

Lab 11: To determine the horizontal deflection and vertical deflection of different curved beams due to point loading.

1/1/2025

By

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Length (L): = $\frac{48}{1000}$ m = 0.048 m

Width of ring (b): = $\frac{27.2}{1000}$ m = 0.0272 m

Height (h): = $\frac{16.7}{1000}$ m = 0.0167 m

M Bending moment
E Modulus of elasticity of beam material 193-203 GPa
I Moment of inertia of the beam
EI Flexural rigidity of beam
L Length of beam

For Ring, Case 01

Dia (d) = $\frac{300}{1000}$ m = 0.3 m Radius = 0.15 m

Horizontal deflection = $\Delta H = \frac{0.114PR^3}{EI}$

Vertical deflection = $\Delta V = \frac{0.149PR^3}{EI}$

Moment of inertia (I) = $I = \frac{bd^3}{12}$ = 6.12E-05 m⁴
E = 2.06E+11 GPa

Sr#	Mass (g)	Mass (kg)	P (N)	Loading		Unloading		Average		ΔH	ΔV
				Vertical Deflection @ Loading	Horizontal deflection @ Loading	Vertical Deflection @ Unloading	Horizontal deflection @ Unloading	Average Vertical Deflection	Average Horizontal Deflection		
1	0	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00E+00	0.00E+00
2	300	0.3	2.940	0.410	0.100	0.480	0.400	0.445	0.250	3.36E-19	6.13E-20
3	600	0.6	5.880	0.910	0.300	0.950	0.900	0.930	0.600	6.72E-19	1.36E-19
4	900	0.9	8.820	1.400	0.990	1.400	0.990	1.400	0.990	1.01E-18	2.09E-19