

TUBE CONFIGURATION (External Pressure)

Inner Diameter : 5.2500 in
 Outer Diameter : 5.8750 in
 Wall Thickness : 0.31250 in
 Tube Length : 16.000 in

Weight in air : 6.4205 kg
 Weight in water: -0.86670 kg

Failure Mode: Thin Wall Buckling at 8837.1 psi by 2 nodes

Shell failure at 12794 psi (Thick wall eq's)
 Seat failure N/A
 Shear failure N/A

TITANIUM, Ti-5Al-2.5 Sn Properties:

Yield Strength : 110 Ksi
 Elastic Modulus : 15.5 Mpsi
 Density : 0.162 lb/cu in
 Poisson's Ratio : 0.31
 Comments :
 Annealed Condition

Tube distortion values:

Pressure Kbar	Depth m (sea)	Max Axial Stress, psi	Max Hoop Stress, psi	Max Equiv Stress, psi	d ID cm
0.068948	685.44	-4964.0	-9928.1	8598.0	-0.0072174
0.13790	1368.8	-9928.1	-19856	17196	-0.014435
0.20684	2050.1	-14892	-29784	25794	-0.021652
0.27579	2729.4	-19856	-39712	34392	-0.028870
0.34474	3406.7	-24820	-49640	42990	-0.036087
0.41369	4082.0	-29784	-59569	51588	-0.043305
0.48263	4755.3	-34748	-69497	60186	-0.050522
0.55158	5426.6	-39712	-79425	68784	-0.057740
0.60930*	5987.1	-43868	-87736	75981	-0.063781
0.62053*	6096.0	-44676	-89353	77382	-0.064957
0.68948*	6763.5	-49640	-99281	85980	-0.072174
0.75842*	7429.0	-54604	-109210	94578	-0.079392
0.82737*	8092.7	-59569	-119140	103180	-0.086609
0.89632*	8754.4	-64533	-129070	111770	-0.093827
0.96527*	9414.3	-69497	-138990	120370	-0.10104
1.0342*	10072	-74461	-148920	128970	-0.10826
1.1032*	10729	-79425	-158850	137570	-0.11548
1.1721*	11383	-84389	-168780	146170	-0.12270
1.2411*	12036	-89353	-178710	154760	-0.12991
1.3100*	12686	-94317	-188630	163360	-0.13713
1.3790*	13336	-99281	-198560	171960	-0.14435

* = after housing failure

Tube distortion values:

d OD cm	d Length cm
-0.0068155	-0.0049459
-0.013631	-0.0098917
-0.020446	-0.014838
-0.027262	-0.019783
-0.034077	-0.024729
-0.040893	-0.029675
-0.047708	-0.034621
-0.054524	-0.039567
-0.060229	-0.043707
-0.061339	-0.044513
-0.068155	-0.049459
-0.074970	-0.054404
-0.081786	-0.059350
-0.088601	-0.064296
-0.095417	-0.069242
-0.10223	-0.074188
-0.10905	-0.079134
-0.11586	-0.084080
-0.12268	-0.089025
-0.12949	-0.093971
-0.13631	-0.098917

* = after housing failure