

Calculating the U-Value for an element with two layers and resistance of surface internal and external.

Resistance of surface

$$R_{se} = 0.04 \frac{m^2 K}{W} \quad (1)$$

$$R_{si} = 0.13 \frac{m^2 K}{W} \quad (2)$$

Parameters for elements

$$d_1 = 0.20 \text{ m} \quad (3)$$

$$\lambda_1 = 0.04 \frac{W}{m K} \quad (4)$$

$$d_2 = 0.10 \text{ m} \quad (5)$$

$$\lambda_2 = 0.50 \frac{W}{m K} \quad (6)$$

Calculate thermal resistance

$$R = R_{se} + \frac{d_1}{\lambda_1} + \frac{d_2}{\lambda_2} + R_{si} = 0.04 + \frac{0.20}{0.04} + \frac{0.10}{0.50} + 0.13 = 6.08 \frac{m^2 K}{W} \quad (7)$$

Calculate U-Value

$$U = \frac{1.00}{R} = \frac{1.00}{6.08} = 0.16 \frac{W}{m^2 K} \quad (8)$$