

# Cold Formed Pipe Sections

## Standard Specifications

Standard Specification	Scope	Grade of Tubes	Chemical Composition Percentage (max. unless range is given)				Mechanical Properties			
			C	Mn	P	S	Condition	Tensile Strength (min.)	Yield Strength (min.)	Elongation (% min.)
			4	5	6	7	8	9 tonf/in <sup>2</sup>	10 tonf/in <sup>2</sup>	11
BS-31	E.R.W Steel Conduits	Class A Plain End	--	--	--	--	As Rolled & Coated G.I Strip			15 (G.L.=8")
BS-980	E.R.W Carbon Steel Pipes for Automobile Purposes	ERW 1	0.20	0.6	0.06	0.06	AsRolled	20	11	20
		ERW 2	0.30	0.6	0.06	0.06		25	15	15
		ERW 3	0.40	0.6	0.06	0.06		30	20	10 (G.L = 4 So)
BS-1139	E.R.W Metal Scaffolding	--	--	0.06	0.06	As Rolled (Black Tubes)	20 - 30	13.5	700/T.S. (ton/in ) (G.L = 4 So)	
BS-1387	E.R.W. Carbon Steel Tubes	Light	--	--	0.06	0.06	As Rolled	33 - 47	--	20 (G.L. = 5.65)
		Medium	--	--	--	--				
		Heavy	--	--	--	--				
BS-1717	E.R.W. Carbon Steel Tubes for Bicycle and Motorcycle Purposes	ERW 101	0.10	0.60	0.06	0.06	As Rolled	20	11	--
		ERW 102	0.20	0.60	0.06	0.06		25	15	--
		ERW 103	0.30	0.60	0.06	0.06		30	20	--
BS-1775	E.R.W. Carbon Steel Tubes for Mechanical Structural and General Engineering Purposes	ERW 11	--	--	0.06	0.06	As Rolled	20	11	700/T.S. (ton/in )
		ERW 16	--	--	0.06	0.06		25	16	(G.L = 4 So)
		ERW 20	--	--	0.06	0.06		30	20	or 600/T.S. (ton/in )
		ERW 23	--	--	0.06	0.06		32	23	(G.L. = 5.65)

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Other Tests		Dimensional Tolerances		
Flattenning (min.)	Bend Test	Hydrostatic Test	On Diameter except for Non-Circular Tubes	On Wall Thickness
12	13	14	15	16
--	6D at 90°	--	+ 0.001" - 0.005"	Noiminal 0.04" - 0.072" Min. 0.036" - 0.068"
Max. 3t			1" & under ± 0.004"	
Max. 5t			Over 1" to 2" ± 0.005"	
Max. 8t	--	--	Over 2" to 2-1/2" ± 0.007"	± 8%
			Over 2-1/2" to 3" ± 0.008"	
			Over 3" to 3-1/2" ± 0.010"	
			Over 3-1/2" to 4" ± 0.012"	
			Over 4" to 4-1/2" ± 0.015"	
--	6D at 180°	--	Only 1.906" ± 0.013" - 0.017"	+ 20% - 10%
Apply for NB>2"	Apply for NB 2"	P=700 lbf/in <sup>2</sup> (50 kgf/cm <sup>2</sup> )	Light Tubes: Table 1	Light Tubes: -8% + not limited
Welded Portion: H=0.75D	Ungalvanized Tubes:		Medium, Heavy Tubes: Table 2	Medium, Heavy Tubes: -10%; + not limited
The Other Side: H=0.6D	6D at 180°; Galvanized Tubes: 8D at 90°			
Max. 3t			1-1/4" & under +0.001"	
Max. 5t			-0.005"	± 8%
Max. 8t			Over 1-1/4" to 1-5/8" +0.002" -0.006"	
H = 3t or 1/2D			1" & under ± 0.006"	
H = 6t or 3/4D	--	--	Over 1" to 2" ± 0.007"	
H = 8t or 7/8D			Over 2" to 2-1/2" ± 0.009"	
H = 6t or 3/4D (whichever is the smaller)			Over 2-1/2" to 3" ± 0.010"	± 8%
			Over 3" to 3-1/2" ± 0.012"	
			Over 3-1/2" to 4" ± 0.014"	
			Over 4" to 4-1/2" ± 0.016"	
			Over 4-1/2" to 5" ± 0.018"	
			Over 5" to 5-1/2" ± 0.020"	
			Over 5-1/2" to 6" ± 0.022"	
			Over 6" to 6-5/8" ± 0.025"	