Weeklysubmission-3

21 October 2019 23:53

1.

$$R_i = \frac{1}{h_i \times A} = \frac{1}{10 * 0.25} = 0.4\ °C/W$$

$$R_f = \frac{L_f}{k_f \times A} = \frac{0.03}{0.026 * 0.25} = 4.62\ °C/W$$

$$R_{p_{c_1}} = R_{p_{c_2}} = \frac{L_{p_{c_1}}}{k_p \times A_{p_{c_1}}} = \frac{0.32}{0.22 * 0.015} = 96.97\ °C/W$$

$$R_b = \frac{L_b}{k_b \times A_b} = \frac{0.32}{0.72 * 0.22} = 2.02\ °C/W$$

$$\frac{1}{R_{tot_{parallel}}} = \frac{1}{R_b} + \frac{1}{R_{p_{c_1}}} + \frac{1}{R_{p_{c_2}}} = \frac{1}{2.02} + 2 * \left(\frac{1}{96.97}\right) = 0.52\ °C/W$$

$$\rightarrow \frac{1}{R_{tot_{parallel}}} = 0.52\ W/°C \longrightarrow R_{tot_{parallel}} = \frac{1}{0.52} = 1.92°C/W$$

$$R_{P_1} = R_{P_2} = \frac{L_{p_1}}{k_p \times A_{p_1}} = \frac{0.02}{(0.22 * 0.25)} = 0.36\ °C/W$$

$$R_{\downarrow o} = \frac{1}{h_0 \times A} = \frac{1}{40 * 0.25} = 0.1\ °C/W$$

$$R_{total} = R_i + R_o + 2 * R_{P_1} + R_{tot_{parallel}} + R_{foam}$$

*=0.4+0.1+2*0.36+1.92+4.62*

$$=7.76\ °C/W$$

$$R_{total} = 7.76\ °C/W$$

Comparing the result of the practice we did in the class, with the thickness of 16 cm of the brick, and the result of 32 cm of the brick, we can find out that, if the bricks get

thicker, the R-value will decrease, which means higher resistance.

2.

	Wood	Insulation
Outside Air	0.03	0.03
Wood bevel l.	0.14	0.14
Plywood(13mm)	0.11	0.11
Urethane rigid foam.	No	0.98*90/25=3.528
Wood studs	0.63	No
Gypsum board	0.079	0.079
Inside surface	0.12	0.12

$$R'_{withWood} = 0.03 + 0.14 + 0.11 + 0.63 + 0.079 + 0.12 = 1.109\ m^2.°C/W$$

$$R'_{withIns} = 0.03 + 0.14 + 0.11 + 3.528 + 0.079 + 0.12 = 4.009\ m^2.°C/W$$