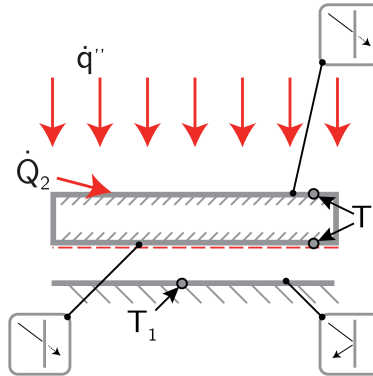


# Surface Brightness 33

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



Definition of the surface brightness:

$$\dot{Q}_{2,\text{bottom}} = \dot{Q}_{2,\text{bottom},\epsilon} + \overset{0}{\dot{Q}_{2,\text{bottom},\rho}} + \dot{Q}_{2,\text{bottom},\tau}$$

Defining the emitted, reflected and transmitted radiation:

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

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

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

$$\dot{Q}_{2,\text{bottom},\tau} = \tau_{2t} (\dot{Q} + \dot{Q}_2) = \tau_{2t} (\dot{q}'' A_2 + \dot{Q}_2)$$

Inserting and rewriting:

$$\Rightarrow \dot{Q}_{2,\text{bottom}} = \epsilon_{2b} \sigma A_2 T_2^4 + \tau_{2t} (\dot{q}'' A_2 + \dot{Q}_2)$$

,