$T_{cool} = 580\ K$ $\quad LHR = 200\ \frac{W}{cm}$ $\quad h_{cool} = 2.65\ \frac{W}{cm^2 \cdot K}$

$R_f = 0.5\ cm$ $\quad t_c = 0.06\ cm$ $\quad t_g = 0.003\ cm$

$K_f = 0.03\ \frac{W}{cm \cdot K}$ $\quad K_c = 0.17\ \frac{W}{cm\,K}$

$T_o = ?$

- outside → in

$$T_{co} - T_{cool} = \frac{LHR}{2\pi R_f}\frac{1}{h_{cool}} = \frac{200}{2\pi(0.5)}\frac{1}{2.65} = 24\ K$$

$$T_{co} = 24 + 580 = 604\ K$$

$$T_{c_1} - T_{co} = \frac{LHR}{2\pi R_f}\frac{t_c}{K_c} = \frac{200}{2\pi(0.5)}\frac{0.06}{0.17} = 22.5\ K$$

$$T_{c_1} = 604 + 22.5 = 626.5\ K$$

$$T_s - T_{c_1} = \frac{LHR}{2\pi R_f}\frac{1}{h_g} \qquad K_g(T) = 16 \times 10^{-6} T^{0.79}$$

$T \approx T_{c_1} = 626.5\ K$

$$= \frac{200}{2\pi(0.5)}\frac{0.003}{0.00026} = 73.8\ K \qquad K_g(T) = 0.00026\ \frac{W}{cm \cdot K}$$

$$T_s = 73.8 + 626.5 = 700.3\ K$$

$$T_o - T_s = \frac{LHR}{4\pi K_f} = \frac{200}{4\pi(0.03)} = 530.5\ K$$

$$T_o = 530.5 + 700.3 = 1230.8\ K$$