30 x 20	0.385	0.461	0.536	0.611	0.685	0.758	0.904	1.190	1.330	1.467	1.603	1.803	1.999
35 x 25		0.555	0.646	0.736	0.826	0.915	1.092	1.440	1.611	1.781	1.948	2.195	2.438
40 x 20		0.555	0.646	0.736	0.826	0.915	1.092	1.440	1.611	1.781	1.948	2.195	2.438
50 x 25					1.052	1.166	1.394	1.843	2.064	2.284	2.501	2.824	3.142
50 x 30							1.468	1.941	2.175	2.407	2.637	2.978	3.315
60 x 20							1.468	1.941	2.175	2.407	2.637	2.978	3.315
60 x 40								2.442	2.739	3.033	3.326	3.761	4.191
75 x 25								2.442	2.739	3.033	3.326	3.761	4.191
80 x 40								2.944	3.303	3.660	4.015	4.544	5.068
96 x 48								3.445	3.866	4.286	4.704	5.327	5.945
100 x 20								2.944	3.303	3.660	4.015	4.544	5.068



# PURVA

Defining Structures

## Steel Pipes & Tubes

# Specification for STEEL TUBES FOR STRUCTURAL PURPOSES

Conforming to IS 4923 / 1997

## Dimensions and Properties of Square Hollow Sections

Designation in mm	Thickness in mm	Depth or width in mm	Weight in kg/ meter	Area of Section cm <sup>2</sup>	Moment of Inertia cm <sup>4</sup>	Radius of Gyration cm	Elastic Modulus cm <sup>3</sup>	Plastic Modulus cm <sup>3</sup>
25x25	2.6	25	1.69	2.16	1.72	0.89	1.38	1.76
	3.2	25	1.98	2.53	1.89	0.86	1.51	1.98
30x30	2.6	30	2.10	2.68	3.23	1.10	2.15	2.68
	3.2	30	2.49	3.17	3.62	1.07	2.41	3.08
	4	30	2.94	3.75	3.97	1.03	2.64	3.50
32x32	2.6	32	2.26	2.88	4.02	1.18	2.51	3.11
	3.2	32	2.69	3.42	4.54	1.15	2.84	3.59
	4	32	3.19	4.07	5.02	1.11	3.14	4.11
38x38	2.6	38	2.75	3.51	7.14	1.43	3.76	4.57
	2.9	38	3.03	3.86	7.68	1.41	4.04	4.97
	3.2	38	3.29	4.19	8.18	1.40	4.30	5.34
	3.6	38	3.63	4.62	8.76	1.38	4.61	5.80
	4	38	3.95	5.03	9.26	1.36	4.87	6.22
40x40	2.6	40	2.92	3.72	8.45	1.51	4.22	5.12
	3.2	40	3.49	4.45	9.72	1.48	4.86	6.01
	3.6	40	3.85	4.91	10.45	1.46	5.22	6.53
	4	40	4.20	5.35	11.07	1.44	5.54	7.01
49.5x49.5	2.9	49.5	4.07	5.19	18.37	1.88	7.42	8.93
	3.6	49.5	4.93	6.28	21.42	1.85	8.66	10.60
	4.5	49.5	5.95	7.58	24.64	1.80	9.96	12.47
72x72	3.2	72	6.71	8.54	66.32	2.79	18.42	21.80
	4	72	8.22	10.47	79.03	2.75	21.95	26.32
	4.8	72	9.66	12.31	90.31	2.71	25.09	30.49
91.5x91.5	3.6	91.5	9.67	12.32	156.49	3.56	34.21	40.24
	4.5	91.5	11.88	15.14	187.57	3.52	41.00	48.79
	5.4	91.5	14.01	17.85	215.68	3.48	47.14	56.77
100x100	4	100	11.73	14.95	226.35	3.89	45.27	53.30
	5	100	14.41	18.36	271.10	3.84	54.22	64.59
	6	100	16.98	21.63	311.47	3.79	62.29	75.10
113.5x113.5	4.5	113.5	14.99	19.10	372.88	4.42	65.71	77.33
	4.8	113.5	15.92	20.28	393.31	4.40	69.30	81.81
	5.4	113.5	17.74	22.60	432.58	4.38	76.23	90.55
	6	113.5	19.53	24.87	469.81	4.35	82.79	98.96
132x132	4.8	132	18.71	23.83	634.39	5.16	96.12	112.69
	5.4	132	20.88	26.59	700.11	5.13	106.08	125.02
	6	132	23.01	29.31	762.98	5.10	115.60	136.98
150x150	5	150	22.26	28.36	982.12	5.89	130.95	152.98
	6	150	26.40	33.63	1145.91	5.84	152.79	179.88
180x180	4	180	21.90	27.90	1434.00	7.17	159.00	184.00
	5	180	27.20	34.60	1755.00	7.12	195.00	226.00
	6	180	32.05	40.83	2036.00	7.06	226.00	280.00
	8	180	42.50	54.10	2633.00	6.98	293.00	346.00

*"We have always  
pursued the critical path with  
determined deliverables"*



An ISO 9001:2008 Company

MANUFACTURERS : STEEL PIPES AND TUBES





# Specification for STEEL TUBES FOR STRUCTURAL PURPOSES

Conforming to IS 4923 / 1997

## Dimensions and Properties of Rectangular Hollow Sections

Designation	Thickness	Depth of	Width of	Weight	Area of	Moment of		Radius of		Elastic Modulus		Plastic Modulus	
		Section	Section			Inertia about	Gyration about	About	About				
in mm	in mm	D	B	in	cm <sup>2</sup>	X-X	Y-Y	X-X	Y-Y	X-X	Y-Y	X-X	Y-Y
		in mm	in mm	kg/ meter		cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>
50x25	2.9	50	25	2.98	3.80	10.93	3.60	1.70	0.97	4.37	2.88	5.72	3.48
	3.2	50	25	3.24	4.13	11.63	3.80	1.68	0.96	4.65	3.04	6.14	3.73
60x40	2.9	60	40	4.12	5.25	24.74	13.11	2.17	1.58	8.25	6.56	10.25	7.73
	2.9	66	33	4.07	5.19	27.33	9.12	2.29	1.33	8.28	5.53	10.59	6.49
66x33	3.6	66	33	4.93	6.28	31.87	10.52	2.25	1.29	9.66	6.37	12.56	7.66
	4.5	66	33	5.95	7.58	36.64	11.93	2.20	1.25	11.10	7.23	14.77	8.94
80x40	2.9	80	40	5.03	6.41	50.87	17.11	2.82	1.63	12.72	8.56	16.07	9.88
	3.2	80	40	5.50	7.01	54.94	18.41	2.80	1.62	13.74	9.21	17.46	10.72
	4	80	40	6.71	8.55	64.79	21.49	2.75	1.59	16.20	10.74	20.91	12.77
96x48	3.2	96	48	6.71	8.54	98.61	33.28	3.40	1.97	20.54	13.87	25.85	15.91
	4	96	48	8.22	10.47	117.54	39.32	3.55	1.94	24.49	16.30	31.21	19.14
	4.8	96	48	9.66	12.31	134.35	44.55	3.30	1.90	27.99	18.56	36.13	22.08
122x61	3.6	122	61	9.67	12.32	232.61	78.83	4.34	2.35	38.13	25.84	47.71	29.42
	4.5	122	61	11.88	15.14	278.94	93.78	4.29	2.49	45.73	30.75	57.85	35.56
	5.4	122	61	14.01	17.85	320.83	107.03	4.24	2.45	52.60	35.09	67.29	41.22
145x82	4.8	145	82	15.92	20.28	555.16	228.50	5.23	3.36	76.57	55.73	94.93	63.93
	5.4	145	82	17.74	22.60	610.85	250.59	5.20	3.33	84.26	61.12	105.07	70.66
172x92	4.8	172	92	18.71	23.83	917.13	346.91	6.20	3.82	106.64	75.41	132.08	85.61
	5.4	172	92	20.88	26.59	1012.47	381.74	6.17	3.79	117.73	82.99	146.55	94.86
200x100	4	200	100	18.01	22.95	1199.71	410.78	7.23	4.23	119.97	82.16		
	5	200	100	22.26	28.36	1459.28	496.94	7.17	4.19	145.93	99.39		
	6	200	100	26.40	33.63	1703.34	576.92	7.12	4.14	170.33	115.38		
	8	200	100	34.38	43.79	2146.27	719.19	7.00	4.05	214.62	143.84		
240x120	4	240	120	21.78	27.75	2110.72	725.35	8.72	5.11	175.89	120.89		
	5	240	120	26.97	34.36	2597.67	882.47	8.67	5.07	214.97	147.08		
	6	240	120	32.05	40.83	3025.91	1030.45	8.61	5.02	252.16	171.74		
	8	240	120	41.91	53.39	3851.50	1299.95	8.55	4.93	320.99	216.66		

### Tolerances

Thickness all sizes	: ± 10%
Outside Dimensions of sides	: ± 1 % with a minimum of + / - 0.5 mm
Weight	
On Individual Lengths	: + 10 %
	: - 8 %
On Lots of 10 Tonnes, min	: ± 7.5 %
Squareness of corner	: 90 Deg ± 2 Deg
Radii of corners - Outside	3 t, Max where t is the thickness of the sections
Length	: ± 6 mm

Customised length ranging from 4 mtr to 15 mtr may be supplied

### Tensile Properties of Hollow Sections

Grade	Tensile	Yield	Elongation,	
	Strength	Stress	25.4 and	Over
	Min, mPa	Min, mPa	under	25.4
Yst 210	330	210	12	20
Yst 240	410	240	10	15
Yst 310	450	310	8	10



# PURVA

Defining Structures

## Steel Pipes & Tubes



# SPECIFICATION FOR STEEL TUBES FOR STRUCTURAL PURPOSES

Conforming to IS 1161 / 2014

NB Nominal Bore in mm	Outside Diameter in (mm)	Thickness (WT) in mm	Weight (Mass) kg/Mtr	Area of Cross Section cm <sup>2</sup>	Internal Volume cm <sup>3</sup> /m	Surface		Moment of Inertia cm <sup>4</sup> /m	Modulus of Section cm <sup>3</sup>	Radius of Gyration cm	Square of Radius of Gyration cm <sup>2</sup>
						External cm <sup>2</sup> /m	Internal cm <sup>2</sup> /m				
15	21.3	2	0.952	1.21	235	669	543	0.57	0.54	0.69	0.47
	21.3	2.6	1.20	1.53	204	669	506	0.68	0.64	0.67	0.45
	21.3	3.2	1.43	1.82	174	669	468	0.77	0.72	0.65	0.42
20	26.9	2.3	1.40	1.78	391	845	701	1.36	1.01	0.87	0.76
	26.9	2.6	1.56	1.98	370	845	682	1.48	1.10	0.86	0.75
	26.9	3.2	1.87	2.38	330	845	644	1.70	1.27	0.85	0.71
25	33.7	2.6	1.99	2.54	638	1059	895	3.09	1.84	1.10	1.22
	33.7	3.2	2.41	3.07	585	1059	858	3.60	2.14	1.08	1.18
	33.7	4	2.93	3.73	519	1059	807	4.19	2.49	1.06	1.12
32	42.4	2.6	2.55	3.25	1087	1332	1169	6.46	3.05	1.41	1.99
	42.4	3.2	3.09	3.94	1018	1332	1131	7.62	3.59	1.39	1.93
	42.4	4	3.79	4.83	929	1332	1081	8.99	4.24	1.36	1.86
40	48.3	2.9	3.25	4.14	1419	1517	1335	10.70	4.43	1.61	2.59
	48.3	3.2	3.56	4.53	1379	1517	1316	11.59	4.80	1.60	2.56
	48.3	4	4.37	5.57	1276	1517	1266	13.77	5.70	1.57	2.47
50	60.3	2.9	4.11	5.23	2333	1894	1712	21.59	7.16	2.03	4.13
	60.3	3.6	5.03	6.41	2215	1894	1668	25.87	8.58	2.01	4.02
	60.3	4.5	6.19	7.89	2067	1894	1612	30.90	10.25	1.98	3.92
65	76.1	2.9	5.24	6.67	3882	2391	2209	44.74	11.76	2.59	6.71
	76.1	3.6	6.44	8.20	3728	2391	2165	54.01	14.19	2.57	6.59
	76.1	4.5	7.95	10.12	3536	2391	2108	65.12	17.11	2.54	6.43
80	88.9	3.2	6.76	8.62	5346	2793	2592	79.21	17.82	3.03	9.19
	88.9	4	8.38	10.67	5140	2793	2542	96.34	21.67	3.00	9.03
	88.9	4.8	9.96	12.68	4939	2793	2491	112.49	25.31	2.98	8.87
90	101.6	3.6	8.70	11.08	6999	3192	2966	133.24	26.23	3.47	12.02
	101.6	4	9.63	12.26	6881	3192	2941	146.28	28.80	3.45	11.93
	101.6	4.8	11.46	14.60	6648	3192	2890	171.39	33.74	3.43	11.74
100	114.3	3.6	9.83	12.52	9009	3591	3365	191.98	33.59	3.92	15.33
	114.3	4.5	12.19	15.52	8709	3591	3308	234.32	41.00	3.89	15.10
	114.3	5.4	14.50	18.47	8413	3591	3252	274.54	48.04	3.85	14.86
110	127	4.5	13.59	17.32	10936	3990	3707	325.29	51.23	4.33	18.78
	127	4.8	14.47	18.43	10825	3990	3688	344.50	54.25	4.32	18.69
	127	5.4	16.19	20.63	10605	3990	3651	382.04	60.16	4.30	18.52
125	139.7	4.5	15.00	19.11	13417	4389	4106	437.20	62.59	4.78	22.87
	139.7	4.8	15.97	20.34	13295	4389	4087	463.33	66.33	4.77	22.78
	139.7	5.4	17.89	22.78	13050	4389	4050	514.50	73.66	4.75	22.58
135	152.4	4.5	16.41	20.91	16151	4788	4505	572.24	75.10	5.23	27.37
	152.4	4.8	17.47	22.26	16016	4788	4486	606.76	79.63	5.22	27.26
	152.4	5.4	19.58	24.94	15748	4788	4448	674.51	88.52	5.20	27.05
150	165.1	4.5	17.82	22.70	19138	5187	4904	732.57	88.74	5.68	32.27
	165.1	4.8	18.98	24.17	18991	5187	4885	777.13	94.14	5.67	32.15
	165.1	5.4	21.27	27.09	18699	5187	4847	864.70	104.75	5.65	31.92
150	165.1	5.9	23.20	29.50	18465	5189	4818	970.00	113.40	5.63	31.72
	165.1	6.3	24.67	31.43	18265	5187	4791	992.28	120.20	5.62	31.57
	165.1	8	30.99	39.48	17460	5187	4684	1221.25	147.94	5.56	30.93
150	168.3	4.5	18.18	23.16	19931	5287	5005	777.22	92.36	5.79	33.56
	168.3	4.8	19.35	24.66	19781	5287	4986	824.57	97.99	5.78	33.44
	168.3	5.4	21.69	27.64	19483	5287	4948	917.69	109.05	5.76	33.21
150	168.3	6.3	25.17	32.06	19040	5287	4891	1053.42	125.18	5.73	32.85
	168.3	8	31.63	40.29	18218	5287	4785	1297.27	154.16	5.67	32.20
	193.7	4.8	22.36	28.49	26619	6085	5784	1271.39	131.27	6.68	44.63
175	193.7	5.4	25.08	31.94	26273	6085	5746	1416.97	146.31	6.66	44.36
	193.7	5.9	27.33	34.81	25987	6085	5715	1536.13	158.61	6.64	44.13
	193.7	6.3	29.12	37.09	25759	6085	5689	1630.05	168.31	6.63	43.95
175	193.7	8	36.64	46.67	24801	6085	5583	2015.54	208.11	6.57	43.19
	219.1	4.8	25.37	32.32	34471	6883	6582	1856.03	169.42	7.58	57.43
	219.1	5.6	29.49	37.56	33947	6883	6531	2141.61	195.49	7.55	57.02
200	219.1	5.9	31.02	39.52	33751	6883	6513	2247.01	205.11	7.54	56.86
	219.1	6.3	33.06	42.12	33491	6883	6487	2386.14	217.81	7.53	56.65
	219.1	8	41.65	53.06	32397	6883	6381	2959.63	270.16	7.47	55.78

Mechanical Properties

Tensile Properties	Tensile Strength	Yield Strength	Elongation on Gauge Length
	Min MPa	Min MPa	Min Percent 5.65% %
Yst 210	330	210	20
Yst 240	410	240	17
Yst 310	450	310	14
Yst 355	490	355	10

Tolerances

Outside Diameter		Thickness ± 10 percent
Up to & including 48.3 mm	+ 0.4 mm - 0.8 mm	
Over 48.3 mm	± 1.0 percent	

Notes

- 1 MPa = 1N/mm<sup>2</sup> = 0.102 kgf/mm<sup>2</sup>
2. Elongation percent for tube up to and including 25 mm nominal bore for all grades shall be 12 minimum



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MANUFACTURERS : STEEL PIPES AND TUBES





# Specification for BLACK STEEL TUBES for use in Water, Non-hazardous Gas, Steam and Air Lines

Conforming to IS 1239 (Part - 1) : 2004

Nominal Bore		Series	Outside Diameter		Wall Thickness (T)		Nominal Mass of Tube Plain End	
in mm	in Inch		Maximum in mm	Minimum in mm	in mm	in Gauge	kg/Mtr	Mtrs/M.Ton
15	0.50	Light	21.4	21.0	2.00	14	0.947	1056
		Medium	21.8	21.0	2.60	12	1.210	826
		Heavy	21.8	21.0	3.20	10	1.440	694
20	0.75	Light	26.9	26.4	2.30	13	1.380	725
		Medium	27.3	26.5	2.60	12	1.560	641
		Heavy	27.3	26.5	3.20	10	1.870	535
25	1.00	Light	33.8	33.2	2.60	12	1.980	505
		Medium	34.2	33.3	3.20	10	2.410	415
		Heavy	34.2	33.3	4.00	8	2.930	341
32	1.25	Light	42.5	41.9	2.60	12	2.540	394
		Medium	42.9	42.0	3.20	10	3.100	323
		Heavy	42.9	42.0	4.00	8	3.790	264
40	1.50	Light	48.4	47.8	2.90	11	3.230	310
		Medium	48.8	47.9	3.20	10	3.560	281
		Heavy	48.8	47.9	4.00	8	4.370	229
50	2.00	Light	60.2	59.6	2.90	11	4.080	245
		Medium	60.8	59.7	3.60	9	5.030	199
		Heavy	60.8	59.7	4.50	7	6.190	162
65	2.50	Light	76.0	75.2	3.20	10	5.710	175
		Medium	76.6	75.3	3.60	9	6.420	156
		Heavy	76.6	75.3	4.50	7	7.930	126
80	3.00	Light	88.7	87.9	3.20	10	6.720	149
		Medium	89.5	88.0	4.00	8	8.360	120
		Heavy	89.5	88.0	4.80	6	9.900	101
100	4.00	Light	113.9	113.0	3.60	9	9.750	103
		Medium	115.0	113.1	4.50	7	12.200	82
		Heavy	115.0	113.1	5.40	5	14.500	69
125	5.00	Medium	140.8	138.5	4.80	6	15.900	63
		Heavy	140.8	138.5	5.40	5	17.900	56
150	6.00	Medium	166.5	163.9	4.80	6	18.900	53
		Heavy	166.5	163.9	5.40	5	21.300	47

## Tolerance on Thickness and Mass

Class	Thickness	Mass (Weight)	
		Single Tube	Per Load of 10 Mton Min.
Light	+ Not Limited	+ 10 percent	+ 7.5 percent
	- 8 percent	- 8 percent	- 5 percent
Medium & Heavy	+ Not Limited	± 10 percent	± 7.5 percent
	- 10 percent		



TM



# PURVA

Defining Structures

## Steel Pipes & Tubes



# Specification for STEEL TUBES FOR MECHANICAL AND GENERAL ENGINEERING PURPOSES

Conforming to IS 3601 / 2006

Outside Diameter	Thickness (WT)	Mass	Area of Cross-Section	Moment of Inertia	Modulus of Sections	Radius of Gyration
mm	mm	kg / Mtr	cm <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm
21.3	1.8	0.866	1.10	0.53	0.50	0.69
	2.0	0.952	1.21	0.57	0.54	0.69
	2.6	1.20	1.53	0.68	0.64	0.67
	3.2	1.43	1.82	0.77	0.72	0.65
	4.0	1.71	2.17	0.86	0.81	0.63
26.9	1.8	1.11	1.42	1.12	0.83	0.89
	2.0	1.23	1.56	1.22	0.91	0.88
	2.3	1.40	1.78	1.36	1.01	0.87
	2.6	1.56	1.98	1.48	1.10	0.86
	3.2	1.87	2.38	1.70	1.27	0.85
33.7	4.0	2.26	2.88	1.95	1.45	0.82
	2.0	1.56	1.99	2.51	1.49	1.12
	2.3	1.78	2.27	2.81	1.67	1.11
	2.6	1.99	2.54	3.09	1.84	1.10
	3.2	2.41	3.07	3.60	2.14	1.08
42.4	4.0	2.93	3.73	4.19	2.49	1.06
	4.5	3.24	4.13	4.51	2.68	1.05
	2.3	2.27	2.90	5.85	2.76	1.42
	2.6	2.55	3.25	6.46	3.05	1.41
	3.2	3.09	3.94	7.62	3.59	1.39
48.3	3.6	3.44	4.39	8.33	3.93	1.38
	4.0	3.79	4.83	8.90	4.24	1.36
	5.0	4.61	5.87	10.45	4.93	1.33
	2.3	2.61	3.32	8.80	3.64	1.63
	2.6	2.93	3.73	9.77	4.05	1.62
60.3	2.9	3.25	4.14	10.70	4.43	1.61
	3.2	3.56	4.53	11.59	4.80	1.60
	3.6	3.97	5.05	12.69	5.25	1.59
	4.0	4.37	5.57	13.77	5.70	1.57
	4.9	5.24	6.64	15.99	6.63	1.55
76.1	5.0	5.34	6.80	16.15	6.69	1.54
	2.3	3.29	4.19	17.65	5.85	2.05
	2.6	3.70	4.71	19.64	6.51	2.04
	2.9	4.11	5.23	21.59	7.16	2.03
	3.2	4.51	5.74	23.47	7.78	2.02
88.9	3.6	5.03	6.41	25.87	8.58	2.01
	4.0	5.55	7.07	28.15	9.34	2.00
	4.5	6.19	7.89	30.90	10.20	1.98
	5.0	6.82	8.70	33.48	11.10	1.96
	2.6	4.71	6.00	40.57	10.66	2.60
101.6	2.9	5.23	6.67	44.74	11.76	2.59
	3.2	5.75	7.33	48.78	12.80	2.58
	3.6	6.44	8.20	54.01	14.20	2.57
	4.5	7.95	10.10	65.12	17.10	2.54
	5.0	8.77	11.16	70.87	18.63	2.52
114.3	2.9	6.15	7.83	72.47	16.30	3.04
	3.2	6.76	8.62	79.21	17.80	3.03
	4.0	8.38	10.70	96.34	21.70	3.00
	5.0	10.30	13.20	116.40	26.20	2.97
	5.4	11.10	14.00	123.80	27.80	2.97
127.0	5.6	11.50	14.65	127.64	28.72	2.95
	6.3	12.80	16.20	141.20	31.80	2.93
	8.0	16.00	20.32	167.86	37.76	2.87
	3.6	8.70	11.10	133.20	26.20	3.47
	4.0	9.63	12.30	146.20	28.80	3.45
139.7	5.0	11.90	15.20	177.50	34.90	3.42
	3.2	8.77	11.16	172.33	30.15	3.93
	3.6	9.83	12.50	192.00	33.60	3.92
	4.5	12.20	15.50	234.30	41.00	3.89
	5.4	14.50	18.50	274.50	48.00	3.86
152.4	6.3	16.80	21.20	315.00	55.10	3.83
	8.0	21.00	26.30	377.60	66.00	3.78
	4.5	13.60	17.30	325.30	51.20	4.33
	5.0	15.00	19.20	357.10	56.20	4.32
	5.4	16.20	20.60	302.00	60.20	4.30

Outside Diameter	Thickness (WT)	Mass	Area of Cross-Section	Moment of Inertia	Modulus of Sections	Radius of Gyration
mm	mm	kg / Mtr	cm <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm
139.7	3.6	12.10	15.38	356.36	51.02	4.81
	4.0	13.40	17.04	392.57	56.20	4.80
	4.5	15.00	19.10	437.20	62.60	4.78
	5.0	16.60	21.20	480.50	68.80	4.77
	5.4	17.90	22.80	514.50	73.70	4.75
152.4	6.3	20.70	26.30	591.00	84.70	4.73
	8.0	26.00	32.50	716.00	103.00	4.71
	4.5	16.40	20.90	572.20	75.10	5.23
	5.0	18.20	23.20	629.50	82.60	5.21
	5.4	19.60	24.90	674.50	88.50	5.20
165.1	4.5	17.80	22.70	732.60	88.70	5.68
	5.0	19.70	25.10	806.60	97.70	5.66
	5.4	21.20	27.10	864.70	105.00	5.65
	6.3	24.80	31.40	992.00	120.00	5.63
	4.0	16.20	20.64	696.87	82.81	5.81
168.3	4.5	18.20	23.20	777.20	98.40	5.79
	5.0	20.10	25.70	855.80	102.00	5.78
	5.4	21.70	27.60	917.70	109.00	5.76
	6.3	25.20	32.10	1053.00	125.00	5.73
	7.1	28.20	35.94	1169.66	139.00	5.70
193.7	8.0	31.60	39.70	1288.00	153.00	5.69
	5.0	23.30	29.60	1320.00	136.00	6.67
	5.4	25.10	31.90	1417.00	146.00	6.66
	5.9	27.30	34.80	1536.00	159.00	6.64
	6.3	29.10	37.00	1600.00	165.00	6.60
219.1	8.0	36.60	46.30	2004.00	207.00	6.57
	4.5	23.80	30.32	1746.18	159.40	7.59
	5.0	26.40	33.60	1928.00	176.00	7.57
	5.6	29.50	37.60	2142.00	195.00	7.56
	6.3	33.10	42.00	2404.00	219.00	7.54
8.0	41.60	52.00	1940.00	268.00	7.52	

## Tolerances

Over mm	Outside Diameter Up to and Including mm	Tolerance on Outside Diameter mm	Thickness	Straightness
-	25.40	± 0.15		
25.40	51.00	± 0.18		
51.00	63.50	± 0.25		
63.50	76.10	± 0.25		
76.10	88.90	± 0.31	± 10 %	Less than 1/600
88.90	101.60	± 0.36		
101.60	114.30	± 0.43		
114.30	152.40	± 0.58		
152.40	168.30	± 0.65		
168.30	-	± 0.75		

## Mechanical Properties

Types and Grades	Tensile Strength Min	Yield Stress Min	Elongation Percent	
			As Welded (less than or equal to 33.7 mm OD)	As Welded (More Than 33.7 mm OD)
WT 160	310	160	15	22
WT 210	330	210	12	20
WT 240	410	240	10	15
WT 310	450	310	6	10



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MANUFACTURERS : STEEL PIPES AND TUBES





# Specification for STEEL TUBES FOR IDLERS FOR BELT CONVEYORS

Conforming to IS 9295/1983

Outside Diameter in mm	Thickness (T) in mm	Weight Mass	
		Kg/ Mtr	Mtr/ Tonne
63.5	3.65	5.39	186
	4.5	6.55	153
76.1	3.65	6.52	153
	4.5	7.95	126
88.9	4.05	8.47	118
	4.85	10.05	100
	6.3	12.83	78
101.6	4.05	9.74	103
	4.85	11.57	86
	6.3	14.81	68
114.3	4.5	12.19	82
	5.4	14.50	69
	6.3	16.78	60
127	4.5	13.60	74
	4.85	14.61	68
	5.4	16.10	62
	6.3	18.75	53
139.7	4.5	15.00	67
	4.85	16.13	62
	5.4	17.89	56
	6.3	20.73	48
165.1	4.5	17.80	56
	4.85	19.17	52
	5.4	21.27	47
168.3	6.3	24.67	41
	4.5	18.20	55
	4.85	19.55	51
193.7	5.4	21.69	46
	6.3	25.17	40
	5.4	25.10	40
219.1	6.3	29.12	34
	7.1	32.67	31
	5.4	28.50	35
219.1	6.3	33.06	30
	7.1	37.12	27

## Mechanical Properties

Tube Designation	Tensile Strength Mpa min	Yield Stress Mpa min	Elongation percent min
ERW 210	330	210	20
ERW 240	410	240	18
ERW 310	450	310	15

## Tolerances

Ovality	Below 168.30	0.5 mm
	Including 168.3 and Above	1.0 mm
Mass	Single Tube	± 10 %
	Per Load of 10 Tonne	± 7.5 %
Eccentricity		5% Max
Outside Diameter		± 0.8 %
Thickness		± 10 %
Length		+ 6 mm
		- 0 mm



# PURVA

Defining Structures

## Steel Pipes & Tubes





# PURVA

— Defining Structures —

Steel Pipes & Tubes

**Purva Metal Sections Pvt. Ltd.**

Regd. Office :

# 193, "SHIV SADAN", 4th Flr, Opp. to NCC Apts.

Near Royal Enfield Showroom, B. Narayanapura

Outer Ring Road, Bangalore - 560 016.

Tele : +91 80-71011505 (30 Lines) Fax : +91 80-71011516

E-mail : surya@purvagroup.in

Factory :

SY. No. 26/1, 26/2, Chickakunthuru Village, Sy No. 52, 53

Kodaginabele Village, Malur-Bangarpete Road

Bytrayanahalli, Railway Station, Malur - 563130.

Ph.: 08151 238883 / 238884 / 238885

E-mail : info@purvametal.com

[www.purvametal.com](http://www.purvametal.com) | [www.purvagroup.com](http://www.purvagroup.com)