

if $\Delta T = 1^\circ\text{C}$ or 1K $\Rightarrow$ by Eq (2) $\alpha = \frac{\Delta L}{L_0} \rightarrow$ Fractional change in length

Def of α : "Coefficient of Linear Expansion of a substance is the fractional change in the length when the temp. is increased by 1°C or 1K ".

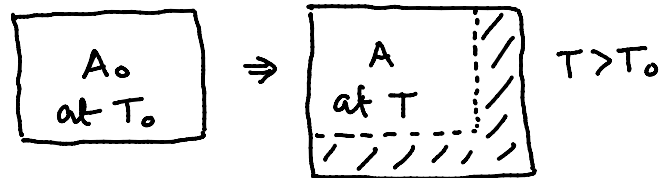
SI unit $\alpha = \text{K}^{-1}$

by (1) $L - L_0 = \alpha L_0 \Delta T \Rightarrow L = L_0 + \alpha L_0 \Delta T$

$L = L_0 (1 + \alpha \cdot \Delta T)$ — (2)

where $\Delta T = T - T_0$

2. Surface Expansion:



$\Delta A \propto A_0 \cdot \Delta T$

$\Rightarrow \Delta A = \beta A_0 \cdot \Delta T$ — (3)

$\beta = \alpha_A$

$\rightarrow$ Coefficient of superficial expansion