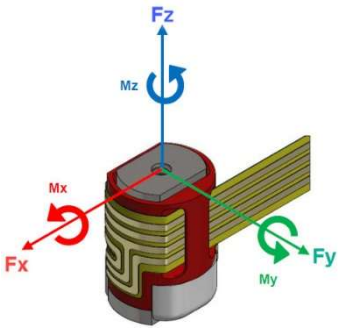
Extraneous Load Factors

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

Material: 17-4 P.H. Stainless Steel



Capacity (lb)	A	B	C	D	E	F
5	*13911*	*12770*	*4636*	*141109*	*201399*	*89968*
10	*7973*	*5799*	*2413*	*88743*	*105463*	*50734*

All Forces to be calculated using lb and in-lb units

σ_{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

Capacity (lb)	Deflection (in.)	Natural Frequency (kHz)	β
5	*0.00005*	*71*	*0.0002*
10	*0.00005*	*98*	*0.0002*

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 β values are obtained by FUTEK Engineers

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