71. The problem asks for 0.5% of $E$, where $E = Pt$ with $t = 120$ s and $P$ given by Eq. 19-38. Therefore, with $A = 4\pi r^2 = 5.0 \times 10^{-3}$ m$^2$, we obtain

$$(0.005)Pt = (0.005)\sigma\varepsilon AT^4 t = 8.6 \text{ J} .$$