Week6-Maryam-sargolzaee

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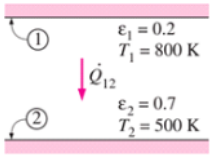
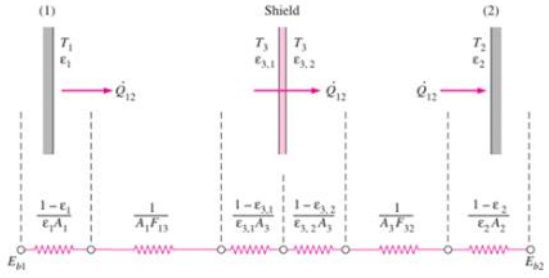
Task 1

Considering the same example you solved in the previous assignment (radiative heat transfer between two parallel plates), how many shields with epsilon = 0.1 should you add in order to have the new heat transfer rate to be 1% of the case without shields?





$$\boldsymbol{Without\ shield, \varepsilon_1 = 0.2\ and\ \varepsilon_2 = 0.7,}$$

$$\dot{Q}_{12} = \frac{E_{b1} - E_{b2}}{\frac{1-\varepsilon_1}{A\varepsilon_1} + \frac{1}{AF_{12}} + \frac{1-\varepsilon_2}{A\varepsilon_2}} = \frac{A\sigma(T_1^4 - T_2^4)}{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1}$$

$$\boldsymbol{With\ N\ shield\ \varepsilon_3 = 0.1}$$

$$\dot{Q}_{12Nshields} = \frac{E_{b1} - E_{b2}}{\frac{1-\varepsilon_1}{A\varepsilon_1} + \frac{1}{AF_{13}} + \frac{1-\varepsilon_3}{A\varepsilon_3} + N \times \left(\frac{1-\varepsilon_3}{A\varepsilon_3} + \frac{1}{AF_{33}} + \frac{1-\varepsilon_3}{A\varepsilon_3}\right) + \frac{1-\varepsilon_3}{A\varepsilon_3} + \frac{1}{AF_{32}} + \frac{1-\varepsilon_2}{A\varepsilon_2}}$$

$$= \frac{A\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_3} - 1\right) + N\left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1\right) + \left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_2} - 1\right)} = \frac{A\sigma(T_1^4 - T_2^4)}{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right) + (N+1)\left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1\right)}$$

$$\frac{\dot{Q}_{12Nshields}}{\dot{Q}_{12}} = \frac{\left(\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1\right) + (N+1)\left(\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1\right)}{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1} = \mathbf{1} + (\boldsymbol{N+1})\frac{\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1}{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1} = 100$$

$$\Leftrightarrow \boldsymbol{N} = 99 \times \frac{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1}{\frac{1}{\varepsilon_3} + \frac{1}{\varepsilon_3} - 1} - 1 = 99 \times \frac{\frac{1}{0.2} + \frac{1}{0.7} - 1}{\frac{1}{0.1} + \frac{1}{0.1} - 1} - 1 \approx 27.3$$

Conclusion: 27 shields can be added.

Task 2

The first stage in making the building is to set the top view, then draw it.
next step is offset and then make it three level .
In next step adding shader.
Then adding information with open studio and then adding weather data
And proccesing and end to result.