# Elektrische Aandrijvingen

**WTB**

**Lokatie / evenement**

**P.BAUER**

**February 22, 2013**



Delft University of Technology

# Transformer

- AC circuits
- Isolate circuits
- Voltage or current higher/lower

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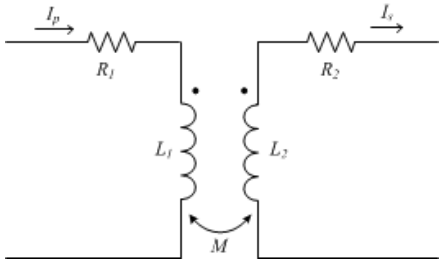
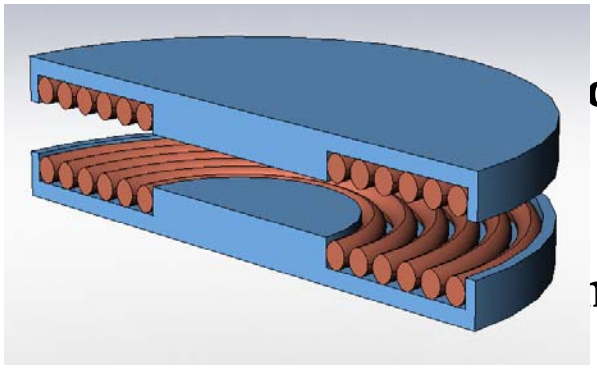
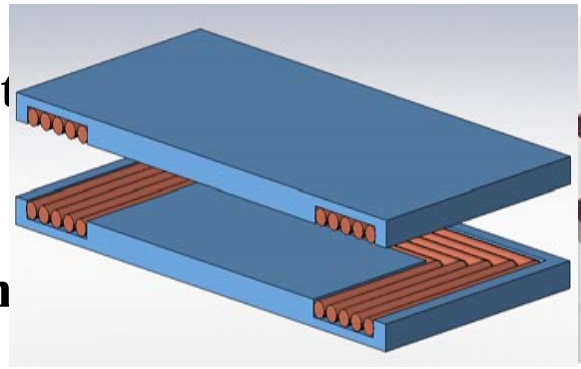
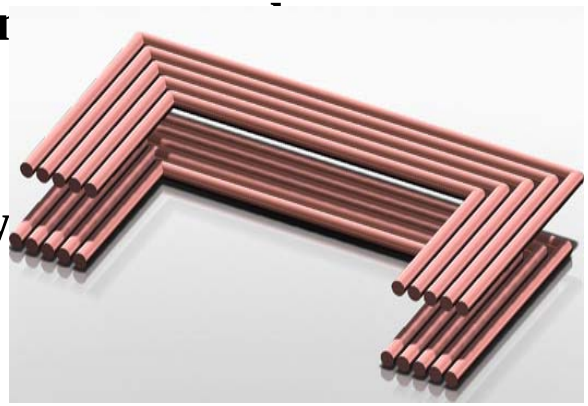
# Concept




- ct
- n
- in
- w



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# Voltage induced in coil

- $E = 4.44\ f\ N\ \Phi_{max}$

- $I_m = E/X_m$

- $E_g = 4{,}44\ f\ N\ \Phi$

FIGURE 9-1 **a. A voltage is induced in a coil when it links a variable flux . b. A sinusoidal flux induces a sinusoidal voltage.**

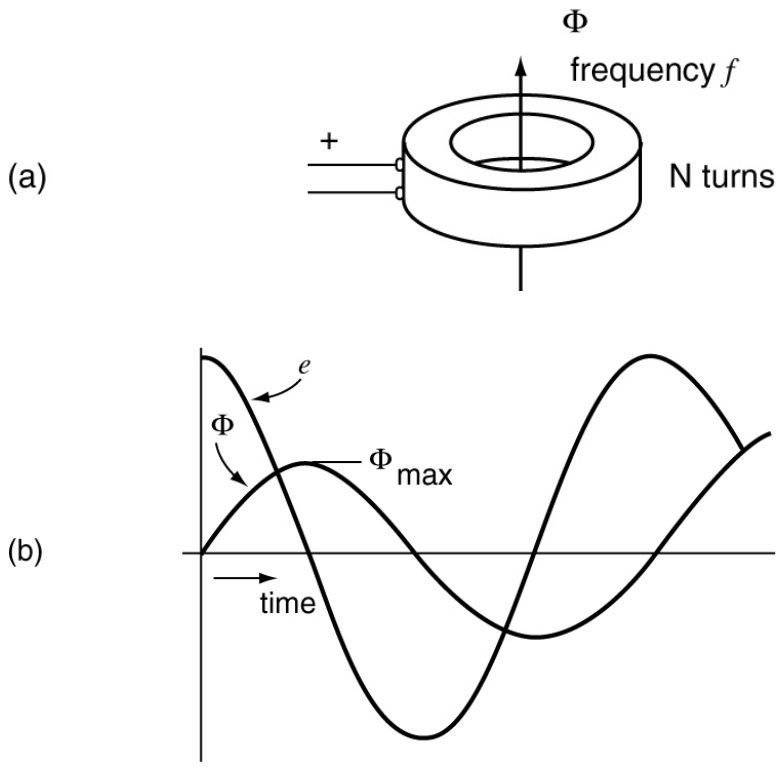


FIGURE 9-2 **a. The voltage *E* induced in a coil is equal to the applied voltage $E_g$. b. Phasor relationships among $E_g$, $E$, $I_m$, and Φ.**

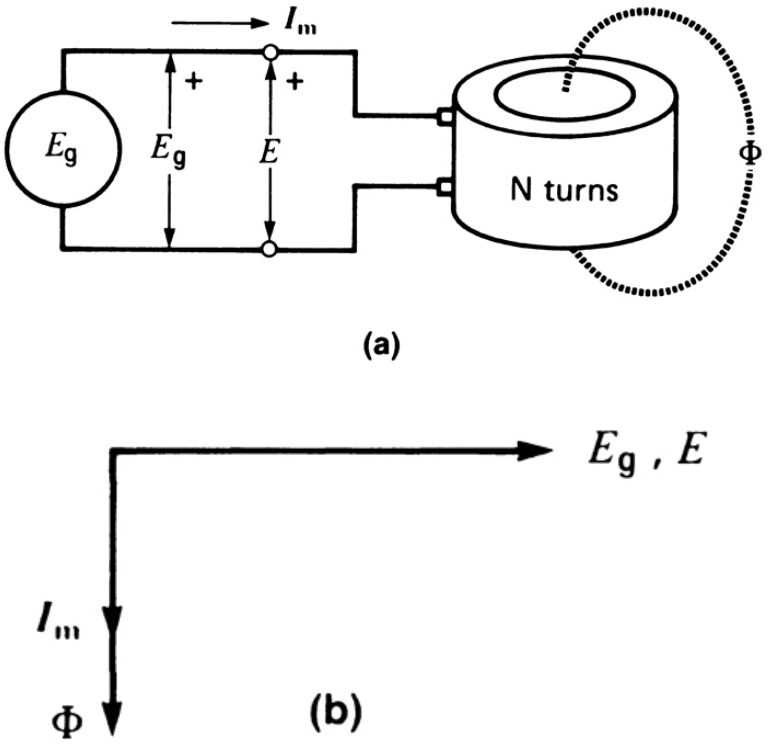




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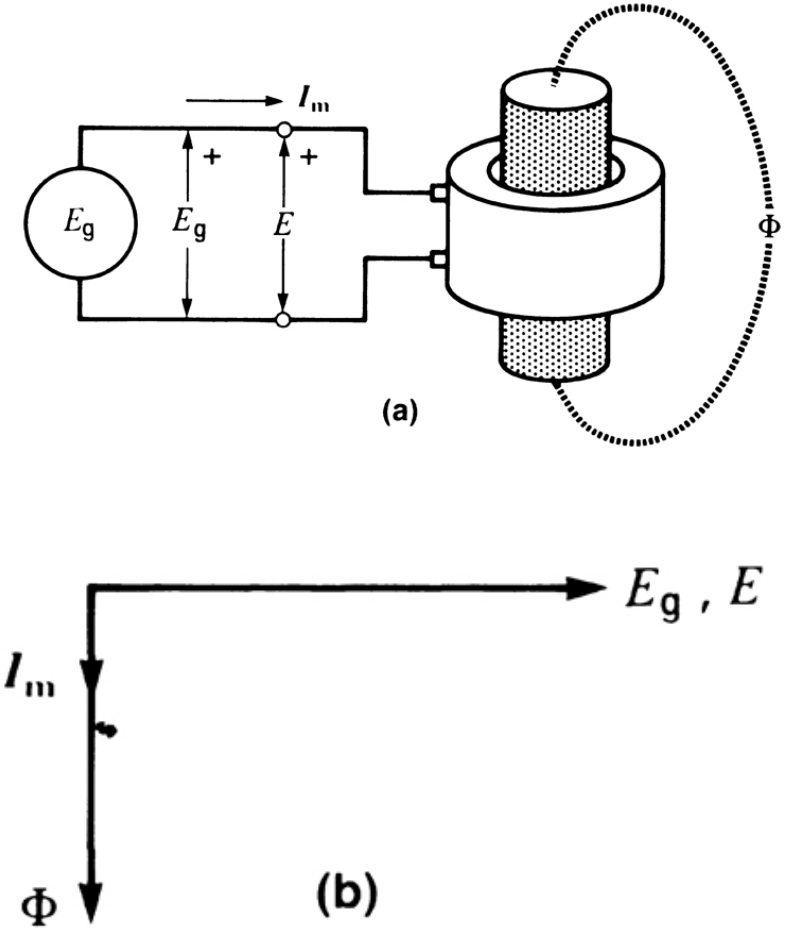
FIGURE 9-3 **a. The flux in the coil remains constant so long as $E_g$ is constant. b. Phasor relationships.**



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# Elementary transformer

FIGURE 9-4 **Voltage induced in a secondary winding. Mutual flux is $\Phi_{m1}$; leakage flux is $\Phi_{f1}$.**

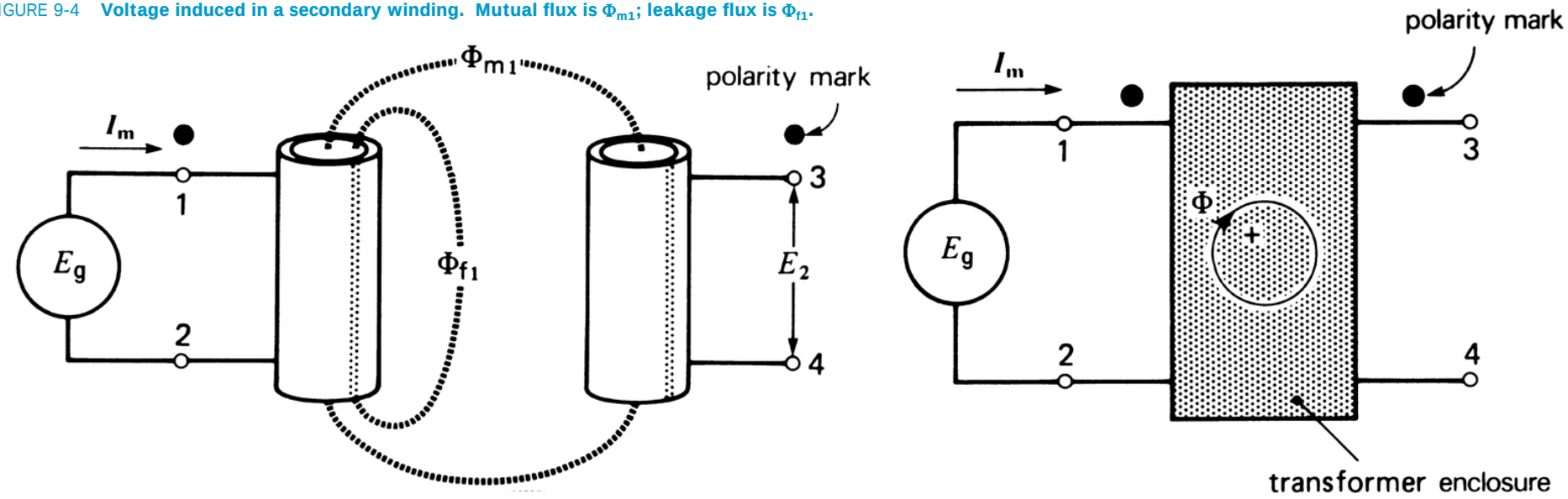




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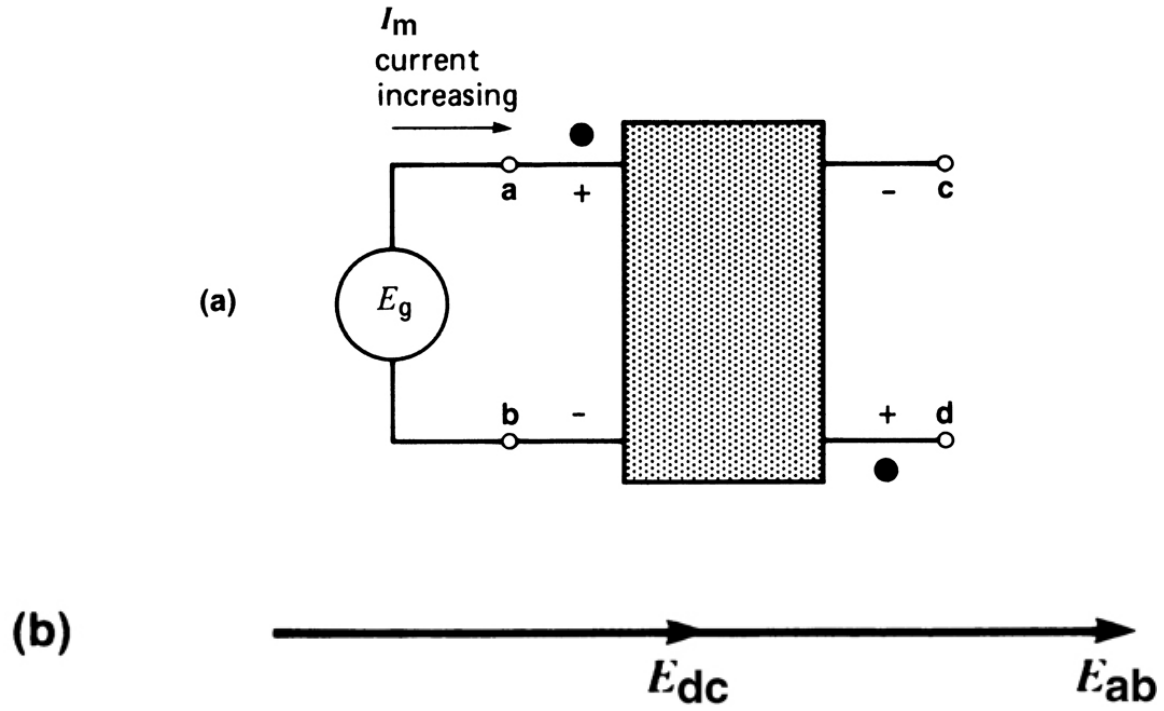
FIGURE 9-7 **a. Instantaneous polarities when the magnetizing current is increasing. b. Phasor relationship.**



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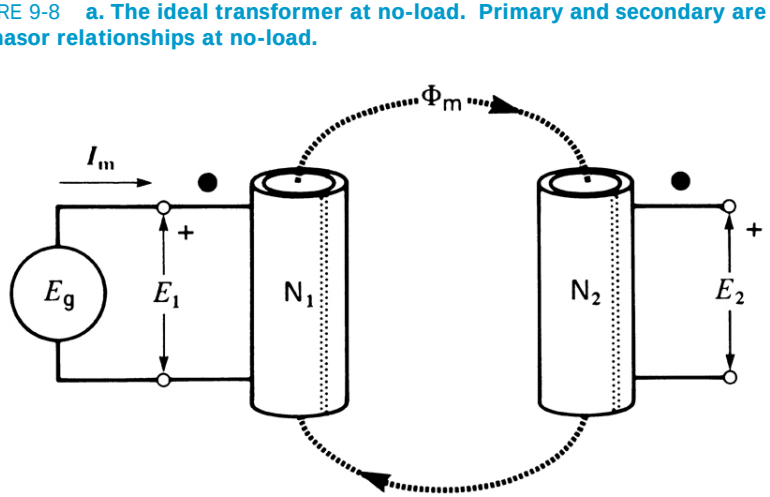
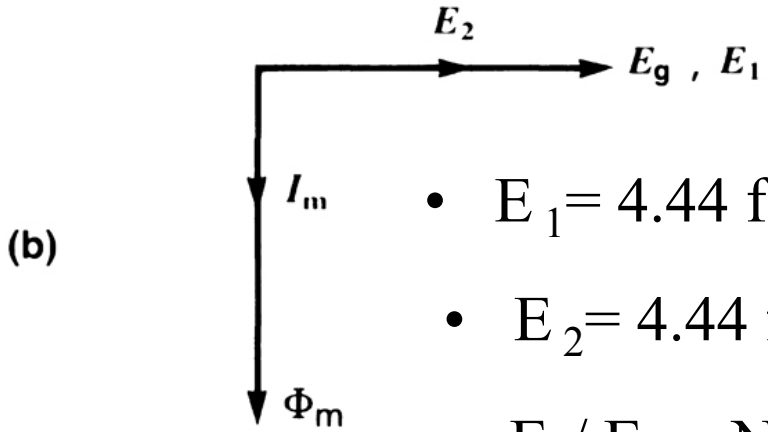
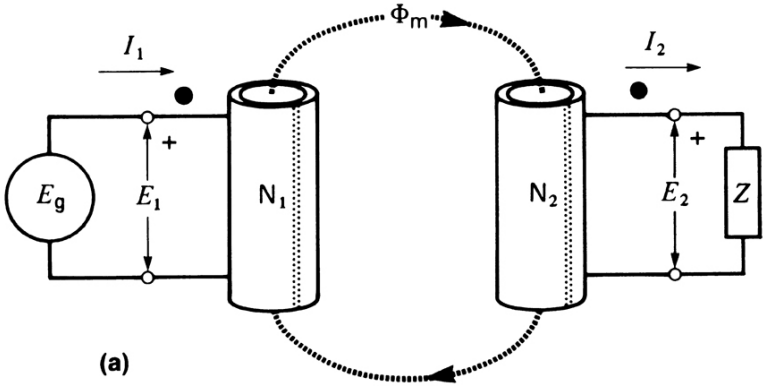
# Ideal Transformer

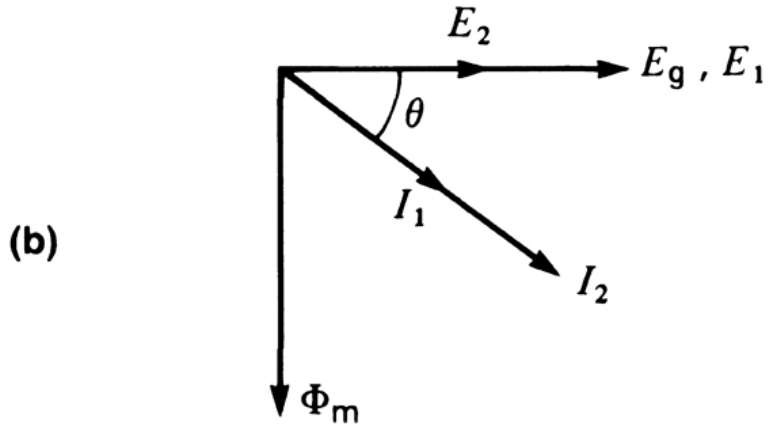
FIGURE 9-8 **a. The ideal transformer at no-load. Primary and secondary are linked by a mutual flux b. Phasor relationships at no-load.**




- $E_1 = 4.44\ f\ N1\ \Phi_{max}$
- $E_2 = 4.44\ f\ N2\ \Phi_{max}$
- $E_1 / E_2 = N1/N2$




- $I_1 / I_2 = N2/N1$



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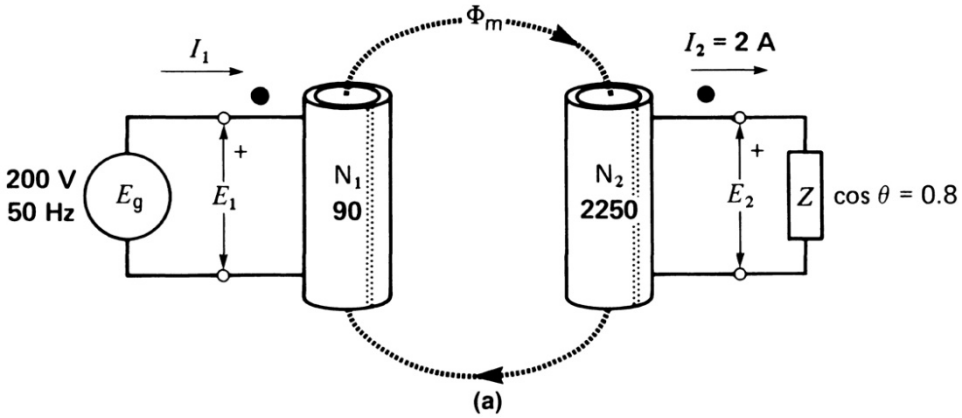
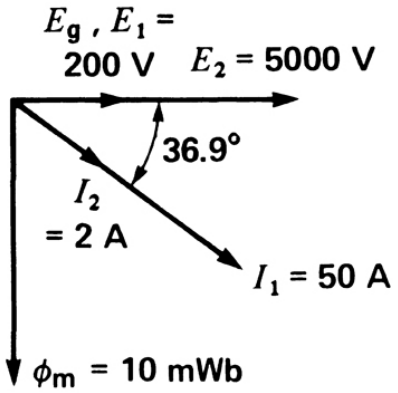
FIGURE 9-10 **a. See Example 9-4. b. Phasor relationships.**

- 90 turns, 2250 turns, 200 V , 50 Hz , load 2A




- a = N1/N2= 1/25
- $I_1$ = 25x2=50 A




(b)



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