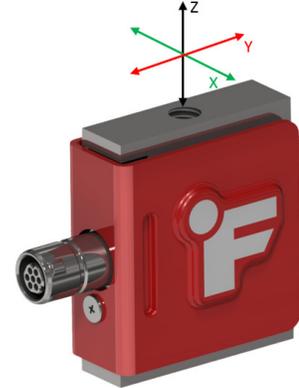FUTEK
ADVANCED SENSOR TECHNOLOGY, INC.

Extraneous Load Factors

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

Material: 17-4 P.H. Stainless Steel

Model#	Capacity (lb**)	A	B	C	D	E	F
LSB205	250g	6168	4916	32699	20223	13331	15335
	1	6168	4916	32699	20223	13331	15335
	2	5163	4851	17710	10103	11064	11739
	5	4933	4730	7801	9855	10668	8338
	10	4772	4529	4590	9421	10377	6972
	25	4215	3872	2602	7919	9171	5167
	50	2055	2276	1185	3584	3728	4017
	100	2038	2289	858	3592	3632	3646

**All capacity values in lb except 250g capacity (grams)

All Force and Moment 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

Model #	Capacity (lb**)	Deflection (in.) (Fz Only)	Natural Frequency (Hz) (Z-Direction Only)	β
LSB205	250g	0.002	690	0.004
	1	0.005	690	0.004
	2	0.004	1180	0.004
	5	0.003	2180	0.004
	10	0.003	3010	0.004
	25	0.003	5380	0.003
	50	0.003	6620	0.003
	100	0.004	8250	0.003

**All capacity values in lb except 250g capacity (grams)

This documentation was generated and completed to the best ability of FUTEK's Engineering Team using FEA Analysis, Empirical data and Multiple Testing Simulations. The information and recommendations on this document are presented in good faith and believed to be correct however, FUTEK Advanced Sensor Technology makes no representations or warranties as to the completeness or accuracy of the information.

Natural Frequency & Frequency Response Equation's:

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

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

*Where β values are obtained by Futek Engineers