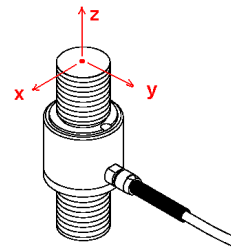


Extraneous Load Factors



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

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

Material	Model #	Capacity (lb)	A	B	C	D	E	F
(AL)	LCM300	25	1200	1200	560	3500	3500	1040
(S.S.)		50	3500	3500	870	8955	8955	7225
		100	3336	3336	530	9050	9050	8345
		250	770	770	220	1955	1955	1380
		500	665	665	150	1420	1420	1250
		1,000	475	475	86	1405	1405	1190
	LCM325	2,000	660	660	30	775	775	610
		3,000	400	400	20	420	420	345
	LCM350	4,000	480	480	16	305	305	225
		5,000	330	330	13	206	206	170
	LCM375	7,500	180	180	10	105	105	78
10,000		120	120	8	75	75	55	

All force and moments to be calculated using lb & in-lb units

σ_{max} **Table**

Material	Static Load (=60% Y.S.)	Fatigue (Non Reversing Loads)	Fatigue (Full Reversing Loads)
2024-T4 AL	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 10⁶ 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 10⁶) use 75% of values shown.

Deflection & Natural Frequency

Model #	Capacity (lb)	Deflection (in.)	Natural Frequency (Hz)	β
LCM300	25	0.0008	8,750	0.004
	50	0.0012	7,500	0.0072
	100	0.0013	10,200	0.0072
	250	0.0013	16,200	0.0072
	500	0.0013	22,900	0.0072
	1,000	0.0015	30,100	0.0072
LCM325	2,000	0.0013	20,100	0.0443
	3,000	0.0014	21,600	0.0443
LCM350	4,000	0.0018	14,200	0.1075
	5,000	0.0021	14,700	0.1075
LCM375	7,500	0.0021	14,100	0.1769
	10,000	0.0025	14,900	0.1769

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:

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

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

*Where β values are obtained by Futek Engineers