

1.convection happens when materials are passing beside each other and it is the way that fluids like gas transfer most of their energy.

for calculating the Q we need to calculate the R for coventions before and glasses (2 layers) and air gap and when we add it all up it will be R total.from there we can calculate Q and when we have Q we can calculate any tempreture anywhere in the layers.

As the heat transfer through the window plane is a lot the thickness of the plane becomes irrelevant.

2. I was absent

3.

$$R_{g_1} = R_{g_2} = \frac{L_g}{(K_g \times A)} = \frac{0.006}{0.78 * 0.8 * 1.5} = 0.0064 \text{ } ^\circ \frac{C}{W}$$

$$R_{airGap} = \frac{L_{airGap}}{(K_{airGap} \times A)} = \frac{0.013}{0.026 * 1.2} = 0.4166 \text{ } ^\circ C/W$$

$$R_{conv_1} = \frac{1}{h_1 \times A} = \frac{1}{10 * 1.2) } = 0.0833 \text{ } ^\circ C/W$$

$$R_{conv_2} = \frac{1}{h_2 \times A} = (\frac{1}{40 * 1.2) } = 0.0208 \text{ } ^\circ \frac{C}{W}$$

$$R_{tot} = 0.0833 + 0.0208 + 2 * 0.0064 + 0.4166 = 0.5335 \text{ } ^\circ \frac{C}{W}$$

$$\dot{Q} = \frac{\Delta T}{R_{Tot}} = \frac{30}{0.5335} = 56.2324 \text{ } W$$

If the width between the layers be more than a certain amount we will have air convention and the window will lose its R.