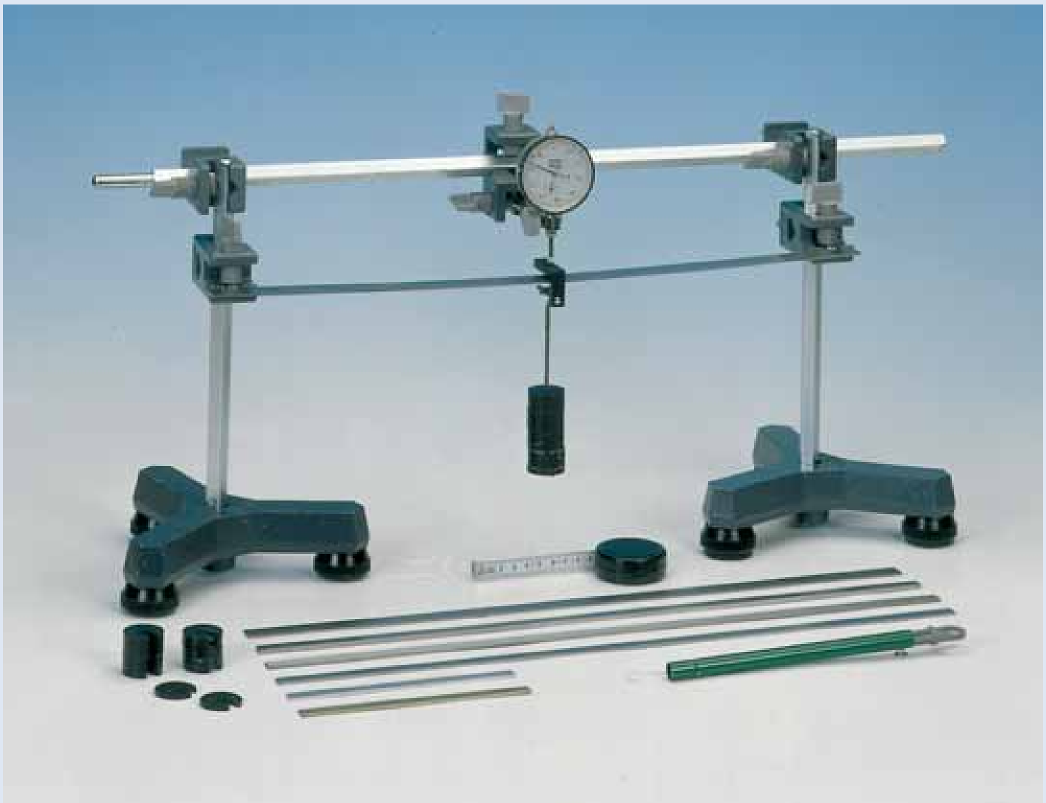
Modulus of elasticity 1.2.02-00



What you can learn about ...

- → Young's modulus
- → Modulus of elasticity
- → Stress
- → Deformation
- → Poisson's ratio
- → Hooke's law

Principle:

A flat bar is supported at two points. It is bent by the action of a force acting at its centre. The modulus of elasticity is determined from the bending and the geometric data of the bar.

What you need:

Dial gauge, 10/0.01 mm	03013.00	1
Holder for dial gauge	03013.01	1
Flat rods, set	17570.00	1
Knife-edge with stirrup	03015.00	1
Bolt with knife edge	02049.00	2
Weight holder for slotted weights	02204.00	1
Precision spring balance 1 N	03060.01	1
Tripod base -PASS-	02002.55	2
Support rod -PASS-, square, l = 250 mm	02025.55	2
Support rod -PASS-, square, l = 630 mm	02027.55	1
Right angle clamp -PASS-	02040.55	5
Slotted weights, 10 g, coated black	02205.01	10
Slotted weight, 50 g, coated black	02206.01	6
Measuring tape, l = 2 m	09936.00	1

Complete Equipment Set, Manual on CD-ROM included
Modulus of elasticity P2120200

Material	Dimensions [mm]	E $[N \cdot m^{-2}]$
Steel	10 × 1.5	$2.059 \cdot 10^{11}$
Steel	10 × 2	$2.063 \cdot 10^{11}$
Steel	10 × 3	$2.171 \cdot 10^{11}$
Steel	15 × 1.5	$2.204 \cdot 10^{11}$
Steel	20 × 1.5	$2.111 \cdot 10^{11}$
Aluminium	10 × 2	$6.702 \cdot 10^{10}$
Brass	10 × 2	$9.222 \cdot 10^{10}$

Table 1: The modulus of elasticity for different materials.

Tasks:

1. Determination of the characteristic curve of the dial gauge
2. Determination the bending of flat bars as a function
   - of the force
   - of the thickness, at constant force
   - of the width, at constant force
   - of the distance between the support points at constant force
3. Determination the modulus of elasticity of steel, aluminium and brass.