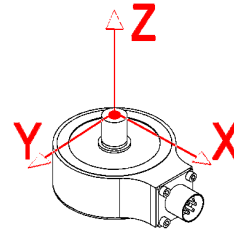


## Extraneous Load Factors

**Equation:**  $\sigma_{\max} \geq (A)F_x + (B)F_y + (C)F_z + (D)M_x + (E)M_y + (F)M_z$



**Material:** 17-4 PH Stainless Steel

Material	Capacity (lb)	A	B	C	D	E	F
(S.S.*)	100	39.9	39.9	190.8	94.0	94.0	59.1
	200	71.5	71.5	168.0	98.9	98.9	88.4
	500	229.4	229.4	89.2	160.8	160.8	187.3
	1,000	113.3	113.3	47.0	187.0	187.0	147.2
	2,000	58.1	58.1	23.0	58.5	58.5	94.0
	3,000	59.4	59.4	11.2	39.2	39.2	44.6
	5,000	56.8	56.8	7.7	44.0	44.0	44.8

\*All Force and Moment to be calculated using lb and in-lb units

### $\sigma_{\max}$ Table

Material	Static Load (=60% Y.S.)	Fatigue (Non Reversing Loads)	Fatigue (Full Reversing Loads)
17-4 PH S.S.	87,000	78,000	62,000*

\*Value is 75% of Fatigue Strength based on 10-20 x 10<sup>6</sup> 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<sup>6</sup>) use 75% of values shown.

## Deflection & Natural Frequency

Capacity (lb)	Deflection (in.)	Natural Frequency (Hz)	$\beta$
100	0.0019	1,700	0.16
200	0.0017	2,600	0.16
500	0.0014	4,500	0.17
1,000	0.0014	6,200	0.18
2,000	0.0012	9,200	0.19
3,000	0.0010	10,000	0.20
5,000	0.0020	10,500	0.22

\*FN results are based on calculation of deflection & weight scene on Sensor arm.

### 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  $\beta$  values are obtained by Futek Engineers