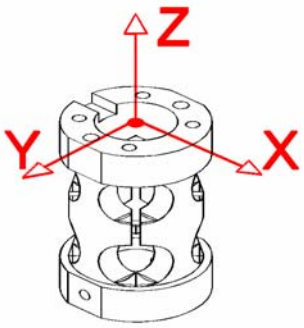
# Model # TFF325 (T5160)

## Extraneous Load Factors




**Equation:** $\sigma_{max} \geq$ (A)Fx +(B)Fy +(C)Fz +(D)Mx +(E)My +(F)Mz

**Material:** Aluminum 2024-T4 (AL*)

| Model# | Capacity (in-oz) | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| TFF325 | 20 (1.25 in-lb) | 2188.00 | 2188.00 | 102.50 | 509.18 | 509.18 | 7888.52 |
| | 50 (3.12 in-lb) | 1272.50 | 1272.50 | 54.82 | 269.01 | 269.01 | 5399.91 |

*When calculating $\sigma_{max}$ for capacities 20-50 in-oz use in-lb & lb units for applied moments and loads, respectively.

| Model# | Capacity (in-lb) | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| TFF325 | 12 | 574.64 | 574.64 | 26.76 | 122.17 | 122.17 | 1495.20 |
| | 50 | 167.71 | 167.71 | 13.52 | 50.69 | 50.69 | 265.89 |
| | 100 | 112.33 | 112.33 | 10.27 | 45.37 | 45.37 | 145.25 |

**$\sigma_{max}$ Table**

| Material | Static Load (=60% Y.S.) | Fatigue (Non Reversing Loads) | Fatigue (Full Reversing Loads) |
|---|---|---|---|
| 2024-T4/T351 | 28,000 | 18,000 | 15,000 |

*Value is 75% of Fatigue Strength based on 10-20 x $10^6$ cycles and allow for factors that influence Fatigue such as surface finish, stress concentrations, corrosion, temperature and other variables for the production of the transducer, for infinite Fatigue Life (100 x $10^6$) use 75% of values shown.

## Sample Calculation for Customer

| Model# | Capacity (in-lb) | Shear Force (lb) | Axial Load (lb) | Moment (in-lb) |
|---|---|---|---|---|
| TFF325 | 50 | 20 (Fx or Fy) | 10 (Fz) | 35 (Mz) |

Given Equation: $\sigma_{max} \geq$ (A)Fx +(B)Fy +(C)Fz +(D)Mx +(E)My +(F)Mz

$\sigma_{max} \geq$ (167.71)*(20) +(167.71)*(0) +(13.52)*(10) +(50.69)*(0) +(50.69)*(0) +(265.89)*(35)

$\sigma_{max} \geq$ (167.71)*(20) + 0 + (13.52)*(10) + 0 + 0 + (265.89)*(35) = 3,234 + 135 + 9,306= 12,675 psi.

$\sigma_{max} \geq$ 12,675 psi.

15,000 psi. $\geq$ 12,675 psi.

Conclusion: The applied loads & moments will more than suffice for the design of the TFF325.