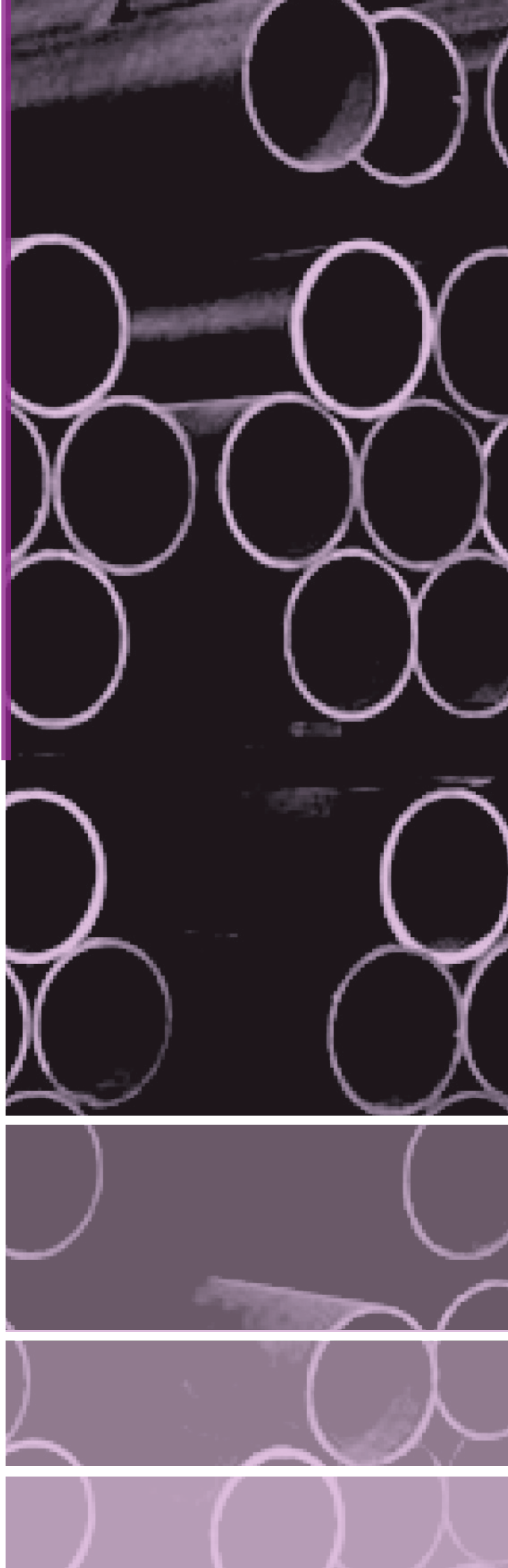


# STEEL PIPES



7e) Non-Alloy Steel Tubes Suitable For Welding And Threading

- Technical delivery conditions
- British Standard (Extracts from BS EN 10255 : 2004)

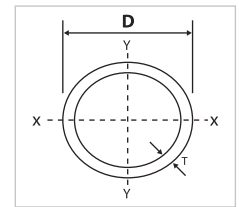
<b>General Information</b>	This document specifies the requirements for circular non-alloy steel tubes suitable for welding and threading and provides a number of options for the finish of tube ends and coatings. This document covers tubes of specified outside diameter 10.2mm to 165.1mm (thread size 1/8 to 6) in two series, medium and heavy, and three types of designated thickness.																		
<b>Chemical Composition</b>	<p>The chemical composition shall conform to the requirements of Table 1.</p> <p>Table 1. Chemical composition</p> <table border="1" data-bbox="403 566 1355 734"> <thead> <tr> <th colspan="2">Steel Grade</th> <th colspan="4">Chemical Composition %</th> </tr> <tr> <th>Steel Name</th> <th>Steel Number</th> <th>C max</th> <th>Mn max</th> <th>P max</th> <th>S max</th> </tr> </thead> <tbody> <tr> <td>S 195T</td> <td>1.0026</td> <td>0.20</td> <td>1.40</td> <td>0.035</td> <td>0.030</td> </tr> </tbody> </table>	Steel Grade		Chemical Composition %				Steel Name	Steel Number	C max	Mn max	P max	S max	S 195T	1.0026	0.20	1.40	0.035	0.030
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S 195T	1.0026	0.20	1.40	0.035	0.030														
<b>Mechanical Strength (Tensile Test)</b>	<p>The mechanical properties shall conform to the requirements of Table 2.</p> <p>Table 2. Mechanical properties</p> <table border="1" data-bbox="403 880 1355 1055"> <thead> <tr> <th colspan="2">Steel Grade</th> <th colspan="3">Mechanical Properties</th> </tr> <tr> <th>Steel Name</th> <th>Steel Number</th> <th>Upper Yield Strength (MPa)</th> <th>Tensile Strength (Mpa)</th> <th>Elongation min %</th> </tr> </thead> <tbody> <tr> <td>S 195T</td> <td>1.0026</td> <td>195</td> <td>320 to 520</td> <td>20</td> </tr> </tbody> </table>	Steel Grade		Mechanical Properties			Steel Name	Steel Number	Upper Yield Strength (MPa)	Tensile Strength (Mpa)	Elongation min %	S 195T	1.0026	195	320 to 520	20			
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S 195T	1.0026	195	320 to 520	20															
<b>Bending Test</b>	<p>The bend test shall be applied to bare tube with specified outside diameter (D) of 17.2 mm up to and including 60.3 mm and shall be carried out to an angle of 90°.</p> <p>The groove in the forming tool shall have a width that fits the tube diameter accurately and a depth not less than 0.5 D. The radius at the bottom of the groove of the former shall be as given in Table 3.</p> <p>Welded tubes shall be bent with the weld at the outside of the bend and tubes shall show no crack visible without magnifying aids.</p> <p>Table 3 – Specified outside diameter (D) and corresponding bending radius</p> <table border="1" data-bbox="308 1375 1453 1453"> <thead> <tr> <th>D</th> <th>17.2</th> <th>21.3</th> <th>26.9</th> <th>33.7</th> <th>42.4</th> <th>48.3</th> <th>60.3</th> </tr> </thead> <tbody> <tr> <td>Bending Radius</td> <td>50</td> <td>65</td> <td>85</td> <td>100</td> <td>150</td> <td>170</td> <td>220</td> </tr> </tbody> </table> <p style="text-align: right;">Dimension in millimeters</p>	D	17.2	21.3	26.9	33.7	42.4	48.3	60.3	Bending Radius	50	65	85	100	150	170	220		
D	17.2	21.3	26.9	33.7	42.4	48.3	60.3												
Bending Radius	50	65	85	100	150	170	220												
<b>Cold Flattening Test</b>	<p>The flattening test shall be applied to bare tubes with specified outside diameter (D) greater than 60.3mm. Welded tubes shall be flattened with the weld placed alternately at 0° or 90° (12 or 3 o'clock) to the direction of the flattening.</p> <p>The tube section shall be flattened in a press until the distance between platens, measured under load, reaches 75% if the original outside diameter of the tube. The tube shall show no cracks or flaws visible without magnifying aids.</p> <p>No cracks or flaws visible without magnifying aids shall occur in the metal other than in the weld until the distance between platens, measured under load, reaches 60% of the original outside diameter.</p>																		
<b>Leak Tightness Test</b>	<p>Each tube shall be tested for leak-tightness. The test can be either a hydrostatic test at a minimum of 50 bar for at least 5s,</p> <p>or an electro-magnetic test.</p>																		

The tolerances on dimensions shall be as specified in Table 4.

Table 4. Tolerance on dimensions

Dimension Of Steel Tubes	Tolerance	
Outside Diameter	Type L	Refer to Table L
	Type L1	Refer to Table L1
	Type L2	Refer to Table L2
	Medium	Refer to Table M
	Heavy	Refer to Table H
Thickness	Type L	± 10 %
	Type L1	- 8 % with the plus tolerance limited by the mass tolerance
	Type L2	- 8 % with the plus tolerance limited by the mass tolerance
	Medium	± 10 %
	Heavy	± 10 %
Length	$L \leq 6$	- 0, + 10 mm
	$6 < L \leq 12$	- 0, + 15 mm
	$L > 12$	- 0, + <i>by agreement</i> mm
Straightness	Shall not exceed 0.20 %	
Out-of-roundness ( $\rho$ )	Included in the diameter tolerance	
Concavity / convexity	-	
Radius of Corners	-	
Squareness of side	-	
Twist	-	
Inner Flash	Height of the internal weld seam shall not exceed 60% of the specified wall thickness	
End tolerance on diameter	-	
End Facing	-	
Mass ( $m$ ) per unit length	Type L	± 7.5 %
	Type L1	- 8 %, + 10 %
	Type L2	- 8 %, + 10 %
	Medium	± 7.5 %
	Heavy	± 7.5 %

Tolerances  
On  
Dimensions  
and Mass



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Dimension and Mass

Table L. Dimension Of Steel Tubes: L						
Specified Outside Diameter (mm) D	Designation Of Thread R	Outside Diameter (D)		Thickness T mm	Mass Per Unit Length Of Bare Tube	
		min. mm	max. mm		Plain End Kg/m	Screwed End Socketed Kg/m
13.5	1/4	13.2	13.9	2.0	0.567	0.571
17.2	3/8	16.7	17.4	2.0	0.750	0.756
21.3	1/2	21.0	21.7	2.3	1.080	1.090
26.9	3/4	26.4	27.1	2.3	1.400	1.410
33.7	1	33.2	34.0	2.9	2.200	2.220
42.4	1 1/4	41.9	42.7	2.9	2.820	2.850
48.3	1 1/2	47.8	48.6	2.9	3.250	3.290
60.3	2	59.6	60.7	3.2	4.510	4.580
76.1	2 1/2	75.2	76.0	3.2	5.750	5.870
88.9	3	87.9	88.7	3.2	6.760	6.930
101.6	3 1/2	100.3	101.2	3.6	8.700	8.880
114.3	4	113.0	113.9	3.6	9.830	10.10
139.7	5	138.5	140.8	4.5	15.00	15.50
165.1	6	163.9	166.5	4.5	17.80	18.40

Table L1. Dimension Of Steel Tubes: L1						
Specified Outside Diameter (mm) D	Designation Of Thread R	Outside Diameter (D)		Thickness T mm	Mass Per Unit Length Of Bare Tube	
		min. mm	max. mm		Plain End Kg/m	Screwed End Socketed Kg/m
13.5	1/4	13.2	13.9	2.0	0.570	0.574
17.2	3/8	16.7	17.4	2.0	0.742	0.748
21.3	1/2	21.0	21.7	2.3	1.080	1.090
26.9	3/4	26.4	27.1	2.3	1.390	1.400
33.7	1	33.2	34.0	2.9	2.200	2.220
42.4	1 1/4	41.9	42.7	2.9	2.820	2.850
48.3	1 1/2	47.8	48.6	2.9	3.240	3.280
60.3	2	59.6	60.7	3.2	4.490	4.560
76.1	2 1/2	75.2	76.3	3.2	5.730	5.850
88.9	3	87.9	89.4	3.6	7.550	7.720
114.3	4	113.0	114.9	4.0	10.80	11.10

Specified Outside Diameter (mm) D	Designation Of Thread R	Outside Diameter		Thickness T mm	Mass Per Unit Length Of Bare Tube	
		min. mm	max. mm		Plain End Kg/m	Screwed End Socketed Kg/m
13.5	1/4	13.2	13.6	1.8	0.515	0.519
17.2	3/8	16.7	17.1	1.8	0.670	0.676
21.3	1/2	21.0	21.4	2.0	0.947	0.956
26.9	3/4	26.4	26.9	2.3	1.38	1.39
33.7	1	33.2	33.8	2.6	1.98	2.00
42.4	1 1/4	41.9	42.5	2.6	2.54	2.57
48.3	1 1/2	47.8	48.4	2.9	3.23	3.27
60.3	2	59.6	60.2	2.9	4.08	4.15
76.1	2 1/2	75.2	76.0	3.2	5.71	5.83
88.9	3	87.9	88.7	3.2	6.72	6.89
114.3	4	113.0	113.9	3.6	9.75	10.0

Specified Outside Diameter (mm) D	Designation Of Thread R	Outside Diameter		Thickness T mm	Mass Per Unit Length Of Bare Tube	
		min. mm	max. mm		Plain End Kg/m	Screwed End Socketed Kg/m
10.2	1/8	9.8	10.6	2.0	0.404	0.407
13.5	1/4	13.2	14.0	2.3	0.641	0.645
17.2	3/8	16.7	17.5	2.3	0.839	0.845
21.3	1/2	21.0	21.8	2.6	1.210	1.220
26.9	3/4	26.5	27.3	2.6	1.560	1.570
33.7	1	33.3	34.2	3.2	2.410	2.430
42.4	1 1/4	42.0	42.9	3.2	3.100	3.130
48.3	1 1/2	47.9	48.8	3.2	3.560	3.600
60.3	2	59.7	60.8	3.6	5.030	5.100
76.1	2 1/2	75.3	76.6	3.6	6.420	6.540
88.9	3	88.0	89.5	4.0	8.360	8.530
114.3	4	113.1	115.0	4.5	12.20	12.50
139.7	5	138.5	140.8	5.0	16.60	17.10
165.1	6	163.9	166.5	5.0	19.80	20.40

Specified Outside Diameter (mm) D	Designation Of Thread R	Outside Diameter		Thickness T mm	Mass Per Unit Length Of Bare Tube	
		min. mm	max. mm		Plain End Kg/m	Screwed End Socketed Kg/m
10.2	1/8	9.8	10.6	2.6	0.487	0.490
13.5	1/4	13.2	14.0	2.9	0.765	0.769
17.2	3/8	16.7	17.5	2.9	1.020	1.030
21.3	1/2	21.0	21.8	3.2	1.440	1.450
26.9	3/4	26.5	27.3	3.2	1.870	1.880
33.7	1	33.3	34.2	4.0	2.930	2.950
42.4	1 1/4	42.0	42.9	4.0	3.790	3.820
48.3	1 1/2	47.9	48.8	4.0	4.370	4.410
60.3	2	59.7	60.8	4.5	6.190	6.260
76.1	2 1/2	75.3	76.6	4.5	7.930	8.050
88.9	3	88.0	89.5	5.0	10.30	10.50
114.3	4	113.1	115.0	5.4	14.50	14.80
139.7	5	138.5	140.8	5.4	17.90	18.40
165.1	6	163.9	166.5	5.4	21.30	21.90