

1. Convection heat transfer is energy transport due to bulk fluid motion. Convection heat transfer through gases and liquids from a solid boundary results from the fluid motion along the surface.

Since heat transfer through the window is massive, the thickness becomes irrelevant.

2. My mistake in one of the questions was about just the calculation process.

3.

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

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

$$R_{conv_1} = \frac{1}{h_1 \times A} = \frac{1}{10 * 1.2} = 0.0833 \frac{C}{W}$$

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

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

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

Actually if we increase the distance between two glasses more than a specific distance the heat convection starts.