

Firetube Miter Calcs. Rev.0

Job: BWM-715-18

B31.3 Thickness Calculations

NPS 20.00	OD: 20.000	Wall Thickness: 0.5	Max P.: 632 psi	Tolerance Thickness: 0.438	104.4 lbs/ft
Pipe Schedule:	xh	0.5		0.438	19.000
Pressure:	75 psi	517 kPa		5.2 bar(g)	^Nozzle ID^
C.A.:	0.125	776 kPa	<-Test Pressure	t =	0.0374
No Threads	0	113		t Req'd:	0.1624
f (Pg. 16 - Fatigue)	1.000	< 7,000 Cycles = 1		67.5%	Okay
S_A	30,000			Stress: (PD/(2*(t Tol)))	2,400
S_y Hot:	20,000	Cold 20 ksi C.S.		P/SE	0.004
Y:	0.4	0.492063492		Fig. 323.2.2B	0.120
W: weld reduction	1.00	Table 302.3.4 & 5			
E (quality factor)	1.00	Table A-1A / A-1B		482.6 mm ID	182,921 mm^2
t > D/6 (is t? > C3)	3.33	Steel Area: 30.631 in^2		Area: 1.969 ft^2	

N&C Stress: 1,714 psi

304.2.3 Miter Bends

Angle: 45.00°

1

4a N/A r2: 9.8438"

4b N/A **R1: 13.625"**

4c (Angle > 22.5°) 79 psi Single Piece

M 5.1881" S: 27.2500"

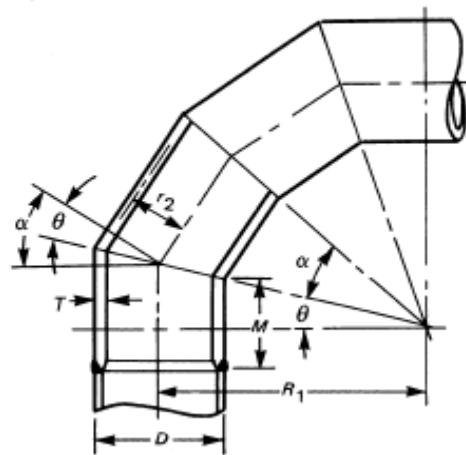
R1 minimum: eq 5 11.000"

Center Length 8.3125"

Horizontal Vector 0.0000 0.0000"

Vertical Vector 1.0000 8.3125"

Fig. 304.2.3 Nomenclature for Miter Bends



Y. Z.

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