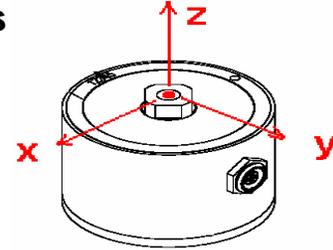**FUTEK**
ADVANCED SENSOR TECHNOLOGY, INC.

Extraneous Load Factors

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

Material: Aluminum 2024-T4 (*AL), 17-4 P.H. Stainless Steel

Model #	Capacity (lb)	A	B	C	D	E	F
LCF300 (*AL)	10	195.52	195.52	638.19	286.81	286.81	373.22
	25	107.80	107.80	252.48	192.76	192.76	161.96
	50	107.80	107.80	258.00	192.76	192.76	161.96
	100	87.33	87.33	131.42	123.81	123.81	122.15
LCF300	100	119.53	119.53	384.85	143.09	143.09	190.01
	250	82.81	82.81	167.15	123.36	123.36	132.06
	500	55.89	55.89	106.78	84.53	84.53	94.15

σ_{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
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
LCF300 (*AL)	10 (*AL)	0.0012	1,100	0.0649
	25 (*AL)	0.0012	1,800	0.0649
	50 (*AL)	0.0025	1,700	0.0649
	100(*AL)	0.0023	2,600	0.0649
LCF300	100	0.0021	1,500	0.1984
	250	0.0026	2,200	0.1984
	500	0.0018	3,700	0.1984

Natural Frequency & Frequency Response Equation's:

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

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

*Where β values are obtained by Futek Engineers

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