sec PIES

$$L_L = 4\pi N_P^2 U_M (\Delta_G + \frac{\Sigma \delta_i}{3}) \frac{1}{L_M} [nH]$$

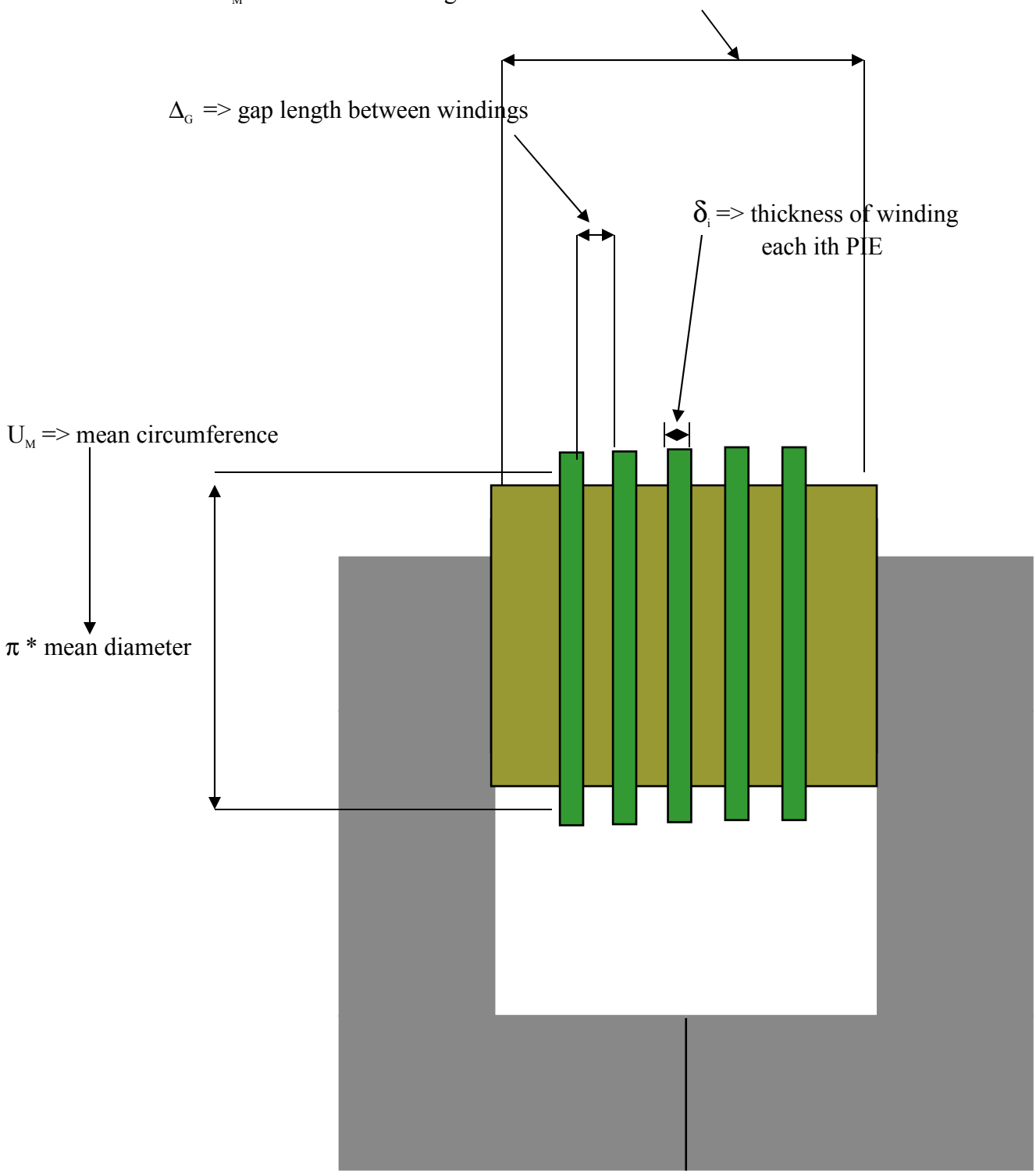
L_M ==> Maximum length of either \OR both PRI \ SEC

Δ_G => gap length between windings

δ_i => thickness of winding each ith PIE

U_M => mean circumference

π * mean diameter



EXAMPLES:

From REF: "Development and Applic of an Inverter Charging .. "

"where N_P is primary turns (24 turns), U_M is mean circumference of windings (20 cm), Δ_G is gap length between windings (1 cm), δi is thickness of windings (1 cm), and L_M is winding length (9 cm).

$$L_L = (6.28)(24)^2\,(20)\left[\,1 + (7*1)/3\right]\,[1/9]\,[nH]$$

= 6.28*576*20[1+7/3]*0.111 nH = 2.4E4 nH = 24uH << == the ref says 21uH

35:1 transformer ==> measured ~~ 3uH using FLUKE

/__ rough measurements: mean dia ~ 2.1" =5.3cm; have 4 PIES

`U_M ==>~ 16.75cm ; Δ_G = ~ 0.2" = 0.508cm; δ = ~0.355cm;L_M=~1.7"= 4.3cm

$$L_L = (6.28)(10)^2\,(16.75)\left[\,0.508 + (4*0.355)/3\right]\,[1/4.3]\,[nH]$$

= 6.28*576*20[1+7/3]*0.111 nH = 2.4E4 nH = 2uH << == measure ~3uH

270:1 transformer ==> measured ~~ 4.5uH using SENCORE

/__ rough measurements: mean dia ~ 2.6" =>π 2.6 = 8.2"; have 4 PIES

`U_M ==>~ 20.7cm ; Δ_G = ~ 0.25" = 0.635cm; δ = ~0.508cm;L_M=~1.7"= 4.3cm

$$L_L = (6.28)(10)^2\,(20.7)\left[\,0.635 + (4*0.508)/3\right]\,[1/4.3]\,[nH]$$

= 6.28*576*20[1+7/3]*0.111 nH = 2.4E4 nH = 5.4uH << == measure ~4.5uH