

$$\mu_0 := 12.566370614 \cdot 10^{-7} \frac{\text{N}}{\text{A}^2}$$

$$\mu_r := 1 + 0.4 \cdot 10^{-6}$$

$$N_{\text{Spule}} := 2$$

$$r_{\text{Spule}} := 0.5 \text{ mm}$$

$$A_{\text{Spule}} := \pi \cdot r_{\text{Spule}}^2 = 7.854 \times 10^{-7} \text{ m}^2$$

$$l_{\text{Spule}} := 2.5 \text{ mm}$$

$$L_{\text{Spule}} := N_{\text{Spule}}^2 \frac{(\mu_0 \cdot \mu_r \cdot A_{\text{Spule}})}{l_{\text{Spule}} + 2 \frac{r_{\text{Spule}}}{2.2}} = 1.336 \times 10^{-9} \text{ H}$$