Let: $\boldsymbol{l = 10m = 1000\ cm}$

$\boldsymbol{\Delta l = 0.5\ cm}$

$\boldsymbol{t1 = 2.5℃}$

$\boldsymbol{\alpha(iron) = 1.13 \times 10^{-5} K^{-1}}$

$\boldsymbol{\Delta l = l \times \alpha(t2 - t1)}$

$\boldsymbol{t2 = t1 + \frac{\Delta l}{l \times \alpha}}$

Enter the data:

$$\boldsymbol{t2 = 2.5 + \frac{0.5}{1000 \times 1.13 \times 10^{-5}} = 46.75℃}$$

Answer:

The temperature at which the gap will close is: $46.75℃$