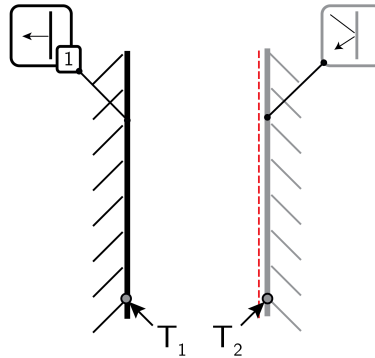


Surface Brightness 07

Determine the surface brightness \dot{Q}_2 .



Definition of the surface brightness:

$$\dot{Q}_2 = \dot{Q}_{2,\epsilon} + \dot{Q}_{2,\rho} + \dot{Q}_{2,\tau}^0$$

Defining the emitted, reflected and transmitted radiation:

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

$$\dot{Q}_{2,\epsilon} = \epsilon_2 \sigma A_2 T_2^4$$

The reflected radiation can be expressed by the reflection coefficient and the radiation being transferred toward the body:

$$\dot{Q}_{2,\rho} = \rho_2 \Phi_{12} \dot{Q}_1^1 = \rho_2 \sigma A_1 T_1^4$$

Inserting and rewriting:

$$\Rightarrow \dot{Q}_2 = \sigma (\epsilon_2 A_2 T_2^4 + \rho_2 A_1 T_1^4)$$