

BSI Obround Flange & Blind Flange Rev.1
Job: BWM-715-18

Design Inputs

Design Pressure
Corrosion
Nozzle Thk
Required Thk
Allowable Stress
Flg Short Side OD
Flg Short Side ID
Flg Thk
Flg L-Tang. Distance
Modulus of Elasticity
Bolting at Operating
Bolting at Seating
Bolt Circle Dim. at Short Side
Bolt Number
Bolt Dim.
Bolt Cen. to Cen.n long Side
Gasket ID
Gasket m
Gasket Strength
Weld-Inside Fillet
Weld-Outside Fillet
Flange set back
Blind Flange Thk

p	(psi)	75.00
C.A.	(in)	0.125
tn	(in)	0.75
tr	(in)	0.75
SFO	(psi)	20000.00
Go	(in)	32.000
B	(in)	24.125
t	(in)	1.250
L	(in)	25.500
E	(psi)	2.900E+07
Sa	(psi)	25000
Sb	(psi)	25000
C	(in)	29.000
n		42.000
db	(in)	0.875
BS	(in)	3.625
A1	(in)	26.000
m		1.000
y	(psi)	200.000
f1	(in)	0.750
f2	(in)	0.750
SB	(in)	0.750
t	(in)	1.500

Variables

Bolt Root Area
Bolt Size
TEMA Table D5
TEMA Table D5

2b"=2xb"
g1=f2+tn
g0=tn
d=Size+0.125
Bn=B+2xC.A.
b'o=min((Go-C),(C-A1))
b'=0.79x(sqrt(b'o))
G=C-d-2xb"

Ra	(sq. in)	0.419
db	(in)	0.875
Rb	(in)	0.000
E1	(in)	0.000
b"		0.100
2b"		0.200
g1	(in)	1.500
g0	(in)	0.750
d	(in)	1.000
Bn	(in)	24.375
b'o	(in)	3.000
b'	(in)	1.368
G	(in)	27.800

Loads

H=(0.785x(C-d)^2+(C-d)xL)xp
HD=(0.785xB^2+BxL)xp
HG=(6.28xb"xG+0.4xL)xm xp
HT=H-HD
hD=(C-B-g1)/2
hG=(d+2xb")/2
hT=(C+D+2xb"-B)/4
M=HDxhD+HGxhG+HTxhT
hR=(Go-C-d)/4+d/2
HR=M/Hr
Wm1=HG+H+HR
Wm2=3.14xCxb'xy
Am1=Wm1/Sb
Am2=Wm2/Sa
Am=max(Am1, Am2)
Ab=nxRa
W=(Am1+Ab)xSa/2
TG=(HT+HG+W)
Preload=TG/n
tmin=SQRT((6*M)/(SFOx3.14xC-nxd))

H	(lb)	99708.0
HD	(lb)	80405.2
HG	(lb/in)	2074.4
HT	(lb)	19302.8
hD	(in)	1.688
hG	(in)	0.600
hT	(in)	1.519
M	(lb.in)	166244.536
Hr	(in)	1.000
HR	(lb)	166244.5
Wm1	(lb)	268026.9
Wm2	(lb)	24919.8
Am1	(sq in)	10.721
Am2	(sq in)	0.997
Am	(sq in)	10.721
Ab	(sq in)	17.598
W	(lb)	353988.5
TG	(lb)	375365.6
Pr	(lb)	8937.3
t min	(in)	1.008

Blind Flange Calcs.(ASME VIII. DIV1, UG-34(5))

C=0.25
d
D
Z=3.4-2.4xd/D
L
tmin=d(ZCP/SE+6WhG/SELD^2)^0.5+C.A
Check t->tim

C		0.25
d	(in)	24.125
D	(in)	49.625
Z	(in)	2.23
L	(in)	142.106
t	(in)	1.416
Check t		Acceptable

Check

Check- t>tmin
tBS=((BS-2xSize)x(m+0.5))/(6*(E/200000)^0.25)
Check-t> t BS

Check t	Acceptable
tBS	(in) 0.135
Check t	Acceptable

Geometry Constraints

tx=max(trx2, 0.25)
c=min(tn,tx)
mtc=0.7*c
Check f1-0.7 f1>=mtc
Check f2-0.7 f2>=mtc
Check Welds 1-tn>=f1
Check Welds 1-tn>=f2
Min SB=c Min Set Back
Max SB=c+0.25 Max Set Back
Check SB 1>=Min SB
Check SB2<=Max SB

tx	(in)	1.500
c	(in)	0.75
mtc	(in)	0.525
Check f1		Acceptable
Check f2		Acceptable
Check f1		Acceptable
Check f2		Acceptable
Min SB		0.75
Max SB		1.00
Check SB1		Acceptable
Check SB2		Acceptable

Y. Z.

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