DATA SHEET FOR CALCULATING "E" BY CANTILEVERED BENDING, BUCKLING COLUMNS, OSCILLATING CANTILEVERED BEAMS. OR ACOUSTIC VIBRATION

(TAKE APPROPRIATE DATA)

MATERIAL	WIDTH	THICKNESS	LENGTH	Dia	I	ρ	LOAD	DEFL	MASS	FREQ (f)	E
	mm	mm	mm	mm	mm^4	mm	N	mm	kg	Herz	GPa

USEFUL FORMULAS

$$E = \frac{P\ L^3}{3\ \Delta I}$$

(cantilevered beam)

$$E = \frac{P\ (L/\rho)^2}{C\ A\ \Pi^2}$$

(buckled long column)

$$\rho = \sqrt{I/A}$$

(radius of gyration)

$$E = \frac{(f\ 2\ \Pi)^2\ m^*\ L^3}{3\ I}$$

(oscillating beam)

m* - effective mass being oscillated; also be careful of units

$$I = \frac{Bd^3}{12}$$

(moment of Inertia rectangular section)

$$I = \frac{\Pi d^4}{64}$$

(moment of Inertia round section)

$$E = v^2 \times \rho = [\text{Hz} \times 2 \times \text{len.}]^2 \times \rho$$

(Acoustic method)