

Objective

To determine central deflection of a simply supported beam loaded at mid span.

Apparatus

Fixed beam apparatus, hanger, weight, meter rod, vernier caliper, dial gauge.

Theory**Simply Supported Beam**

A beam that is supported at both ends. It allows rotation at either end(support) but doesn't allow for vertical movement. As a result of this vertical reactions are produced at the supports as movement or displacement is not allowed in the vertical direction. But the supports are free from rotational moments (reactions).

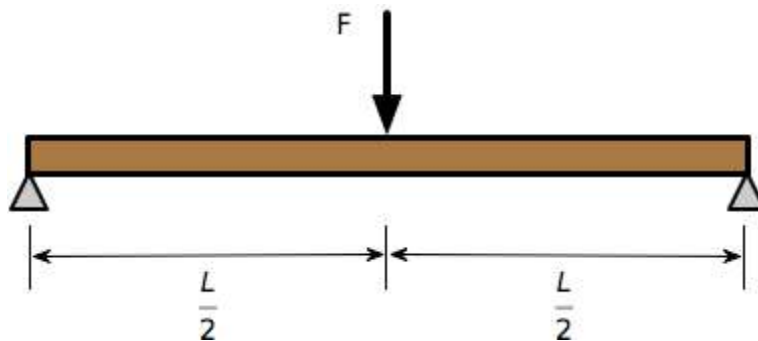


Figure 20 Simply Supported Beam

Procedure

- Set deflection of the beam apparatus\set dial indicator at zero\
- Apply a load and measure deflection using dial indicator
- Take a set of readings while loading and unloading the hanger and find the average value of experimental deflection
- Measure the length ,width and height of the beam using meter rod and vernier caliper & calculate the theoretical value of deflection using the given formula
- Compare the experimental & theoretical values of deflection

Observations and calculations

Effective length of beam= L =.....in

Width of beam= w =.....in

Height of beam= h =.....in

Area Moment of inertia = $I = \frac{wh^3}{12} = \dots \text{in}^4$

Modulus of Elasticity=Epsi

Sr.No	Experimental Deflection			Theoretical Deflection(in) δ_{CT} $= \frac{WL^3}{48EI}$
	δ_{ce}			
	Loading	Unloading	Average	
1				
2				
3				
4				

Procedure (Students' own words)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Difficulties / Suggestions

Concluding Remarks / Comments

Questions

- 1. Why there is a difference between experimental and theoretical values?**

- 2. What types of error can occur during experiment?**

- 3. How to improve experimental procedure?**
