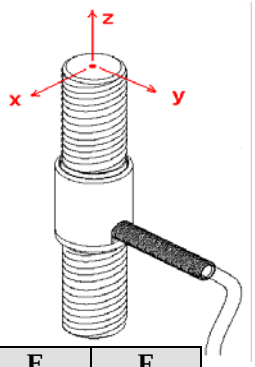
Extraneous Load Factors



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

Material: 17-4 PH Stainless Steel

Model #	Capacity (lb)	A	B	C	D	E	F
LCM500	2,000	1310.90	1310.90	28.75	761.97	761.97	647.97
	5,000	311.02	311.02	12.98	193.95	193.95	148.64
	10,000	185.54	185.54	6.29	71.72	71.72	59.87
	20,000	58.70	58.70	3.37	27.36	27.36	20.50
	50,000	27.14	27.14	1.53	7.49	7.49	5.40

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

Model #	Capacity (lb)	Deflection (in.)	Natural Frequency (Hz)	β
LCM500	2,000	0.002	11,800	0.0700
	5,000	0.003	15,300	0.0700
	10,000	0.003	8,100	0.5000
	20,000	0.004	9,900	0.5000
	50,000	0.005	8,100	1.5000

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