

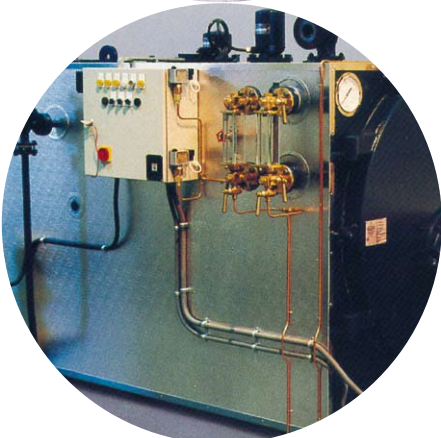
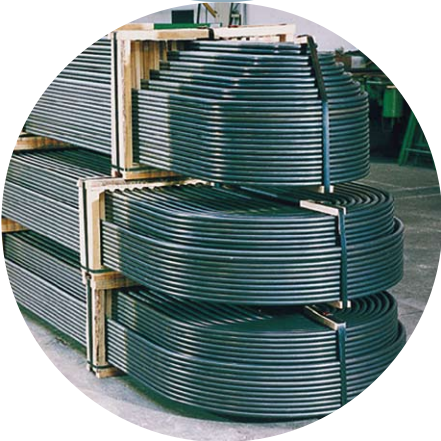


CUSTOMISED SOLUTIONS WORLDWIDE

BENTELER 
Distribution



BOILER TUBES



CHEMICAL COMPOSITION (LADLE ANALYSIS)

SPECIFICATION	C	Mn		Si		P	S
	max. %	min. %	max. %	min. %	max. %	max. %	max. %
Steel grade 320 - HFS	0.16	0.30	0.70	0.10	0.35	0.040	0.040
Steel grade 320 - ERW	0.16*	0.30	0.70	-	0.35	0.040	0.040

* For Rimmed or semi-killed steel the C max is 0.19%

MECHANICAL PROPERTIES AT ROOM TEMPERATURE

SPECIFICATION	Min yield strength Re for tubes with wall thickness up to and including 16mm	Tensile Rm strength		Elongation min
	min. N/mm ²	min. N/mm ²	max. N/mm ²	
Steel grade 320 - HFS	195	320	480	25%
Steel grade 320 - ERW	195	320	480	25%

TOLERANCES

	O.D.	WALL
HFS	±1% with min. tolerance of ±0.50mm	±12.5%
ERW	±0.70% with min. tolerance of ±0.30mm	up to and incl. 3.2mm ±10% over 3.2mm ±7.5%

Tubes are held in stock in lengths up to 12.20 metres or can be supplied in exact lengths.

Full mill certification is available.

All tubes are fully marked.

Tubes can be supplied with swelled ends if requested.

STANDARD STOCK RANGE

O.D.		WALL		WEIGHT kg/m	O.D.		WALL		WEIGHT kg/m		
ins	mm	swg/ins	mm		ins	mm	swg/ins	mm			
1 1/2	38.1	10	3.2	2.75	2 1/2	63.5	10	3.2	4.76		
		8	4.0	3.36			9	3.6	5.32		
		1/4	6.3	4.94			8	4.0	5.87		
1 3/4	44.5	10	3.2	3.26			1/4	6.3	8.89		
		1/4	6.3	5.94			5/16	8.0	10.95		
1 29/32	48.3	10	3.2	3.56			2 3/4	70.0	9	3.6	5.90
		6	6.3	5.34					1/4	6.3	9.90
2	51.0	10	3.2	3.77					5/16	8.0	12.23
		9	3.6	4.21					3/8	9.5	14.17
		8	4.0	4.64	3	76.1			10	3.2	5.75
		1/4	6.3	6.95					9	3.6	6.44
		5/16	8.0	8.48					8	4.0	7.11
		3/8	9.5	9.72	6	5.0			8.77		
2 1/4	57.0	10	3.2	4.25	1/4	6.3			10.84		
		9	3.6	4.74	5/16	8.0	13.44				
		1/4	6.3	7.88	3/8	9.5	15.60				
		5/16	8.0	9.67	3 1/2	88.9	8	4.0	8.38		
		3/8	9.5	11.13			1/4	6.3	12.83		
2 3/8	60.3	9	3.6	5.03	4	101.6	8	4.0	9.63		
		6	5.0	6.82							



CARBON AND ALLOY SEAMLESS STEEL BOILER TUBES

WALL THICKNESS mm

O.D. mm	1.50	1.60	1.65	1.80	2.00	2.11	2.30	2.41	2.50	2.60	2.77	2.87	2.90	3.05	3.20	3.40	3.60	3.65	3.91	4.00	4.50	5.00	5.40	5.50	5.60	5.90	6.30	7.10	8.00	8.80	9.00	10.0	11.0	12.5	13.5	14.2			
12.7																																							
15.9																																							
17.2																																							
18.0																																							
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127.0																																							
133.0																																							
139.7																																							
141.3																																							
152.4																																							
159.0																																							
165.1																																							
168.3																																							

COMPARISON OF INTERNATIONAL STANDARDS

GERMANY DIN 17175	UK BRITISH STANDARD	USA ASTM	GENERAL DESCRIPTION
St 35.8	BS 3602 Pt.1 Gr 360 BS 3059 Pt.2 Gr 360	A160 Gr. A	Carbon Steel boiler tubes
		A179 Gr. A	
		A192 Gr. A	
		A53 Gr. A	
St 45.8	BS 3602 Pt.1 Gr 430 BS 3059 Pt.1 Gr 440	A106 Gr. B	
		A210 Gr. A1	
17 Mn 4	BS 3602 Pt.1 Gr 460 BS 3059 Pt.1 Gr 440	A106 Gr. C	
19 Mn 5		A210 Gr. C	
15 Mo 3	BS 3059 Pt.2 Gr 243		0.3% Mo
13 CrMo 44	BS 3604 Gr 620 BS 3059 Pt.2 Gr 620	A213 Gr. T11	1% Cr 1/2 Mo
		A355 Gr. P11	
10 CrMo 9 10	BS 3604 Gr 622	A355 Gr. P11	21/4% Cr 1 Mo
14 MoV 63	BS 3059 Pt.2 Gr 622	A335 Gr. P22	
X20CrMoV12 1	BS 3059 Pt. 2 Gr. 762		12% Cr 1 Mo

This table is for approximate comparison purposes. Full specifications should be thoroughly checked before ordering materials.

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