

TUBE CONFIGURATION (External Pressure)

Inner Diameter : 7.5000 in
 Outer Diameter : 8.5000 in
 Wall Thickness : 0.50000 in
 Tube Length : 11.000 in

Weight in air : 22.117 lbs
 Weight in water: -1.0034 lbs

Failure Mode: Shell failure at 15.215 Ksi (Thick wall eq's)

Thin Wall Buckling at 28.016 Ksi by 3 nodes
 Seat failure N/A
 Shear failure N/A

TITANIUM, Ti-6Al-4V Properties:

Yield Strength : 119 Ksi
 Elastic Modulus : 16 Mpsi
 Density : 0.16 lb/cu in
 Poisson's Ratio : 0.31
 Comments :
 Annealed Condition Compressive Young's Modulus =
 16.4 Mpsi

Tube distortion values:

Pressure Ksi	Depth m (sea)	Max Axial Stress, Ksi	Max Hoop Stress, Ksi	Max Equiv Stress, Ksi	d ID Inches
1.0000	685.44	-4.5156	-9.0313	7.8213	-0.0035772
2.0000	1368.8	-9.0313	-18.063	15.643	-0.0071544
3.0000	2050.1	-13.547	-27.094	23.464	-0.010732
4.0000	2729.4	-18.063	-36.125	31.285	-0.014309
5.0000	3406.7	-22.578	-45.156	39.106	-0.017886
6.0000	4082.0	-27.094	-54.188	46.928	-0.021463
7.0000	4755.3	-31.609	-63.219	54.749	-0.025041
8.0000	5426.6	-36.125	-72.250	62.570	-0.028618
9.0000	6096.0	-40.641	-81.281	70.392	-0.032195
10.000	6763.5	-45.156	-90.313	78.213	-0.035772
11.000	7429.0	-49.672	-99.344	86.034	-0.039349
12.000	8092.7	-54.188	-108.38	93.856	-0.042927
13.000	8754.4	-58.703	-117.41	101.68	-0.046504
14.000	9414.3	-63.219	-126.44	109.50	-0.050081
15.000	10072	-67.734	-135.47	117.32	-0.053658
15.215*	10214	-68.705	-137.41	119.00	-0.054427
16.000*	10729	-72.250	-144.50	125.14	-0.057236
17.000*	11383	-76.766	-153.53	132.96	-0.060813
18.000*	12036	-81.281	-162.56	140.78	-0.064390
19.000*	12686	-85.797	-171.59	148.60	-0.067967
20.000*	13336	-90.313	-180.63	156.43	-0.071544

* = after housing failure

Tube distortion values:

d OD Inches	d Length Inches
-0.0033582	-0.0011797
-0.0067165	-0.0023594
-0.010075	-0.0035391
-0.013433	-0.0047188
-0.016791	-0.0058985
-0.020149	-0.0070782
-0.023508	-0.0082579
-0.026866	-0.0094377
-0.030224	-0.010617
-0.033582	-0.011797
-0.036941	-0.012977
-0.040299	-0.014156
-0.043657	-0.015336
-0.047015	-0.016516
-0.050374	-0.017696
-0.051095	-0.017949
-0.053732	-0.018875
-0.057090	-0.020055
-0.060448	-0.021235
-0.063807	-0.022414
-0.067165	-0.023594

* = after housing failure