

58. (a) Since $\rho = RA/L = \pi R d^2 / 4L = \pi(1.09 \times 10^{-3} \Omega)(5.50 \times 10^{-3} \text{ m})^2 / [4(1.60 \text{ m})] = 1.62 \times 10^{-8} \Omega \cdot \text{m}$, the material is silver.

(b) The resistance of the round disk is

$$R = \rho \frac{L}{A} = \frac{4\rho L}{\pi d^2} = \frac{4(1.62 \times 10^{-8} \Omega \cdot \text{m})(1.00 \times 10^{-3} \text{ m})}{\pi(2.00 \times 10^{-2} \text{ m})^2} = 5.16 \times 10^{-8} \Omega .$$