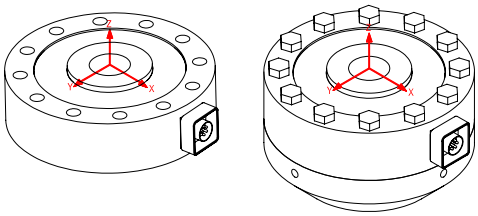
# Extraneous Load Factors

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



**Material:** 17-4 P.H. Stainless Steel

| Model | Capacity (lb) | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|
| *LCF500/LCF505* | *25,000* | 6.5 | 6.5 | 2.6 | 3.7 | 3.7 | 3.4 |
| | *50,000* | 3.3 | 3.3 | 1.2 | 2 | 2 | 1.3 |
| *LCF501/LCF506* | *12,500* | 6.5 | 6.5 | 2.6 | 3.7 | 3.7 | 3.4 |
| | *25,000* | 3.3 | 3.3 | 1.2 | 2 | 2 | 1.3 |

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

| Material | Static Load (=60% Y.S.) | Fatigue (Non Reversing Loads) | Fatigue (Full Reversing Loads) |
|---|---|---|---|
| 17-4PH S.S | 87,000 | 78,000 | 62,000* |

*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.

# Deflection & Natural Frequency

| Model | Capacity (lb) | Deflection (in.) | Natural Frequency (Hz) | $\beta$ |
|---|---|---|---|---|
| *LCF500/LCF505* | *25,000* | *0.002* | *7,100* | *2.37* |
| | *50,000* | *0.003* | *8,200* | *2.38* |
| *LCF501/LCF506* | *12,500* | *0.001* | *7,100* | *2.37* |
| | *25,000* | *0.0015* | *8,200* | *2.38* |

**Natural Frequency & Frequency Response Equation's:**

$$\text{Natural Frequency (FN)} = 3.13\sqrt{\frac{1}{\frac{\beta}{Capacity}\bullet Deflection}}\ \text{(Hz)}$$

$$\text{Frequency Response with load (FR)} = 3.13\sqrt{\frac{1}{\frac{\beta + AppliedLoad}{Capacity}\bullet Deflection}}\ \text{(Hz)}$$

*Where $\beta$ values are obtained by Futek Engineers