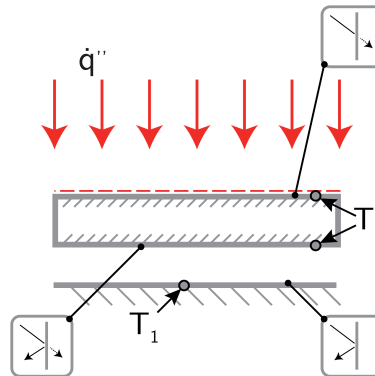


Surface Brightness 29

Determine the surface brightness $\dot{Q}_{2,\text{top}}$. Use surface brightnesses whenever possible.



Definition of the surface brightness:

$$\dot{Q}_{2,\text{top}} = \dot{Q}_{2,\text{top},\epsilon} + \dot{Q}_{2,\text{top},\rho} + \dot{Q}_{2,\text{top},\tau}$$

Defining the emitted, reflected and transmitted radiation:

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

$$\dot{Q}_{2,\text{top},\epsilon} = \epsilon_{2t} \sigma A_2 T_2^4$$

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

$$\dot{Q}_{2,\text{top},\tau} = \tau_{2b} \Phi_{12} \dot{Q}_1$$

Inserting and rewriting:

$$\Rightarrow \dot{Q}_{2,\text{top}} = \epsilon_{2t} \sigma A_2 T_2^4 + \tau_{2b} \dot{Q}_1$$