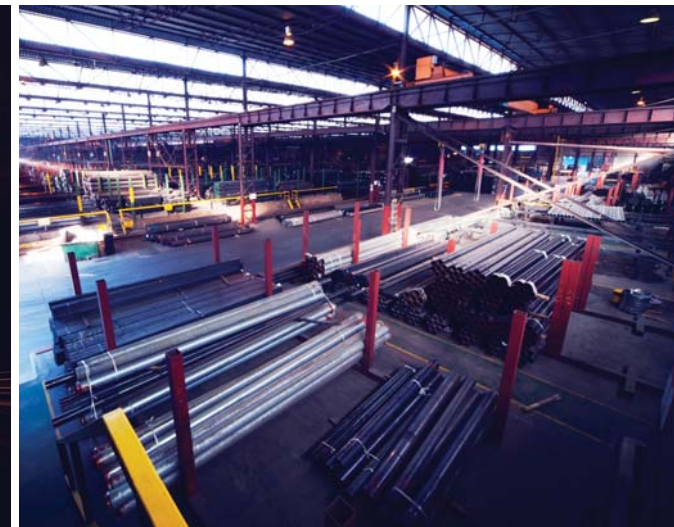


# MACSTEEL

Africa's leading steel supplier



CATALOGUE



TUBE & PIPE



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For more information visit [www.macsteel.co.za](http://www.macsteel.co.za)

## Macsteel Service Centres SA

With a proud history spanning more than 100 years, Macsteel Service Centres SA has developed and expanded into the leading merchandiser and distributor of steel and value added steel products in Africa.

10 dynamic Business Units within Macsteel Service Centres SA operate from a geographic network of over 79 branches and warehouses which supply the most comprehensive range of steel, stainless steel, aluminium products and processes available to industry.

To ensure the most beneficial and efficient focus on the varied needs our valued client base, we categorise our Business Units into 2 broad sectors - Trading and Manufacturing.

### Trading businesses in the Group are:

- Macsteel Exports
- Macsteel Trading
- Macsteel VRN

### The Value adding and converting businesses are:

- Macsteel Coil Processing
- Macsteel Flanges
- Macsteel Fluid Control
- Macsteel Reinforcing
- Macsteel Roofing
- Macsteel Special Steels
- Macsteel Tube & Pipe
- Macsteel VRN

We employ over 5500 Macsteelers and they are core to the fulfilment of the Macsteel Group's service promise. Their experience, knowledge and passion underpins the strength of our brand and the success of our business partnerships.

We invite and nurture dynamic partnerships with our suppliers, ensuring a healthy respect for product quality and reliable service combined with competitive prices.

Macsteelers are committed, knowledgeable steel people and together with our superb infrastructure, are perfectly placed to meet the steel requirements of industry.

At Macsteel, our valued customers are at the centre of our focus. Exceptional levels of personalised service enable us to partner our clients throughout the entire steel supply chain, thereby ensuring repeat business and customer satisfaction.

Kindly contact us, we sincerely look forward to being of service to You.

For more information visit [www.macsteel.co.za](http://www.macsteel.co.za)

## Specialists in the rolling of tube to the highest quality standards.

Macsteel Tube & Pipe manufactures structural tubing and is one of the largest producers of welded tube and pipe in Africa.

The factory complex is located in Boksburg. Our 100 000m<sup>2</sup> facility supplies a large and diverse range of products to various industries. The company's core skill is that of forming and welding steel strip to produce tube and pipe of the highest quality. These skills are enhanced by the CAD design facility for roll forming and a CNC roll manufacturing operation. Macsteel Tube & Pipe adds further value by Galvanizing, Fittings, Laser Cutting, Cutting, Painting and Coating its products. The plant is able to supply special sections and wall thicknesses as per customer requirements.

### The Macsteel Tube & Pipe facility supplies products manufactured to international quality standards for uses in:

- Water and other conveyance applications
- Tube and structural engineering and general engineering end use
- Mechanical Application such as:
  - Hi-tensile scaffolding
  - Conveyor idler tube
  - Mine support systems
  - Furniture and general purpose precision tubing
  - Tube and general galvanizing

These products are produced from a number of different quality steels, namely:

- SAE 1008
- DIN 17 100 ST 37
- EN 10219 S 235 JRH
- EN 10219 S 275 JRH
- EN 10219 S 355 MH
- EN 10255 S 195T

We thank you for taking the time to familiarise yourself with our capabilities and sincerely look forward to being of service to You.

### Products Manufactured include:

- Rounds
- Squares
- Rectangles
- Ovals
- Special Profiles

For more information visit [www.macsteel.co.za](http://www.macsteel.co.za)

## Scope

- Non Alloy Steel Tubes suitable for welding and threading.

## Technical Information:

- Note! This specification supersedes BS 1387, DIN 2440
- This specification covers medium and heavy pipe in Table 1 and covers Types L, Types L1, Types L2 in Tables B1, B2 and B3
- Hydraulic Pressure test to 50 bar
- Tolerance on wall thickness (see table below)
- Pipes supplied Plain-Ends and Square Cut
- Pipes can be supplied Galvanized to EN 10240 or (ISO) 1461, as required
- The colour bands are as follows:

Pipe Type	Colour Band	Table Ref.	Wall Thick. Toler.
Medium	Blue	1	±10%
Heavy	Red	1	±10%
Light	Green	B1	±10%
Light 1	White	B2	-8%
Light 2	Brown	B3	-8%

## Material

- Chemical Composition and Mechanical properties

Steel Grade	Chemical Composition				Mechanical Properties Mpa		
	C Max	Mn	P Max	.S. Max	Yield Length	Tensile Strength	Elongation Min %
S195T	0.20	1.40	0.035	0.030	195	320-520	20%

**Table 1: Dimensions, diameter and tolerance**

Specified outside diameter	Size		Outer Diameter		Medium Series			Heavy Series		
					Wall Thickness	Mass per Meter		Wall Thickness	Mass per Meter	
OD	NB		Max	Min	T (mm)	Plain End (kg/m)	Socketed (kg/m)	T (mm)	Plain End (kg/m)	Socketed (kg/m)
(mm)			(mm)	(mm)						
21.3	1/2"	15	21.8	21.0	2.6	1.21	1.22	3.2	1.44	1.45
26.9	3/4"	20	27.3	26.5	2.6	1.56	1.57	3.2	1.87	1.88
33.7	1"	25	34.2	33.3	3.2	2.41	2.43	4.0	2.93	2.95
42.4	1 1/4"	32	42.9	42.0	3.2	3.10	3.13	4.0	3.79	3.82
48.3	1 1/2"	40	48.8	47.9	3.2	3.56	3.60	4.0	4.37	4.41
60.3	2"	50	60.8	59.7	3.6	5.03	5.10	4.5	6.19	6.26
76.1	2 1/2"	65	76.6	75.3	3.6	6.42	6.54	4.5	7.93	8.05
88.9	3"	80	89.5	88.0	4.0	8.36	8.53	5.0	10.3	10.5
114.3	4"	100	115.0	113.1	4.5	12.2	12.5	5.4	14.5	14.8
139.7	5"	125	140.8	138.5	5.0	16.6	17.1	5.4	17.9	18.4
165.1	6"	150	166.5	163.9	5.0	19.8	20.4	5.4	21.3	21.9

**Table B1: Dimensions, diameter and tolerance: Type L**

Specified outside diameter	Size		Outer Diameter		Wall Thickness	Mass per Meter	
						Plain End	Threaded and Socketed
OD	NB		Max	Min	T		
(mm)			(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2"	15	21.7	21.0	2.3	1.08	1.09
26.9	3/4"	20	27.1	26.4	2.3	1.40	1.41
33.7	1"	25	34.0	33.2	2.9	2.20	2.22
42.4	1 1/4"	32	42.7	41.9	2.9	2.82	2.85
48.3	1 1/2"	40	48.6	47.8	2.9	3.25	3.29
60.3	2"	50	60.7	59.6	3.2	4.51	4.58
76.1	2 1/2"	65	76.0	75.2	3.2	5.75	5.87
88.9	3"	80	88.7	87.9	3.2	6.76	6.93
101.6	3 1/2"		101.2	100.3	3.6	8.70	8.88
114.3	4"	100	113.9	113.0	3.6	9.83	10.10
139.7	5"	125	140.8	138.5	4.5	15.00	15.50
165.1	6"	150	166.5	163.9	4.5	17.80	18.40

- Pipes supplied Plain-Ends and Square Cut
- Pipes can be supplied Galvanized to EN 10240 or ISO 1461, as required



**Table B2: Dimensions, diameter and tolerance: Type L1**

Specified outside diameter	Size	Outer Diameter		Wall Thickness	Mass per Meter	
		Max	Min		Plain End	Threaded and Socketed
OD	NB	(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2"	21.7	21.0	2.3	1.08	1.09
26.9	3/4"	27.1	26.4	2.3	1.39	1.40
33.7	1"	34.0	33.2	2.9	2.20	2.22
42.4	1 1/4"	42.7	41.9	2.9	2.82	2.85
48.3	1 1/2"	48.6	47.8	2.9	3.24	3.28
60.3	2"	60.7	59.6	3.2	4.49	4.56
76.1	2 1/2"	76.3	75.2	3.2	5.73	5.85
88.9	3"	89.4	87.9	3.6	7.55	7.72
114.3	4"	114.9	113.0	4.0	10.80	11.10

**Table B3: Dimensions, diameter and tolerance: Type L2**

Specified outside diameter	Size	Outer Diameter		Wall Thickness	Mass per Meter	
		Max	Min		Plain End	Threaded and Socketed
OD	NB	(mm)	(mm)	(mm)	(kg/m)	(kg/m)
21.3	1/2"	21.4	21.0	2.0	0.94	0.95
26.9	3/4"	26.9	26.4	2.3	1.38	1.39
33.7	1"	33.8	33.2	2.6	1.98	2.00
42.4	1 1/4"	42.5	41.9	2.6	2.54	2.57
48.3	1 1/2"	48.4	47.8	2.9	3.23	3.27
60.3	2"	60.2	59.6	2.9	4.08	4.15
76.1	2 1/2"	76.0	75.2	3.2	5.71	5.83
88.9	3"	88.7	87.9	3.2	6.72	6.89
114.3	4"	113.9	113.0	3.6	9.75	10.00

- Pipes supplied Plain-Ends and Square Cut
- Pipes can be supplied Galvanized to EN 10240 or ISO 1461, as required



**Technical Information:**

- Pipe in this series are supplied in 18, 21 & 24ft lengths or subject to enquiry
- Tolerance on Thickness: wall thickness not more than 12.5% under normal thickness
- Tolerance on Weight  $\pm 10\%$
- Tolerance on Length -0mm  $\pm 50\text{mm}$
- Pipe supplied plain-ends, reamed or beveled. Beveled from 1 1/2" >
- Coatings: Black Primer / Hot Dipped Galvanized

**Chemical Composition:**

		Grade A	Grade B
- Carbon	Max	0.25	0.30
- Manganese	Max	0.95	1.20
- Phosphorus	Max	0.05	0.05
- Sulphur	Max	0.045	0.045

**Mechanical Properties:**

- Classification	Tensile	Yield
	Min psi (MPa)	Min psi (MPa)
Grade A	48,000 (330)	30,000 (205)
Grade B	60,000 (415)	35,000 (240)

**SCH. 40 GRADE A**

NPS Designator	Specified Outside Diameter		Specified Wall Thickness				Weight Plain-end	
	in.	(mm)	in. Max	in. Min	mm Max	mm Min	lb/ft	kg/m
1/2"	0.840	21.3	0.109	0.095	2.77	2.41	0.85	1.27
3/4"	1.050	26.7	0.113	0.099	2.87	2.51	1.13	1.69
1"	1.315	33.4	0.133	0.116	3.38	.295	1.68	2.50
1 1/4"	1.660	42.2	0.140	0.122	3.56	3.10	2.27	3.39
1 1/2"	1.900	48.3	0.145	0.127	3.68	3.23	2.72	4.05
2"	2.375	60.3	0.154	0.135	3.91	3.43	3.65	5.44
2 1/2"	2.875	73.0	0.203	0.178	5.16	4.52	5.79	8.63
3"	3.500	88.9	0.216	0.189	5.49	4.80	7.58	11.29
3 1/2"	4.000	101.6	0.226	0.198	5.74	4.03	9.11	13.57
4"	4.500	114.3	0.237	0.207	6.02	5.26	10.79	16.07

## Fire Protection

### Technical Information:

- The pipe in this series are supplied in lengths of 18, 21, 24ft or subject to enquiry
- Tolerance on Thickness: Medium wall thickness not more than 12.5% under the normal thickness
- Tolerance on Weight  $\pm 10\%$
- Tolerance in Length  $-0\text{mm} \pm 50\text{mm}$
- Tubes are supplied plain-ends, reamed or beveled -  $>3"$
- Outside Diameter shall not vary more than  $\pm 1\%$  from the Specified Outside Diameter

### LIGHT WALL TUBING

Normal Size	Outside	Diameter	Wall Thickness		Weight Plain-end	
			in	mm	lb/ft	kg/m
3/4"	1.050	26.7	0.083	2.11	0.86	1.28
1"	1.315	33.4	0.109	2.77	1.41	2.09
1 1/4"	1.660	42.2	0.109	2.77	1.81	2.69
1 1/2"	1.900	48.3	0.109	2.77	2.09	3.11
2"	2.375	60.3	0.109	2.77	2.64	3.93
2 1/2"	2.875	73.0	0.120	3.05	3.53	5.26
3"	3.500	88.9	0.120	3.05	4.34	6.46
3 1/2"	4.000	101.6	0.120	3.05	4.98	7.41
4"	4.500	114.3	0.120	3.05	5.62	8.37
6"	6.625	168.3	0.134	3.40	9.30	13.85
8"	8.625	219.1	0.188	4.78	16.96	25.26

**Technical Information:**

- Pipes are supplied in standard lengths of 6m (other lengths can be supplied on request)
- Threading conforms to SABS 1109 (equivalent to ISO 7)
- Pipes are tested for leak tightness in accordance to the specification
- Pipes are galvanized to EN 10240 or ISO 1461 as required
- Chemical Composition and Mechanical properties of steel

Chemical Composition % Max				Mechanical Properties Min		
C	Mn	P	.S.	Yield Stress MPa	UTS MPa	Elongation
0.22	1.6	0.025	0.02	200	300	15%

NOTE! Steel pipes of normal size not exceeding 150mm - suitable for threading

**Class: MEDIUM**

Pipe Size NB	Outside Dia max/mm	Outside Dia min/mm	Wall Thickness min/mm	Mass of Black Pipe	
				Plain end kg/m	Screwed & Socketed kg/m
15	21.7	21.1	2.3	1.123	1.202
20	27.2	26.6	2.3	1.442	1.543
25	34.2	33.4	2.8	2.225	2.404
32	42.0	42.1	2.8	2.843	3.001
40	48.8	48.0	2.8	3.261	3.565
50	60.8	59.8	3.2	4.606	5.056
65	76.6	75.4	3.2	5.869	6.616
80	89.5	88.1	3.5	7.604	8.720
100	114.9	114.3	3.9	10.924	12.726
125	140.6	138.7	4.2	14.447	17.193
150	166.1	164.1	4.2	17.148	20.804

**Class: HEAVY**

Pipe Size NB	Outside Dia max/mm	Outside Dia min/mm	Wall Thickness min/mm	Mass of Black Pipe	
				Plain end kg/m	Screwed & Socketed kg/m
15	21.7	21.1	2.8	1.338	1.417
20	27.2	26.6	2.8	1.728	1.829
25	34.2	33.4	3.5	2.711	2.890
32	42.9	42.1	3.5	3.481	3.639
40	48.8	48.0	3.5	4.003	4.307
50	60.8	59.8	3.9	5.598	6.048
65	76.6	75.4	3.9	7.153	7.900
80	89.5	88.1	4.2	9.033	10.149
100	114.9	113.3	4.7	12.021	14.823
125	140.6	138.7	4.7	16.058	18.804
150	166.1	164.1	4.7	19.072	22.728

## Light Gauge Welded Steel Pipes

### Technical Information:

- Pipes are supplied in standard lengths of 6m (other lengths can be supplied on request)
- Pipes are tested for leak tightness in accordance to the specification
- Pipes galvanized to EN 10240 or ISO 1461 as required
- The Specification make provision for different diameters not classified as water
- Pipes only supplied Plain Ends

Chemical Composition % Max					Mechanical Properties Min		
C	Mn	P	.S.	Si	Yield Stress MPa	UTS MPa	Elongation
0.22	1.6	0.025	0.02	<0.040%	200	300	15%

Size				Mass of Black or Uncoated	Mass of Galvanized
Outer Diameter mm	OD Max/mm	OD Min/mm	Wall Thickness	PE (kg/m)	PE (kg/m)
21.2	21.5	20.9	2.0	0.947	0.982
26.7	27.0	26.4	2.1	1.274	1.350
31.8	32.1	31.5	2.1	1.538	1.630
33.5	33.8	33.2	2.4	1.840	1.951
33.7	34.0	33.4	2.4	1.853	1.964
42.2	42.5	41.9	2.4	2.356	2.497
42.4	42.7	42.1	2.4	2.367	2.509
48.1	48.4	47.8	2.6	2.917	3.093
48.6	48.9	48.3	2.6	2.950	3.126
50.9	51.3	50.7	2.6	3.103	3.289
57.0	57.3	56.7	2.6	3.488	3.697
60.3	60.6	60.0	2.6	3.700	3.922
63.5	63.8	63.2	2.8	4.191	4.443
73.0	73.3	72.7	3.0	5.179	5.490
76.2	76.5	75.9	3.0	5.416	5.471
88.9	89.2	88.6	3.0	6.355	6.737
101.6	101.9	101.3	3.0	7.295	7.733
114.3	114.6	114.0	3.3	9.034	9.576
127.0	127.3	126.7	3.3	10.067	10.761
133.0	133.3	132.7	3.3	10.555	11.189
139.7	140.0	139.4	3.3	11.101	11.767
152.4	152.7	152.1	3.3	12.134	12.862
159.0	159.3	158.7	3.3	12.671	13.432
165.1	165.4	164.8	3.5	13.949	14.785
219.1	219.4	218.8	3.5	18,610	19.726

For more information visit [www.macsteel.co.za](http://www.macsteel.co.za)

**Technical Information:**

ELECTRIC WELDED LOW CARBON STEEL PIPES FOR AQUEOUS FLUIDS (LARGE BORE)

(Equivalent specification - EN 10244)

Grade of Pipe	Chemical Composition % Max				Si	Mechanical Properties Min		
	C	Mn	P	.S.		Yield Stress MPa	UTS MPa	Elongation
A	0.20	0.90	0.04	0.020	0.04% max or	207	331	25%
B	0.26	1.15	0.04	0.020		241	414	22%
C	0.28	1.25	0.04	0.020	0.135% to 0.25%	290	414	22%
D	0.28	1.60	0.04	0.035		355	450	22%

**Dimension:**

- Nominal bore, outside diameter and wall thickness
- Standard lengths 6.1m, 9.144m and 12.2m lengths
- Pipes are tested for leak tightness in accordance to the specification
- Pipes galvanized to ISO 1461 as required

Nominal Bore	Nominal O.D.	O.D.	O.D.	Wall Thickness				
				Max/mm	Min/mm	Mass		
mm	mm	Max/mm	Min/mm	3.0	3.5	4.0	4.5	6.0
200	219,1	219.50	218.60	16.00 kg/m	18.61 kg/m	21.01 kg/m	23.97 kg/m	31.27 kg/m

**Scope:**

- Cold Formed welded structural hollow sections of non-alloy and fine grain steels

**Technical Information:**

- The above specification supersedes the DIN 1615
- Length Supplied from 6.0m up to 6.5m
- Macsteel Tube & Pipe uses equivalent specifications
- BS EN 10219-2 Covers Rounds, Squares, and Rectangular
- See Tables for:
  - Circular Hollow Sections Table 1
  - Square Hollow Sections Table 2
  - Rectangular Hollow Sections Table 3

**Material:**

- Chemical Composition and Mechanical properties

Steel Grade	% By Mass Chemical						Mechanical Properties		
Steel Name	C Max	Si Max	Mn Max	P Max	S Max	N Max	Yield Min	Tensile Strength	Elongation Min %
S235JRH	0.17	-	1.40	0.045	0.045	0.009	235	360/510	20
S275JOH	0.20	-	1.50	0.040	0.040	0.009	275	430/580	20
S355MH	0.14	0.15 - 0.25	1.50	0.035	0.030	0.009	355	450/550	22

Table 1: Dimensions and Mass of Circular Hollow Sections

Outside Diameter OD (mm)	Wall Thickness (Mass per meter)								
	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
19.1	0.688	0.840							
21.3	0.778	0.953	1.158						
25.4	0.939	1.154	1.411						
26.9	1.002	1.233	1.502	1.768					
31.8	1.189	1.467	1.817	2.123					
34.1	1.282	1.562	1.942	2.293					
38.1	1.440	1.780	2.192	2.790		3.364			
42.4	1.642	2.012	2.484	2.944	3.419	3.793			
48.3	1.846	2.288	2.830	3.358	3.915	4.366	4.912		
50.8	1.940	2.406	3.089	3.533	4.083	4.616	5.169		
60.3	2.317	2.875	3.700	4.224	4.876	5.551	6.154		
63.5	2.440	3.031	3.758	4.472	5.174	5.875	6.541		
76.1	2.942	3.658	4.534	5.416	6.261	7.105	7.939	8.779	10.308
88.9	3.233	4.286	5.327	6.355	7.371	8.375	9.366	10.345	12.172
101.6	3.986	4.908	6.104	7.288	8.460	9.619	10.760	11.911	14.135
114.3		5.534	6.893	8.221	9.555	10.880	12.170	13.465	16.011
127.0		6.165	7.669	9.166	10.660	12.120	13.590	15.044	17.880
139.7				10.110	11.760	13.390	15.000	16.610	19.780
152.4				11.050	12.850	14.640	16.410	18.180	21.660
168.3				11.990	13.950	15.890	17.810	19.740	23.540
177.8				13.000		17.230	19.340		25.217
193.7				14.130	16.440	18.530	21.030	23.300	27.820
219.1				15.778	18.766	21.010	23.810	26.425	31.530



Table 2: Dimensions and Mass of Square Hollow Sections

Spec Size	MT&P	Wall Thickness (Mass per meter)								
OD (mm)	OD (mm)	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
20.0	19.1	0.894	1.097							
25.0	25.4	1.212	1.496	1.817	2.164					
30.0	31.8	1.531	1.894	2.391	2.831					
40.0	40.0	1.824	2.314	2.944	3.492		4.574			
50.0	50.8	2.488	3.090	3.979	4.472	5.174	5.864	6.541		
60.0	60.0	2.937	3.517	4.491	5.403	6.261	7.105	7.939		
70.0	70.0	3.090	3.844	4.774	5.691	6.713	7.499	8.371		
80.0	80.0	3.710	4.583	5.690	6.801	7.891	8.969	10.034	11.316	13.327
100.0	101.6		6.160	7.669	9.166	10.650	12.120	13.580	15.030	17.900
120.0	120.0				11.050		14.640	16.410	18.180	21.160
150.0	150.0				14.130	16.277	18.750	21.030	23.300	27.820

TUBE &amp; PIPE

Table 3: Dimensions and Mass of Rectangular Hollow Sections

Spec Size	MT&P	Wall Thickness (Mass per meter / Lbs per FT)								
		1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
	25,4 x 12.7	0.894								
	31.0 x 19.0	1,212	1.469							
40.0 x 20.0	38.0 x 19.0	1.435	1.667							
	38.0 x 25.0	1.531	1.894	2.390	2.704					
	50.0 x 25.0	1.850	2.293	2.803	3.326					
50.0 x 30.0	50.0 x 38.0	2.190	2.718	3.366	4.003					
60.0 x 40.0	60.0 x 40.0	2.294	3.041	3.770	4.487	5.221	5.732	6.588		
	63.0 x 38.0		3.031	3.756	4.476					
	76.0 x 25.0	2.440	3.031	3.758	4.472		5.174			
	76.0 x 38.0	2.817	3.501	4.346	5.178	5.998	6.652	7.581		
70.0 x 50.0	76.0 x 50.0	3.090	3.844	4.774	5.691	6.597	7.499	8.371		
80.0 x 40.0	80.0 x 40.0	2.937	3.652	4.534	5.403	6.261	7.105	7.937		
100.0 x 50.0	100.0 x 50.0	3.673	4.583	5.690	6.801	7.891	8.969	10.034	11.129	13.104
	127.0 x 76.0		6.160	7.669	9.166	10.650	12.120	13.580	15.278	18.042
120.0 x 80.0	120.0 x 80.0					10.660	12.130	13.598	15.044	17.762
200.0 x 100.0	200.0 x 100.0				14.130	16.440	18.750	21.030	23.300	28.820

Note: Metric Equivalent Rectangles will be considered as per request

**Technical Information:**

- Structural tubing is produced in accordance with “cold Formed Welded Carbon Steel Structural Tubing in Shapes”, ASTM A500
- Thickness Tolerance  $\pm 10\%$
- Tubing is produced in Grade A & B
- Grade B: subject to minimum quantities
- Outside Diameter shall not vary more than  $\pm 0.75\%$  to the Specified Outside Diameter

**Chemical and Tensile Requirements**

## Chemical Composition

## Tensile Requirements

		Grade A	Grade B			Grade A	Grade B
Carbon	Max	0.260	0.300	Tensile Strength Min, psi (MPa)		45 000 (310)	58 000 (400)
Manganese	Max	1.350	1.400	Yield Strength Min, psi (MPa)		33 000 (228)	42 000 (290)
Phosphorus	Max	0.035	0.045	Elongation Min % (50.8mm)		25	23
Sulphur	Max	0.035	0.045				
Copper	Max	0.200	0.180				

**Circular: Round Structural Tubing****Table 3: Dimensions and Mass of Circular Hollow Sections**

Outer Diameter		Wall Thickness (Mass per meter / Lbs per FT)																	
Inches	OD mm	1.6 kg/m	0.063 lbs/m	2.0 kg/m	0.078 lbs/ft	2.5 kg/m	0.098 lbs/ft	3.0 kg/m	0.120 lbs/ft	3.5 kg/m	0.138 lbs/ft	4.0 kg/m	0.156 lbs/ft	4.5 kg/m	0.177 lbs/ft	5.0 kg/m	0.197 lbs/ft	6.0 kg/m	0.236 lbs/ft
3.4"	19.1	0.688	0.462	0.840	0.564														
1"	25.4	0.939	0.630	1.154	0.775	1.411	0.948												
1 1/4"	31.8	1.189	0.798	1.467	0.985	1.817	1.220	2.123	1.426										
1 1/2"	38.1	1.440	0.967	1.780	1.196	2.192	1.472	2.790	1.874			3.364	2.260						
2"	50.8	1.940	1.303	2.406	1.616	3.089	2.075	3.533	2.374	4.083	2.743	4.616	3.101	5.169	3.473				
2 1/2"	63.5	2.440	1.639	3.031	2.036	3.758	2.525	4.472	3.005	5.174	3.476	5.875	3.947	6.541	4.395				
3"	76.1	2.942	1.976	3.658	2.458	4.534	3.046	5.416	3.639	6.261	4.207	7.105	4.774	7.939	5.334	8.779	5.899	10.308	6.926
4"	101.6	3.986	2.678	4.908	3.298	6.104	4.101	7.288	4.897	8.460	5.684	9.619	6.463	10.760	7.230	11.911	8.003	14.135	9.498
5"	127.0			6.165	4.142	7.669	5.153	9.166	6.159	10.660	7.163	12.120	8.144	13.590	9.132	15.044	10.109	17.880	12.014
6"	152.4							11.050	7.425	12.850	8.634	14.640	9.837	16.410	11.027	18.180	12.216	21.660	14.554

### Rectangles: Shaped Structural Tubing - Chemical and Tensile Requirements

#### Chemical Composition

		Grade A	Grade B
Carbon	Max	0.260	0.300
Manganese	Max	1.350	1.400
Phosphorus	Max	0.035	0.045
Sulphur	Max	0.035	0.045
Copper	Max	0.200	0.180

#### Tensile Requirements

	Grade A	Grade B
Tensile Strength Min, psi (MPa)	45 000 (310)	58 000 (400)
Yield Strength Min, psi (MPa)	39 000 (269)	46 000 (317)
Elongation Min % (50.8mm)	25	23

### Dimensions and Mass of Rectangle Sections

Size (inches)	Imperial		Size (mm)	Metric	
	Thickness (inches)	Mass lbs per foot		Thickness (mm)	kg/m
1 1/4" x 3/4"	0.060	0.752	31.75 x 19.05	1.5	1.120
	0.063	0.793		1.6	1.180
	0.078	0.961		2.0	1.894
	0.098	1.176		2.5	2.391
	0.120	1.391		3.0	2.680
1 1/2" x 1"	0.060	0.966	38.10 x 25.40	1.5	1.438
	0.063	1.010		1.6	1.500
	0.078	1.230		2.0	1.894
	0.098	1.510		2.5	2.389
	0.120	1.800		3.0	2.729
2" x 1"	0.060	1.163	50.8 x 25.40	1.5	1.731
	0.063	1.220		1.6	1.830
	0.078	1.490		2.0	2.220
	0.098	1.840		2.5	2.740
	0.120	2.210		3.0	3.321
2" x 1 1/2"	0.060	1.381	50.8 x 38.10	1.5	2.056
	0.063	1.460		1.6	2.190
	0.078	1.800		2.0	2.717
	0.098	2.240		2.5	3.366
	0.120	2.660		3.0	4.000
2 1/2" x 1 1/2" or 3" x 1"	0.060	1.540	63.50 x 38.10	1.5	2.293
	0.063	1.660		1.6	2.440
	0.078	2.000		2.0	3.031
	0.098	2.550	76.20 x 25.40	2.5	3.760
	0.120	2.950		3.0	4.476
	0.138	3.480		3.5	5.179
	0.156	3.700	4.0	5.868	

Rectangles (continued):

Dimensions and Mass of Rectangle Sections

Imperial			Metric		
Size (inches)	Thickness (inches)	Mass lbs per feet	Size (mm)	Thickness (mm)	kg/m
3" x 1 1/2"	0.060	1.856	76.20 x 38.10	1.5	2.763
	0.063	1.890		1.6	2.810
	0.078	2.290		2.0	3.501
	0.098	2.840		2.5	4.220
	0.120	3.350		3.0	5.178
	0.156	4.230		4.0	6.652
3" x 2"	0.078	2.600	76.20 x 50.80	2.0	3.844
	0.098	3.200		2.5	4.760
	0.120	3.770		3.0	5.610
	0.138	4.380		3.5	6.596
	1.156	4.760		4.0	7.490
	0.177	5.625		4.5	8.371
4" x 2"	0.078	3.100	101.60 x 50.80	2.0	4.587
	0.098	3.840		2.5	5.690
	0.120	4.570		3.0	6.807
	0.138	5.320		3.5	7.897
	0.156	5.820		4.0	8.976
	0.177	6.747		4.5	1-042
4" x 3" or 5" x 2"	0.078	3.660	101.60 x 76.20	2.0	5.538
	0.098	4.520		2.5	6.892
	0.120	5.400	or	3.0	8.230
	0.138	6.270		3.5	9.563
	1.156	6.880	127.00 x 50.80	4.0	10.880
	0.177	8.187		4.5	12.185
0.197	9.056	5.0		13.477	
0.236	10.760	6.0		16.025	
5" x 3"	0.078	4.210	127.00 x 76.20	2.0	6.160
	0.098	5.230		2.5	7.790
	0.120	6.210		3.0	9.116
	0.138	7.200		3.5	10.650
	1.156	7.940		4.0	12.120
	0.177	9.125		4.5	13.580
	0.197	10.106		5.0	15.040
	0.236	12.080		6.0	17.880

## Squares:

## Dimensions and Mass of Square Sections

Imperial			Metric		
Size (inches)	Thickness (inches)	Mass lbs per feet	Size (mm)	Thickness (mm)	kg/m
3/4" x 3/4"	0.060	0.575	19.05 x 19.05	1.5	0.857
	0.063	0.577		1.6	0.939
	0.078	0.700		2.0	1.040
1" x 1"	0.060	0.752	25.40 x 25.40	1.5	1.120
	0.063	0.793		1.6	1.180
	0.078	0.961		2.0	1.430
	0.098	1.176		2.5	1.750
	0.120	1.391		3.0	2.070
1 1/4" x 1 1/4"	0.060	0.976	31.75 x 31.75	1.5	1.453
	0.063	1.010		1.6	1.820
	0.078	1.230		2.0	1.894
	0.098	1.510		2.5	2.250
	0.120	1.800		3.0	2.680
1 1/2" x 1 1/2"	0.060	1.166	38.10 x 38.10	1.5	1.736
	0.063	1.220		1.6	1.787
	0.078	1.490		2.0	2.220
	0.098	1.840		2.5	2.740
	0.120	2.210		3.0	3.290
2" x 2"	0.060	1.545	50.80 x 50.80	1.5	2.300
	0.063	1.660		1.6	2.470
	0.072	1.850		2.0	3.610
	0.098	2.550		2.5	3.829
	0.120	2.950		3.0	4.470
	0.138	3.480		3.5	5.170
	0.156	3.700		4.0	5.860
	0.177	4.394		4.5	6.540

Squares (continued):

Dimensions and Mass of Square Sections

Imperial			Imperial		
Size (inches)	Thickness (inches)	Mass lbs per feet	Size (mm)	Thickness (mm)	kg/m
2 1/2" x 2 1/2"	0.072	2.600	63.50 x 63.50	2.0	3.870
	0.098	3.200		2.5	4.760
	0.120	3.770		3.0	5.610
	0.138	4.380		3.5	6.520
	0.156	4.760		4.0	7.080
	0.177	5.625		4.5	8.371
3" x 3"	0.072	3.104	76.2 x 76.2	2.0	4.620
	0.098	3.840		2.5	5.720
	0.120	4.570		3.0	6.810
	0.138	5.320		3.5	7.901
	0.156	5.820		4.0	8.600
	0.177	6.742		4.5	10.034
1 1/4" x 1 1/4"	0.078	4.210	101.6 x 101.6	2.0	6.270
	0.098	5.230		2.5	7.790
	0.120	6.210		3.0	9.232
	0.138	7.200		3.5	10.720
	0.156	7.940		4.0	12.380
	0.177	9.125		4.5	13.580
	0.188	10.099		5.0	15.030
	0.236	12.080		6.0	17.900

TUBE & PIPE

**Scope:**

Steel tubes for Non-Pressured Applications

- General Engineering and Structural Applications

**Technical Information:**

All material that complies with S355 MPa (Yield) will be as follows:

- Round - from 60mm and bigger
- Square - from 50mm and bigger
- Rectangle - from 60mm x 40mm and bigger
- Material that gets manufactured with high grade material must be marked accordingly
- Wall Thickness - from 2.5mm and thicker
- Outside Diameter shall not vary more than  $\pm 1\%$  to the Specified Outside Diameter

Note: For all sizes not mentioned, please contact Macsteel Tube & Pipe

**Material:**

- Chemical Composition and Mechanical properties

Grade	Tensile MPa (min)	Yield MPa (min)	Min Elong. %	C % Max	Mn % Max	Si Max	P Max	S Max
General Eng.	*	*	*	0.220	*	*	0.050	0.050
Structural S275	450 - 620	275	20	0.200	1.500	0.035	0.040	0.040
Structural S355	450 - 550	355	22	0.140	1.500	0.15 - 0.25	0.035	0.030

\* Steel Ordered to Chemical Analysis



### Dimensions and Mass of Circular Hollow Sections

Outside Diameter OD (mm)	Wall Thickness (Mass per meter)									
	1.2	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
19.1	0.531	0.688	0.840							
21.3	0.611	0.778	0.953	1.158						
25.4	0.716	0.939	1.154	1.411						
26.9		1.002	1.233	1.502	1.768					
31.8		1.189	1.467	1.817	2.123					
34.1		1.282	1.562	1.942	2.293					
38.1		1.440	1.780	2.192	2.790	3.009	3.364			
42.8		1.628	2.012	2.485	2.944	3.392	3.380	3.827		
48.4		1.846	2.288	2.830	3.358	3.876	4.366	4.872		
50.8		1.940	2.406	3.089	3.533	4.083	4.616	5.169		
60.3		2.317	2.875	3.700	4.224	4.876	5.551	6.154		
63.5		2.440	3.031	3.758	4.472	5.174	5.875	6.541		
76.1		2.942	3.658	4.534	5.416	6.261	7.105	7.939	8.779	10.308
88.9		3.233	4.286	5.327	6.355	7.371	8.375	9.366	10.345	12.172
101.6		3.986	4.908	6.104	7.288	8.460	9.619	10.760	11.911	14.135
114.3			5.534	6.893	8.221	9.555	10.880	12.170	13.465	16.011
127.0			6.165	7.669	9.166	10.660	12.120	13.590	15.044	17.880
139.7					10.110	11.760	13.390	15.000	16.610	19.780
152.4					11.050	12.850	14.640	16.410	18.180	21.660
165.1					11.990	13.950	15.890	17.810	19.740	23.540
177.8					13.000	15.045	17.230	19.340	21.308	25.217
193.7					14.130	16.440	18.530	21.030	23.300	27.820
219.1					15.778	18.766	21.010	23.810	26.425	31.530

### Dimensions and Mass of Square Hollow Sections

Outside Diameter Size (mm)	Wall Thickness (Mass per meter)									
	1.2	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0
16 x 16 (15.88)	0.56	0.69								
19 x 19 (19.05)	0.53	0.88	1.09							
25 x 25 (25.40)	0.92	1.19	1.47	1.80	2.13					
32 x 32 (31.75)	1.16	1.52	1.87	2.31	2.74					
38 x 38 (38.10)	1.41	1.85	2.29	2.83	3.36					
50 x 50 (50.80)		2.44	3.03	3.76	4.48	5.18	5.87	6.55		
60 x 60 (60.30)		2.94	3.66	4.54	5.42	6.28	7.12	7.96		
63 x 63 (63.50)		3.09	3.85	4.78	5.70	6.60	7.50	8.38		
75 x 75 (76.20)		3.69	4.59	5.70	6.81	7.90	8.98	10.00		
100 x 100 (101.60)			6.17	7.68	9.17	10.70	12.10	13.60	15.00	17.90
120 x 120 (120.00)					11.10	12.90	14.60	16.40	18.20	21.70
150 x 150 (150.00)					14.13	16.27	18.75	21.03	23.30	27.82

### Dimensions and Mass of Rectangular Hollow Sections

Outside Diameter Size (mm)	Wall Thickness (Mass per meter)									
	1.6	2.0	2.5	3.0	3.5	4.0	4.5	5.0	6.0	
25 x 12	0.88	1.09								
31 x 15	1.19	1.47								
38 x 19	1.44	1.78								
38 x 25	1.52	1.87	2.31							
50 x 25	1.85	2.29	2.83	3.36						
50 x 38	2.19	2.72	3.37	4.01						
60 x 40	2.44	3.03	3.76	4.48						
63 x 38	2.44	3.03	3.76	4.48	5.18					
76 x 25	2.44	3.03	3.76	4.48	5.18	5.87				
76 x 38	2.82	3.50	4.35	5.18	6.00	6.81				
76 x 50	3.09	3.85	4.78	5.69	6.60	7.50	8.38			
100 x 50	3.69	4.59	5.70	6.81	7.90	8.98	10.00			
127 x 76		6.16	7.67	9.12	10.65	12.12	13.58			
120 x 80			7.68	9.17	10.70	21.10	13.60	15.00	17.90	
150 x 100				11.04	12.84	14.63	16.40	18.16	21.64	
160 x 80				11.10	12.90	14.60	16.40	18.20	21.70	
200 x 100					16.40	18.21	21.00	22.87	27.80	

**Scope:**

Steel Tubes for Rolls for Conveyor Belt Idlers

Grade	Chemical Composition			Mechanical Properties		
	C Max	S Max	P Max	Yield MPa Min	Tensile MPa Min	Elongation % Min
230	0.25	0.06	0.06	230	230	10

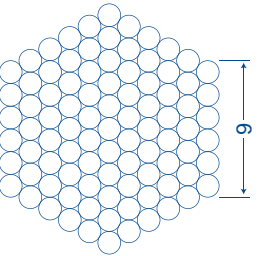
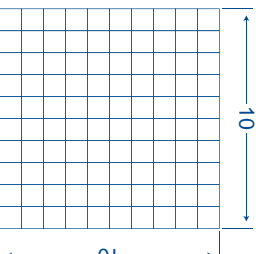
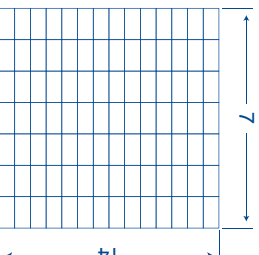
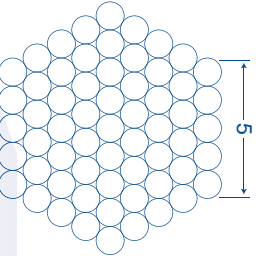
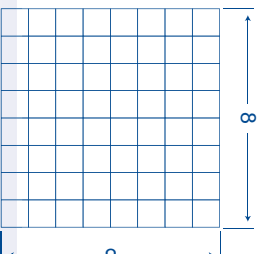
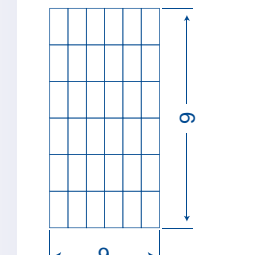
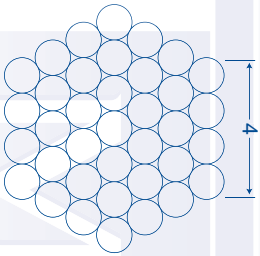
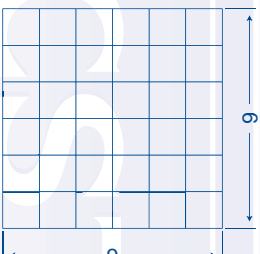
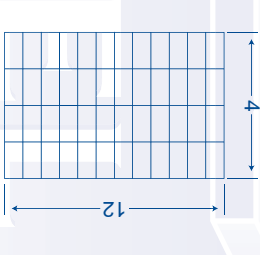
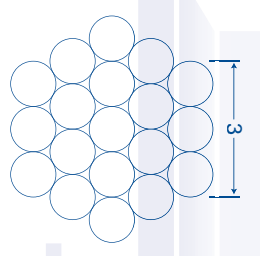
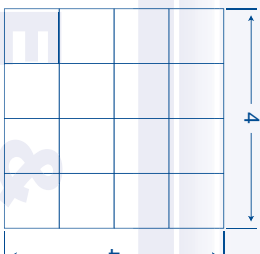
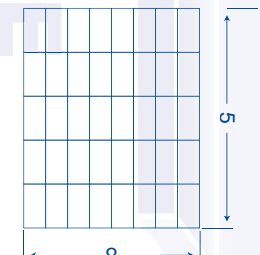
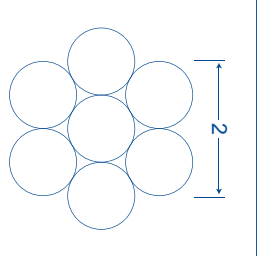
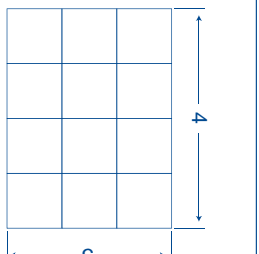
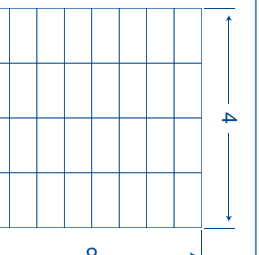
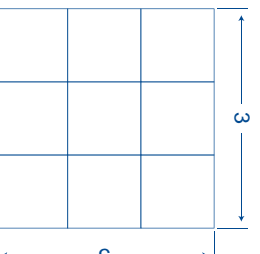
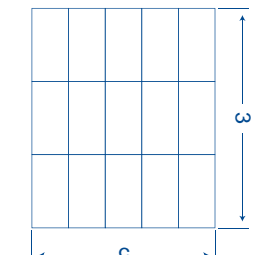
**Technical Information:**

**Scarfig:** The inner and outer weld protrusion shall be removed by scarfig. The outer scarfig shall blend smoothly with the outer diameter of the tube and shall not protrude above the tube by more than 0.1mm or indent within the wall of the tube by more than 0.1mm. Similarly, the inner scarfig shall not stand proud of the tube wall by more than 0.1mm or indent within the wall of the tube by more than 0.35mm.

Diameter mm	Outside Diameter		Nominal Diameter Size mm	Wall Thickness kg/m	Mass kg/m
	Min (mm)	Max mm			
101.6	101.4	101.8	101	3.5	8.47
127.0	126.8	127.2	127	3.8	11.55
127.0	126.8	127.2	127	4.5	13.59
127.0	126.8	127.2	127	6.0	17.90
152.4	152.2	152.6	152	4.0	14.64
152.4	152.2	152.6	152	6.0	21.66
158.8	158.6	159.0	159	4.0	15.14
165.1	164.9	165.3	165	4.5	17.82
165.1	164.9	165.3	165	6.0	23.54
177.8	177.6	178.1	178	6.0	25.42
193.7	193.40	194.00	194	6.0	27.77
219.1	218.90	219.40	219	6.0	31.53

- Tubes up to and including 4.5mm wall thickness are subject to a mill rolling tolerance of  $\pm 0.2$ mm.
- Tubing above 4.5mm wall thickness is subject to a mill rolling tolerance of  $\pm 0.28$ mm.
- All measurements to be taken 150mm from the end of the tube.
- Equipment available to cut and chamfer Conveyor Idlers.

**Equivalent International Specification:**  
**ASTM 513 / AS 1163 / BS 6323 Pt 5**

<b>Rounds</b> SABS 657 I + III, SABS 719	<b>Squares</b> SABS 657 I	<b>Rectangles</b> SABS 657 I
Bundle Configuration by Quantity	Bundle Configuration by Quantity	Bundle Configuration by Quantity
Sizes O/D	Sizes	Sizes
<b>91</b> 	<b>100</b> 	<b>98</b> 
12.7 15.8 19.0 20.0 21.0 21.3 25.4 27.3 31.7 32.0 34.1 38.1	12.7 15.9 19.0 25.4 32.0 38.1	25.12 50.25
<b>61</b> 	<b>64</b> 	<b>54</b> 
42.4 48.5 50.8	40.0 44.5 50.8	60x40
<b>37</b> 	<b>36</b> 	<b>48</b> 
57.1 60.3 63.5 73.0 76.2	60.3 63.5 76.2	76x25
<b>19</b> 	<b>16</b> 	<b>40</b> 
57.1 60.3 63.5 73.0 76.2	80.0 90.0 101.6	76x38 76x50
<b>7</b> 	<b>12</b> 	<b>32</b> 
139.0 152.0 159.0 165.1 174.6 177.0 193.0 219.1	120.0	80x40 100x50 120x60 150x50
	<b>9</b> 	<b>15</b> 
	150.0	127x76 120x80 150x100 200x100 160x80

**NOTES:**

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