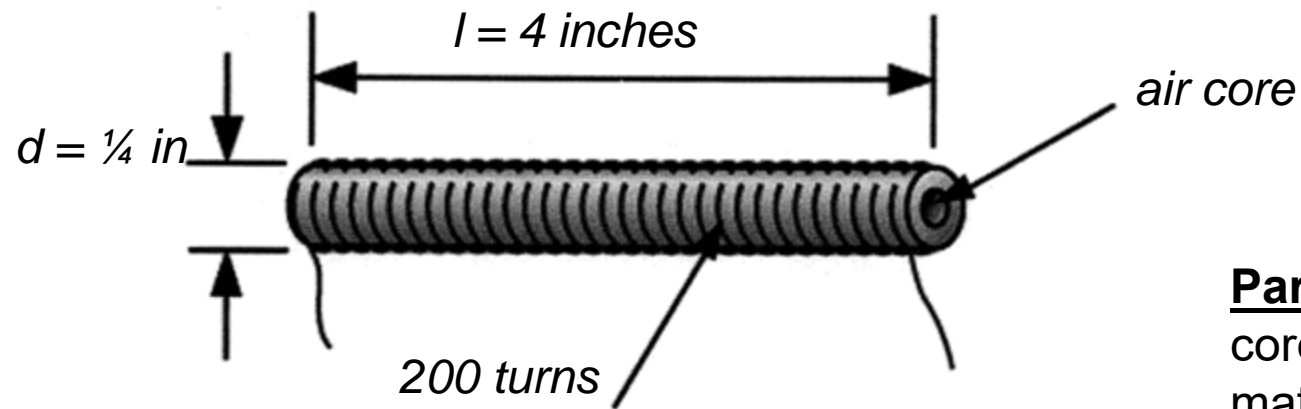


ICP

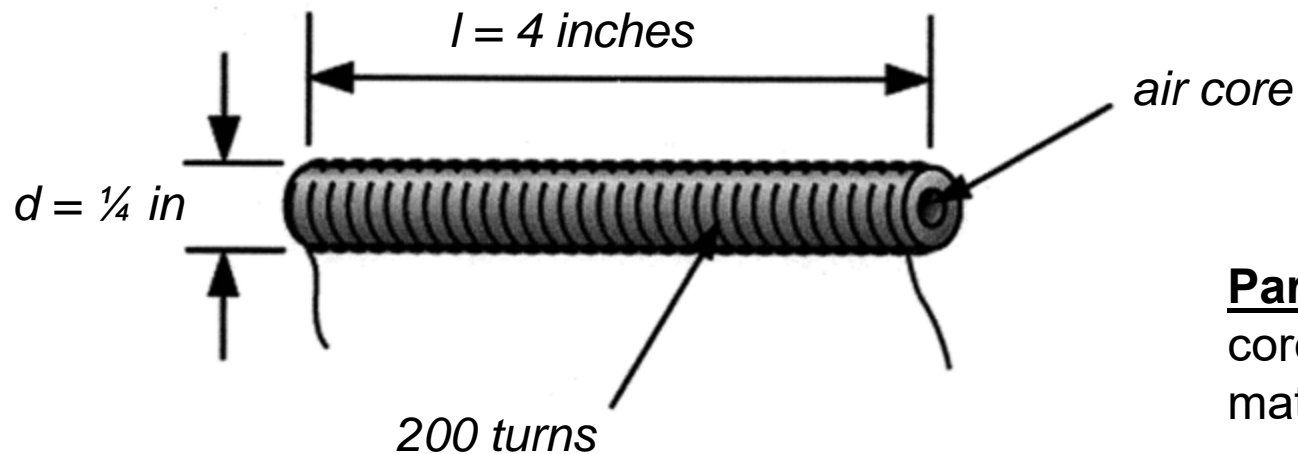
- Find L in Henries



Part II : Find L if the core was a magnetic material with $\mu_r = 125$

ICP

- Find L in Henries



Part II : Find L if the core was a magnetic material with $\mu_r = 125$

Convert to metric units, then use
$$L_0 = \frac{N^2 \mu_0 A}{l}$$

$$d = 0.25 \text{ in} = 0.25 * 0.0254 \frac{\text{m}}{\text{in}} = 6.35 \cdot 10^{-3} \text{ m}$$

$$l = 4 \text{ in} = 4 * 0.0254 \frac{\text{m}}{\text{in}} = 0.102 \text{ m}$$

ICP

$$A = \frac{\pi d^2}{4} = \frac{\pi (6.35 \cdot 10^{-3} m)^2}{4} = 31.67 \cdot 10^{-6} m^2$$

$$L_0 = \frac{N^2 \mu_0 A}{l} = \frac{200^2 \cdot \left(4\pi \cdot 10^{-7} \frac{Wb}{A \cdot m} \right) (31.67 \cdot 10^{-6} m^2)}{0.102 m}$$
$$= \boxed{15.6 \mu H}$$

ICP (pt. II)

$$L = \mu_r(L_0)$$

$$\mu_r = 125$$

$$L_0 = 15.6\mu H$$

$$L = 125 * 15.6\mu H = \boxed{1.95mH}$$