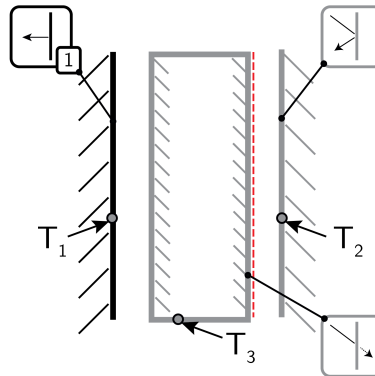


Surface Brightness 11

Determine the surface brightness $\dot{Q}_{3,\text{right}}$. Use surface brightnesses whenever possible.



Definition of the surface brightness:

$$\dot{Q}_{3,\text{right}} = \dot{Q}_{3,\text{right},\epsilon} + \cancel{\dot{Q}_{3,\text{right},\rho}} + \dot{Q}_{3,\text{right},\tau}^0$$

Defining the emitted, reflected and transmitted radiation:

The emitted radiation of a black body radiator can be stated as:

$$\dot{Q}_{3,\text{right},\epsilon} = \epsilon_3 \sigma A_3 T_3^4$$

The transmitted radiation can be expressed by the transmission coefficient and the radiation being transferred toward the back of the body:

$$\dot{Q}_{3,\text{right},\tau} = \tau_3 \cancel{\Phi_{13}} \dot{Q}_1^1$$

Inserting and rewriting:

$$\Rightarrow \dot{Q}_{3,\text{right}} = \epsilon_3 \sigma A_3 T_3^4 + \tau_3 \dot{Q}_1$$

,