submission week 1

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1 Write a short summary about the conductive heat transfer.

Conduction as heat transfer takes place if there is a temperature gradient in a solid or stationary fluid medium. With conduction energy transfers from more energetic to less energetic molecules. Heat flows in direction of decreasing temperatures since higher temperatures are associated with higher molecular energy.

Fourier's Law say that:

$$\dot{Q} = -kA\frac{dT}{dx} \qquad (W)$$

$\dot{Q}$ = conductivity

k = constant of the material

A = area

dT = variation of temperature

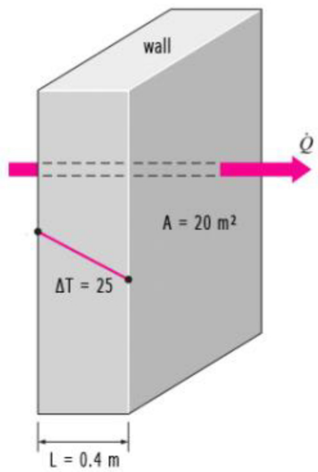
dx = change of space

The Fourier's Law can be applied to calculate the heat conduction throught the walls.

$$\dot{Q}_{cond,\,wall} = kA\frac{T_1 - T_2}{L} \qquad (W)$$

It is proportional to the average thermal conductivity, the wall area, and the temperature difference.
It is inversely proportional to the wall thickness.
Once the rate of heat conduction is available, the temperature T(x) at any location x can be determined.
Under steady conditions, the temperature distribution in a plane wall is a straightline:dT/dx=constant.

2 Find the rate of heat trasfer throught the wall if k=0,78 W/m C (using both simple metodo and using the resistance concept).



$$\dot{Q} = kA\frac{\Delta T}{L} = 0.78 * 20 * \frac{25}{0.4} = 975\ W$$

$$R_{wall} = \frac{L}{kA} = \frac{0.4}{0.78 * 20} = 0.0256\ K/W$$

$$\dot{Q} = \frac{\Delta T}{R_{Wall}} = \frac{25}{0.0256} = 976.56\ W$$