



THERMAL STRAIN

ONE WAY TO CAUSE DEFORMATION IS APPLYING STRESS.
ANOTHER WAY IS TO CHANGE TEMPERATURE.

$$\epsilon_T = \alpha \Delta T = \frac{\delta_T}{L}$$

COEFFICIENT of
THERMAL EXPANSION

→ USUALLY SAME IN
ALL 3 DIRECTIONS
UNITS? /°C

THERMAL STRAIN

IF APPLY STRESS AND CHANGE T,
1ST

$$\begin{aligned} \epsilon_{\text{TOTAL}} &= \epsilon_{\text{(MECH)}} + \epsilon_T \\ &= \frac{\sigma}{E} + \alpha \Delta T \end{aligned}$$

DOES $\sigma = E \epsilon_T$? MAYBE!!

MORE TO COME!