MODULO DE YOUNG

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ARQUITECTURA

RESISTENCIA DE MATERIALES

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Cuatrimestre 4°

EJERCICIO

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- Se sostiene verticalmente una cinta de goma de 3x1.5mm de sección transversal, observa la tabla de cargas y longitudes, con ello determina el Módulo de Young.

Carga (g)	0	100	200	300	400
Longitud (cm)	8	8.6	9.2	9.8	10.4

CARGA	FUERZA	$\$ = F/A$	$\varepsilon = \frac{\Delta L}{L_0}$	$Y = \$/\varepsilon$
100g = 0.1kg	$0.1 \times 9.8\ m/s^2$ = 0.981N	$0.981 \div 4.5 \times 10^{-6}$ = 0.000000218	0.075	2.906×10^{-6}
200g = 0.2kg	$0.2 \times 9.81\ m/s^2$ = 1.962N	$1.962 \div 4.5 \times 10^{-6}$ = 0.000000436	0.15	2.906×10^{-6}
300g = 0.3kg	$0.3 \times 9.81\ m/s^2$ = 2.943N	$2.943 \div 4.5 \times 10^{-6}$ = 0.000000654	0.225	2.906×10^{-6}
400g = 0.4kg	$0.4 \times 9.8\ m/s^2$ = 3.924N	$3.924 \div 4.5 \times 10^{-6}$ = 0.000000872	0.3	2.906×10^{-6}

- A sección transversal = $3 \times 1.5\ mm = 4.5 \times 10^{-6}\ mm$
- $F = m \cdot g$

$F = 0.1\ (9.81\ m/s^2) = 0.981N$

$F = 0.2\ (9.81\ m/s^2) = 1.962N$

$F = 0.3\ (9.81\ m/s^2) = 2.943N$

$F = 0.1\ (9.8\ m/s^2) = 3.924N$

- $\Delta L = L_F - L_{inicial}$

$\Delta L = 8.6 - 8 = 0.6$

$\Delta L = 9.2 - 8 = 1.2$

$\Delta L = 9.8 - 8 = 1.8$

$\Delta L = 10.4 - 8 = 2.4$

$\varepsilon = \Delta L / L_0 =$

- $0.6/8 = 0.075$
- $1.2/8 = 0.15$
- $1.8/8 = 2.25$
- $2.4/8 = 0.3$