

# Thermal expansion of solids

## Thermal expansion of solids in length:

$$l = l_1 (1 + \alpha \Delta t)$$

Where:

$l$  – original length (m)

$l_1$  – increase in length (m)

$\alpha$  – linear expansivity ( $K^{-1}$ )

$\Delta t$  – temperature rise (K /  $^{\circ}C$ )

USE: the bimetal thermostat, the bimetal thermometer

- A lead wire with linear expansivity of  $\alpha = 2.9 \times 10^{-5} K^{-1}$  increases its temperature from  $-5^{\circ}C$  to  $45^{\circ}C$ . What is its increase in length?

## Expansion of volume of solids

Thermal expansion of volume:

$$V = V_1 (1 + \beta \Delta t)$$

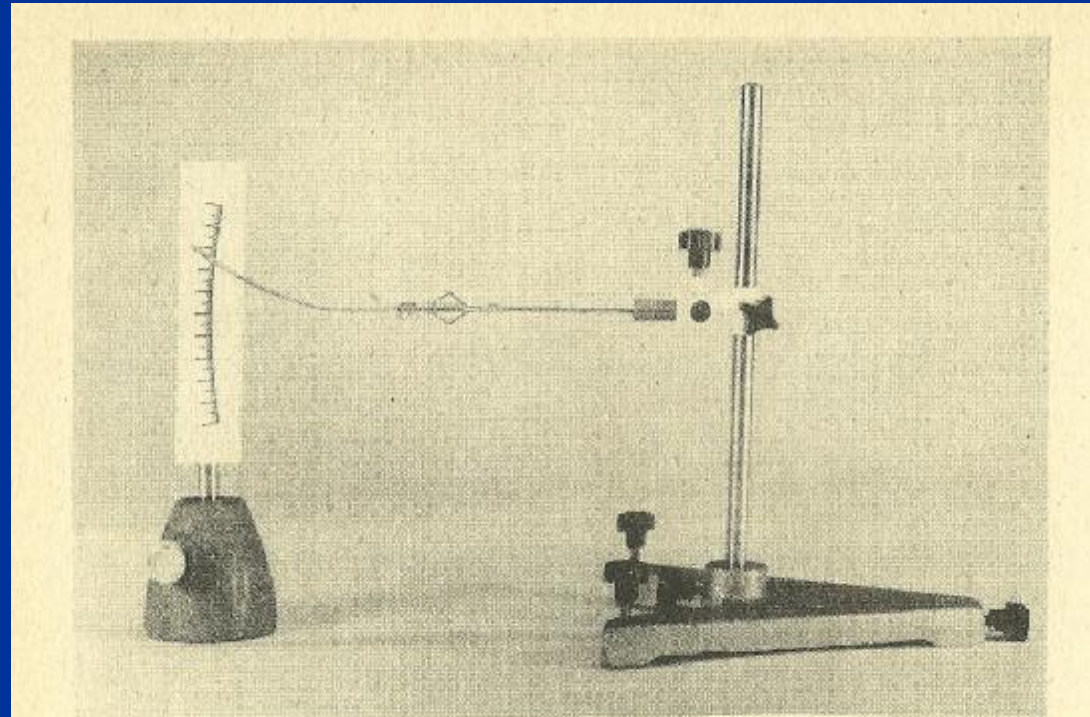
Where:

$V$  – original length (m)

$V_1$  – increase in length (m)

$\beta$  – expansivity of volume ( $K^{-1}$ )

$\Delta t$  – temperature rise ( $K / ^\circ C$ )



Obr. 5-26c

Bimetalický teplomer — usporiadanie na demonštráciu