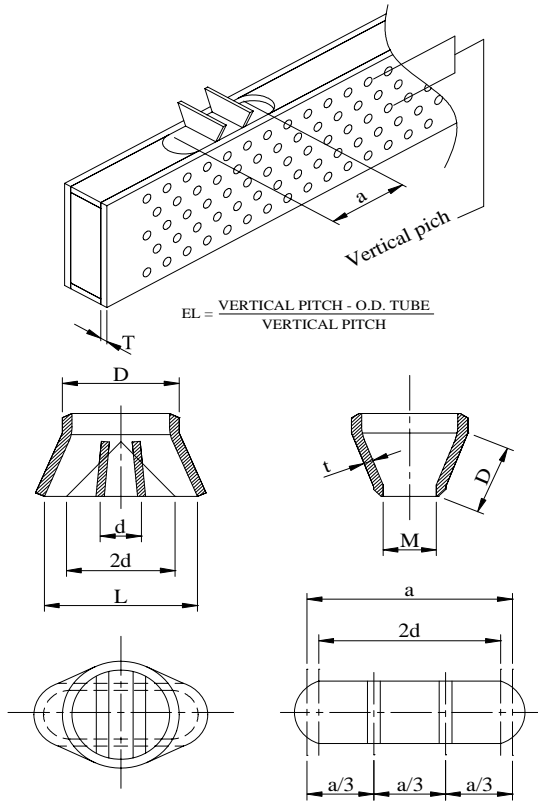


SWAGED NOZZLE CALCULATION



DESIGN DATA:

P = Design pressure (barg)
C₁ = Corrosion Allowance (mm)
NP = Inlet Nozzle Size (in)
Nozzle Material
S_n = Nozzle Allowable stress (N/mm²)
Nozzle Thickness (mm)
Stiffener Material
S_r = Stiffener Allowable stress (N/mm²)
t_r = Stiffener Thickness (mm)
E_r = Weld Joint efficiency of Stiffener
C₂ = Guarantee Tolerance (mm)
De = External Diameter (mm)
C = Factor UG-34(c)(3)
E = Weld Joint efficiency
Plug Sheet Material
Tensile Allowable Stress (N/mm²)
Bending Allowable Stress (N/mm²)
T = Plug Sheet Thickness (mm)
Holes O.D. (mm)
Vertical Pitch (mm)
E_L = Ligament Efficiency
a/3 = Opening Size (mm)

82
3
8
SA-333
117.9
18.57
SA-516 Gr.70
137.9
12.5
0.55
2.28
219.1
0.33
1.0
SA-516 Gr.70
137.9
206.9
20.0
34.9
115.6
0.70
81.0

(1.5 * S_{tensile})

Size (in)	8.0
L (mm)	230.0
M (mm)	100.0
2d (mm)	130.0
d (mm)	95.0
D (mm)	135.0
R (mm)	50.0
Z (mm)	2.5

	Size(in)			
	6	8	10	12
L	230	230	375	405
M	100	100	100	160
2d	130	130	275	255
d	95	95	137.5	127.5
D	111	135	155	163
R	50	50	60	75
Z	2.5	2.5	2.5	2.5

Check the flat part of the Swaged Nozzle - ASME VIII DIV.1 - UG-34(c)(3)

$$t = (d/3) * \text{SQRT}(Z * P * C / S_n * E) + C_1 + C_2$$

12.87 mm

O.K.

Check the Stiffener of the Nozzle

$$t_r = ((P * d) / (3 * S_r * E_r)) + 2 * C_1$$

9.42 mm

O.K.

Check the Cylindrical part of the Nozzle - ASME VIII Div. 1 -App. 1

$$t = (P * D_o / 2) / (S_n * E + 0.4P) + C_1 + C_2$$

12.69 mm

O.K.

Check the Header Nozzle Opening- ASME VIII Div. 1 -U-2(g)

Bending Moment (Semiclamped Beam)

$$M = (1/16) * P * (a/3)^2$$

3,363 N.mm

$$S_b = 6 * M / ((T - C_1)^2 * E_L)$$

100.0 N.mm²

Sb <= Bending Allowable Stress, So The assumed Thicknesses are O.K.