WEEK 1

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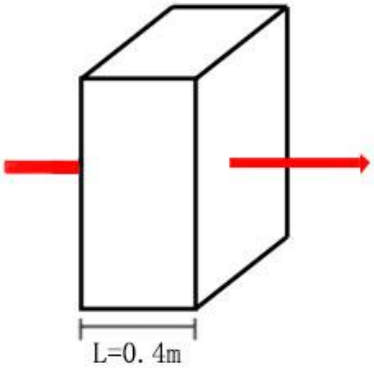
A short summary about the conductive heat transfer and solving the same exercise with L= 0.4 m, A= 20 m2, DeltaT= 25, and k=0.78 W/m K using both simple method and using the resistance concept



（1） Simple method

$$\dot{Q}=\frac{kA\Delta T}{L}$$

$$\dot{Q}=0.78*20*\frac{25}{0.4}$$

$$\dot{Q}=975W$$

(2) Resistance concept

$$R_{WALL}=\frac{L}{kA}=\frac{0.4}{0.78*20}\approx 0.02564K/W$$

$$\dot{Q}=\frac{\Delta T}{R_{WALL}}=\frac{25}{0.02564}\approx 975.04W$$

Summary： In steady operation.the rate of heat transfer through the wall is constant. The rate of heating conduction through a plane wall is proportional to the average thermal conductivity,the wall area , and the temperature difference.And it is depend on the wall thickness.And once the rate of heat conduction is available,The temperature and length in the formula can be replaced in practice.

Because of different temperature,The rate of energy transfer from the more energetic particles of a substance to the adjacent less energetic .