Task 1: In you own words (which means in your own words) write a summary of the topics about radiative heat transfer we went through including the definitions of emissivity, absorptivity and reflectivity, the view factor, the heat exchange between two black surfaces, the heat exchange between the two grey surface and finally the definition of radiative resistances.

Radiative Heat Transfer

Emissivity can be understood as the ratio of the radiation flux emitted per unit area on the surface of an object to the radiation flux emitted by the black body at the same temperature.From this it can be understood that the actual thermal radiation of the object is close to that of the black body and it is also an important basic factors that affects the surface temperature.
Factors that influence emissivity are the dielectric constant, surface roughness, temperature, wavelength and observation direction, and its value is between 0 and 1.

Absorptivity is a measure of a substance's ability to absorb light at a given wavelength, expressed by the symbol epsilon.For a medium with selective absorption in the visible light region, it represents the sensitivity of a certain colour reaction. For the same measured element, the greater the sensitivity, the more sensitive the colour reaction will be. For the same colour reaction, the sensitivity is related to the measured concentration. The molar absorption coefficient usually refers to the molar absorption coefficient at the maximum absorption wavelength.
Factors that influence absorptivity are the size of the molar absorption coefficient which is related to the properties of the substance to be measured, the solvent and the wavelength of light.

Reflectivity is the amount of radiant energy reflected by an object as a percentage of the total radiant energy.
Factors that influence reflectivity are the nature of the object itself (surface condition), as well as the wavelength of incident electromagnetic wave and incident angle.

View Factor is a geometrical quantity corresponding to the fraction of the radiation leaving surface i that is intercepted by the surface j.
It does not depend on the surface properties.
It is also called shape factor, configuration factor, and angle factor.

Heat Exchange between two Black Surfaces : Heat exchange between 2 black surfaces occurs when the heat emitted by one black surface is completely absorbed by the other black surface, while at the same time the other surface also emits heat which is absorbed by the first black surface.

Heat Exchange between the two Grey Surface : Here the grey surfaces are able to absorb and emit only a fraction of the entire radiation emitted by the other body. They are not as effective as the black surfaces.

Radiative Resistances is a value used to measure the loss resistance energy, and the loss energy is converted into heat radiation; the energy lost by the radiative resistance is converted into radio waves.

Task2: Solve the last example you solved in the class (radiative heat exchange between two parallel plates) awhile considering the two emissivities to be 0.1, what can you conclude from the result?

$$\dot{Q}_{1\to2} = \frac{A_1\sigma\left(T_1^4 - T_2^4\right)}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} = \frac{1.5*5.67*10^{-8}*\left(308^4 - 298^4\right)}{\frac{1}{0.1} + \frac{1}{0.1} - 1} = 4.9821\text{W}$$

$$F_{12} = \frac{1}{\frac{1}{\epsilon_1} + \frac{1}{\epsilon_2} - 1} = \frac{1}{\frac{1}{0.1} + \frac{1}{0.1} - 1} = 0.0526$$

$F_{12} = 0.01$

$\dot{Q}_{1\to2} = A_1 \times F_{12} \times \sigma\left(T_1^4 - T_2^4\right) =$ 1.5*0.01*5.67*10-8*(2984-3084) =-0.9466 W

$\dot{Q}_{2\to1} = -\dot{Q}_{1\to2} =$ 0.9466 W

Conclusion

Since the value of emissivity increases the view factor increases exponentially, which results in the increase of the value of radiative heat transfer.