

ELETTROTECNICA CIRCUITALE

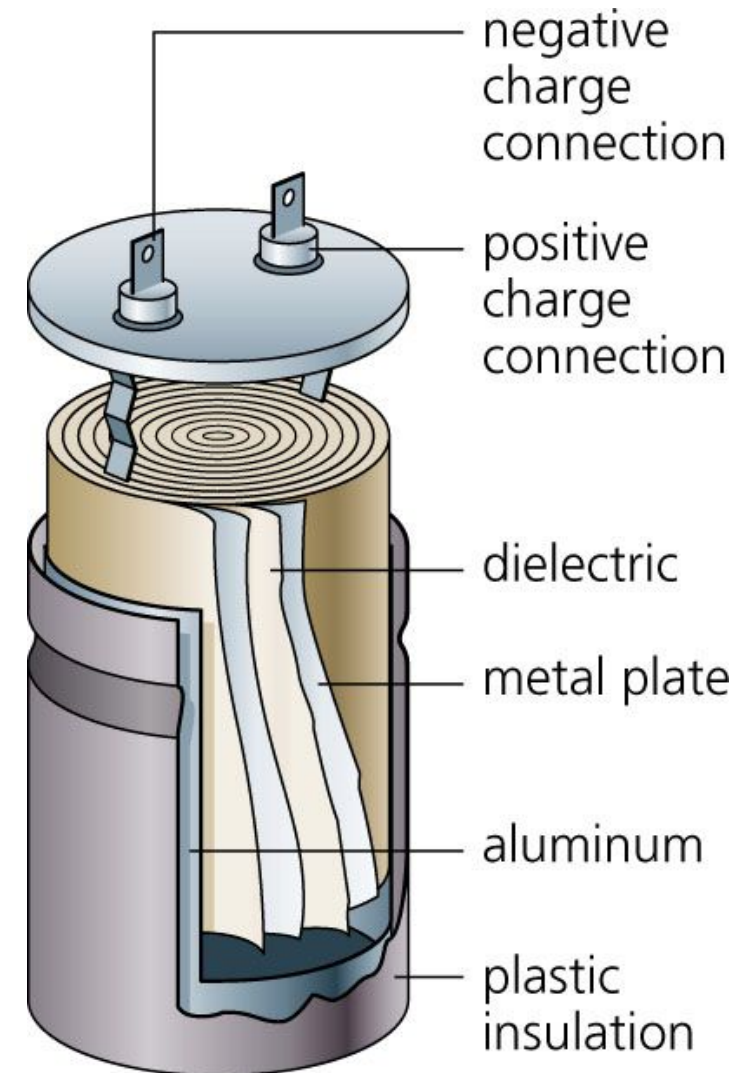
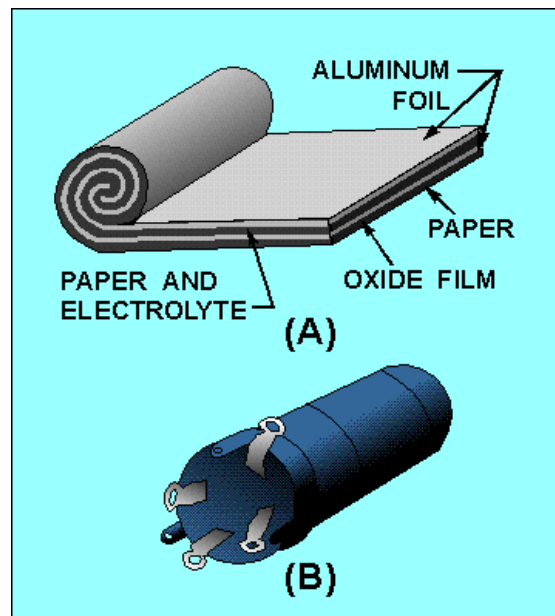
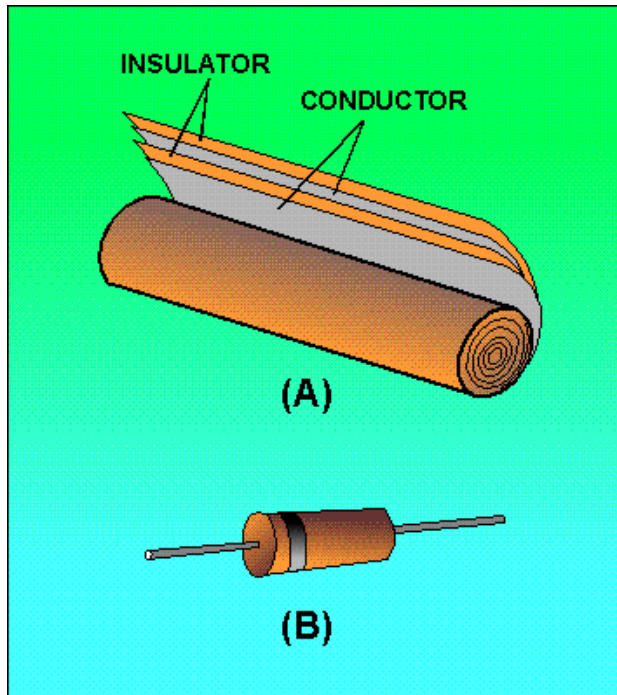
M. GUARNIERI

**BIPOLI DINAMICI**  
**DOPPI BIPOLI DINAMICI**  
**cap. 12-13**

# CONDENSATORI DIELETTRICI

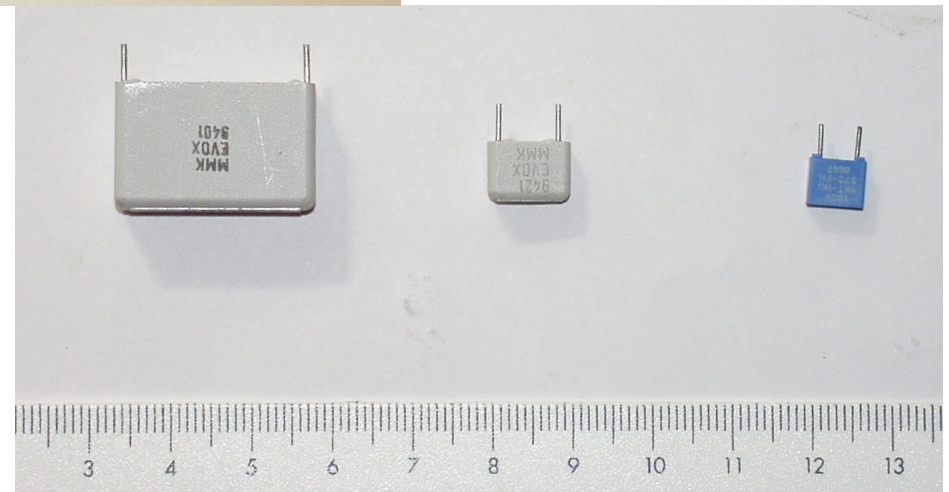
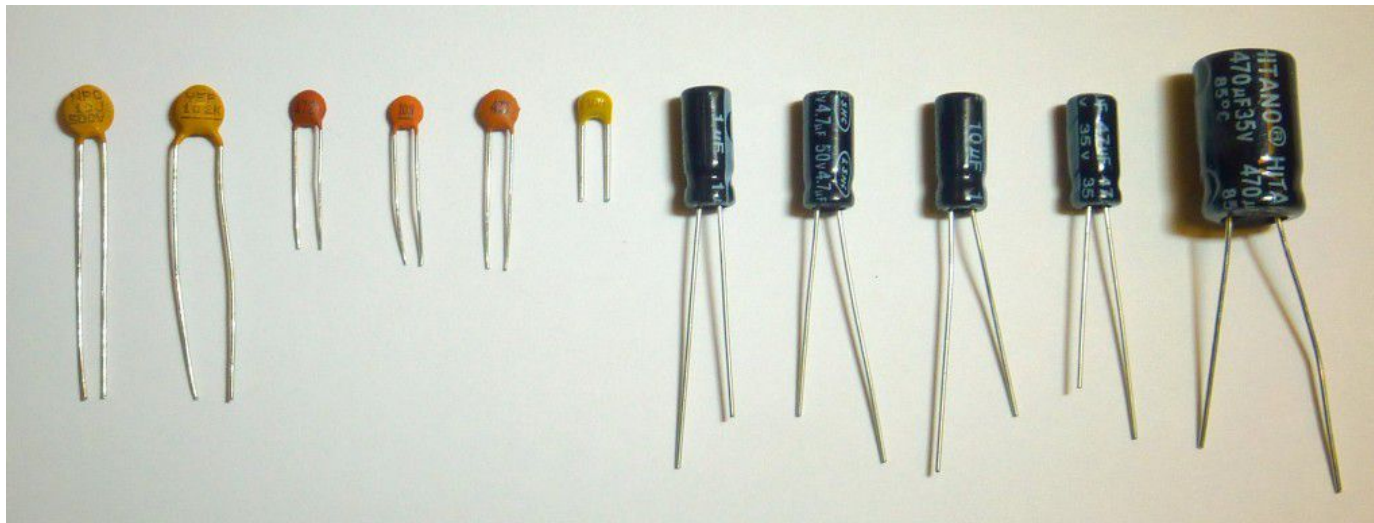


# CONDENSATORI DIELETTRICI



# CONDENSATORI

Condensatori dielettrici per tensioni di alcuni volt,  
adatti ad applicazioni di segnale (pF–  $\mu$ F)



# CONDENSATORI

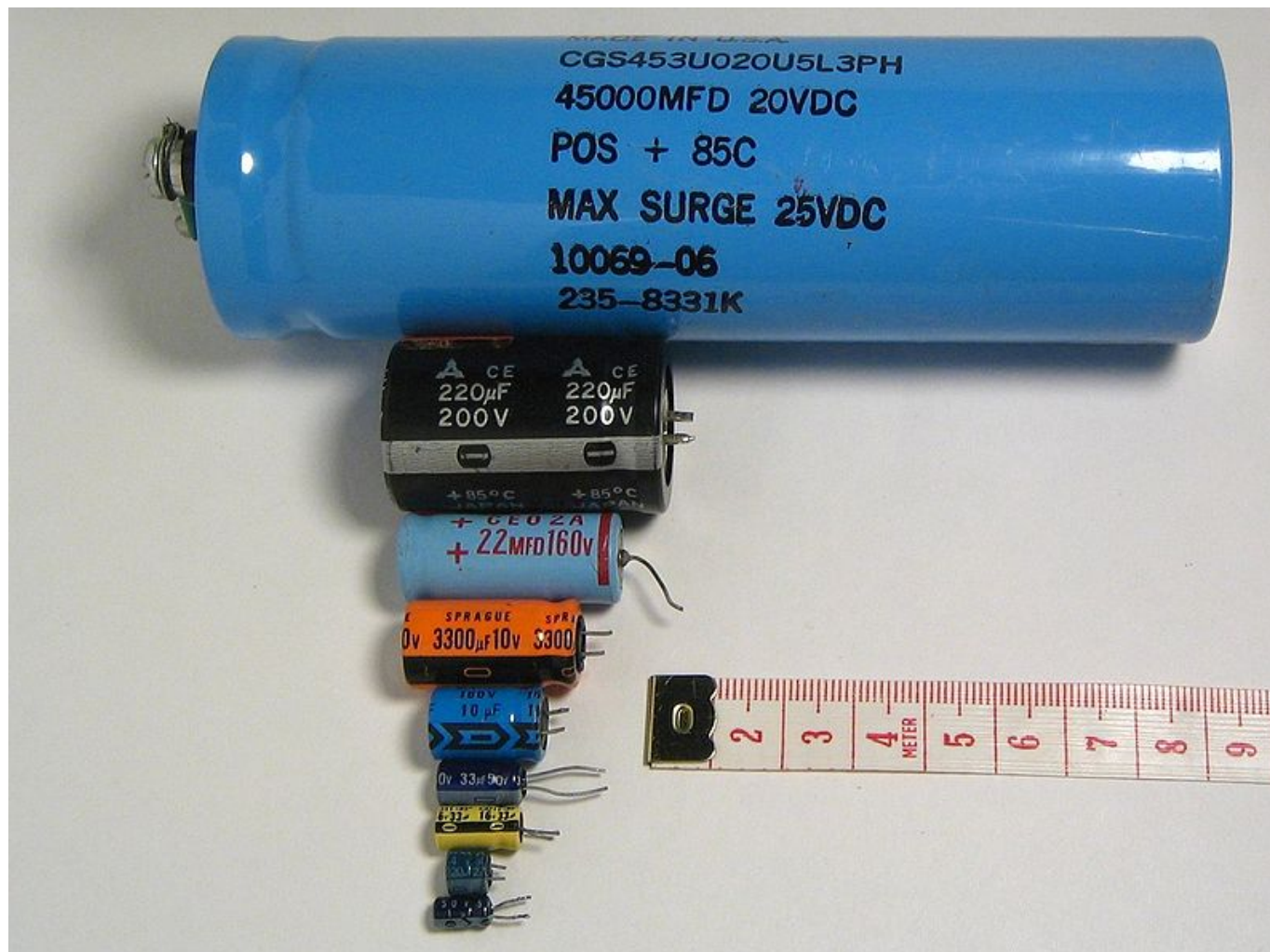
Condensatori dielettrici per condensatori per tensioni di centinaia e migliaia di volt, idonei ad applicazioni di potenza (pF–  $\mu$ F)



# CONDENSATORI

Condensatori elettrolitici  $10^0$ – $10^2$  V.

Le capacità sono dell'ordine di  $10^{-6}$ – $10^0$  F



# CONDENSATORI

Supercondensatori da  $10^0$ – $10^1$  V.

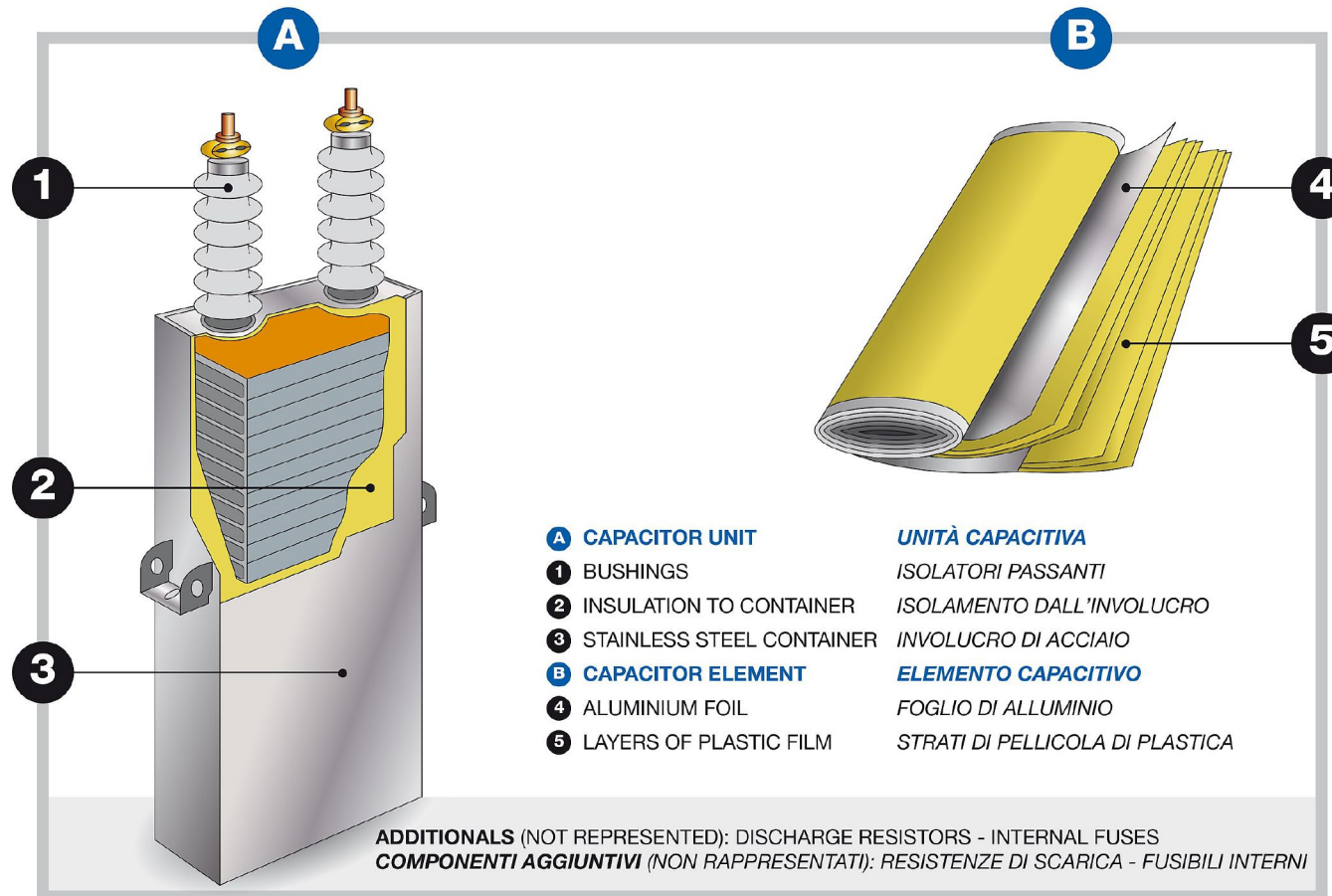
Le capacità sono dell'ordine di  $10^2$ – $10^3$  F



# CONDENSATORI

per AT da  $10^3-10^5$  V.

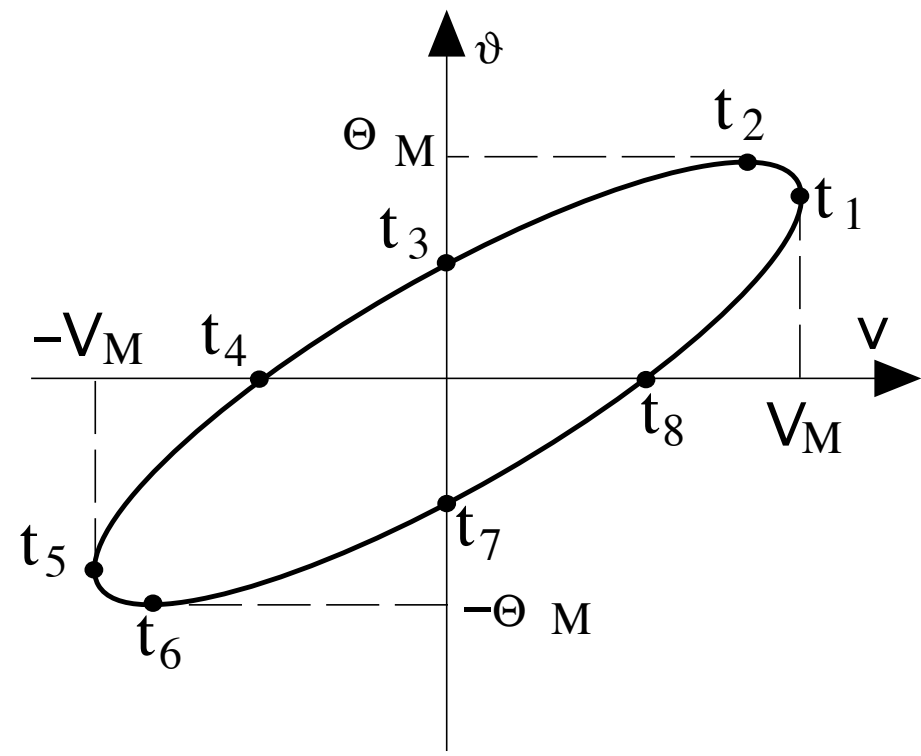
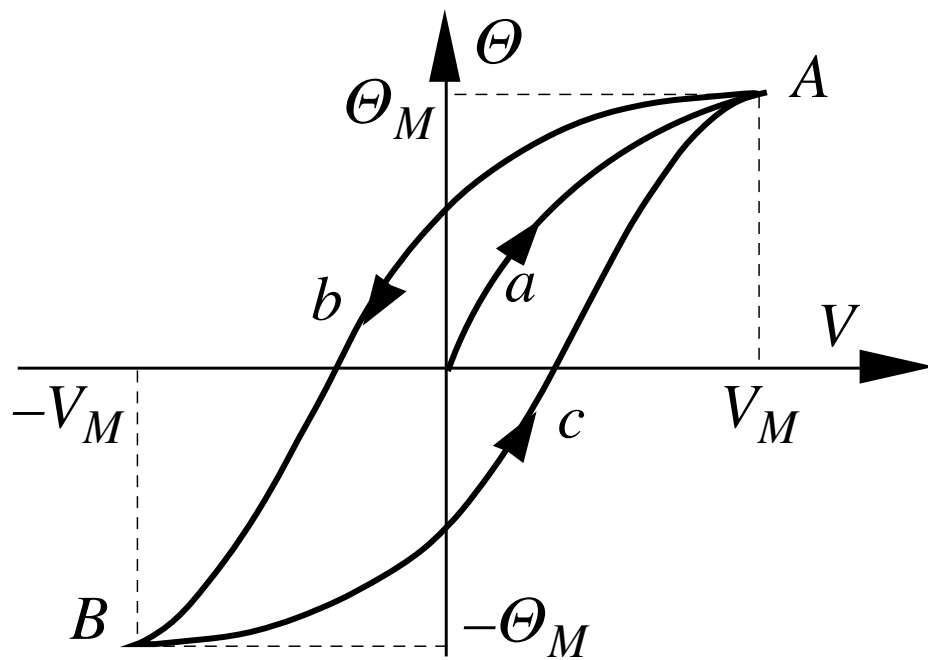
Le capacità sono dell'ordine di  $10^{-3}-10^{-2}$  F



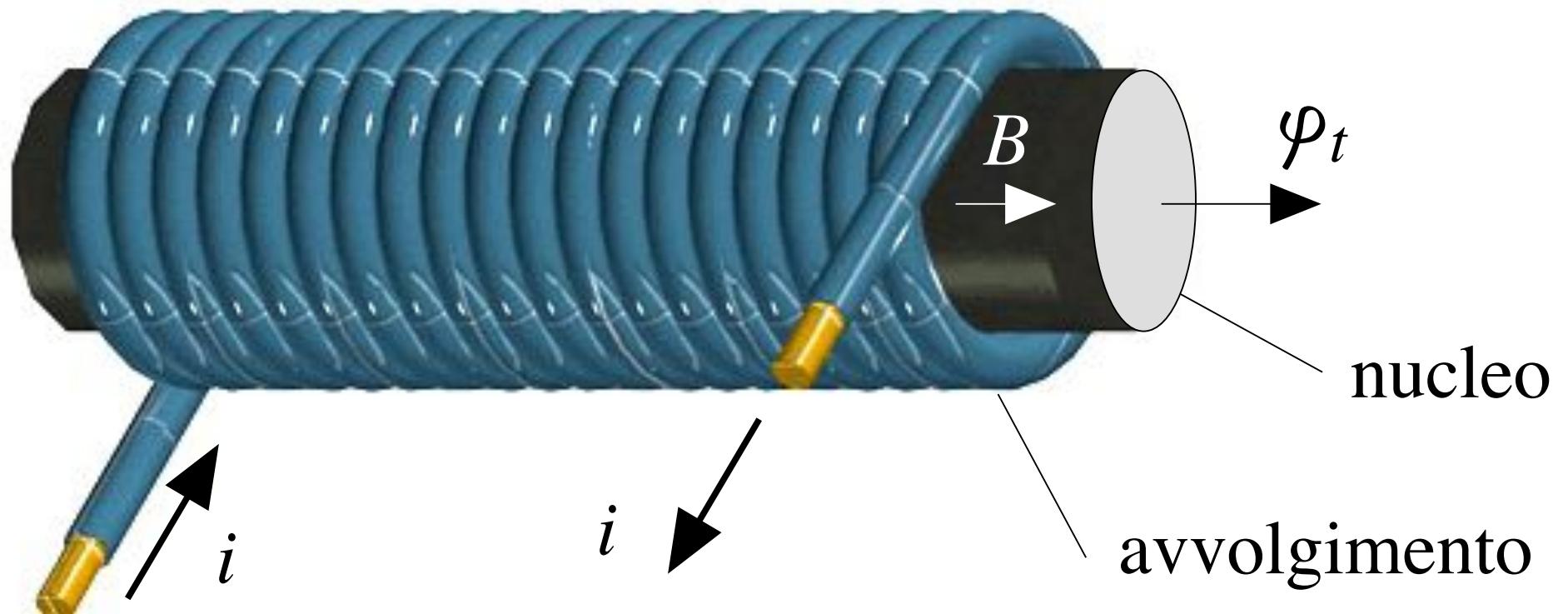


# CONDENSATORI

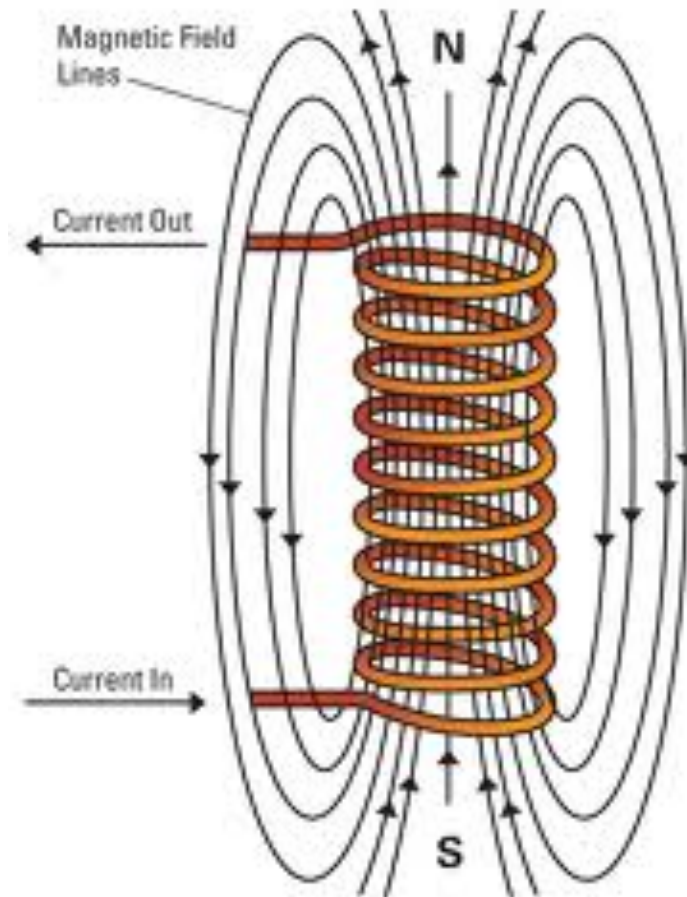
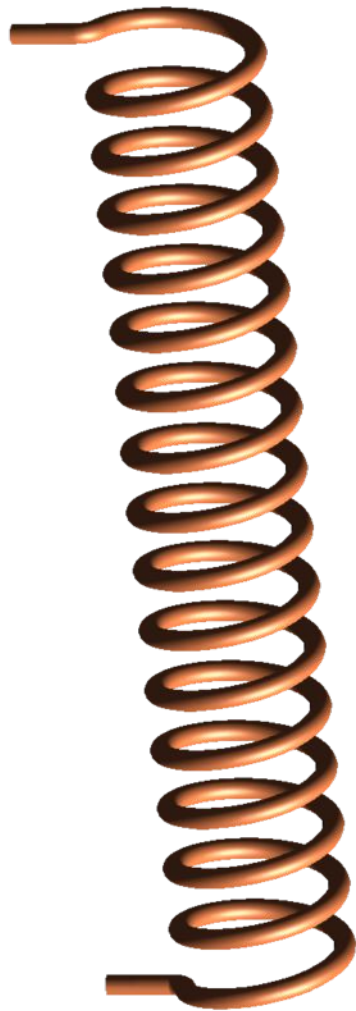
COMPORTAMENTI ISTERETICI E DISSIPATIVI



# AVVOLGIMENTI INDUTTORI

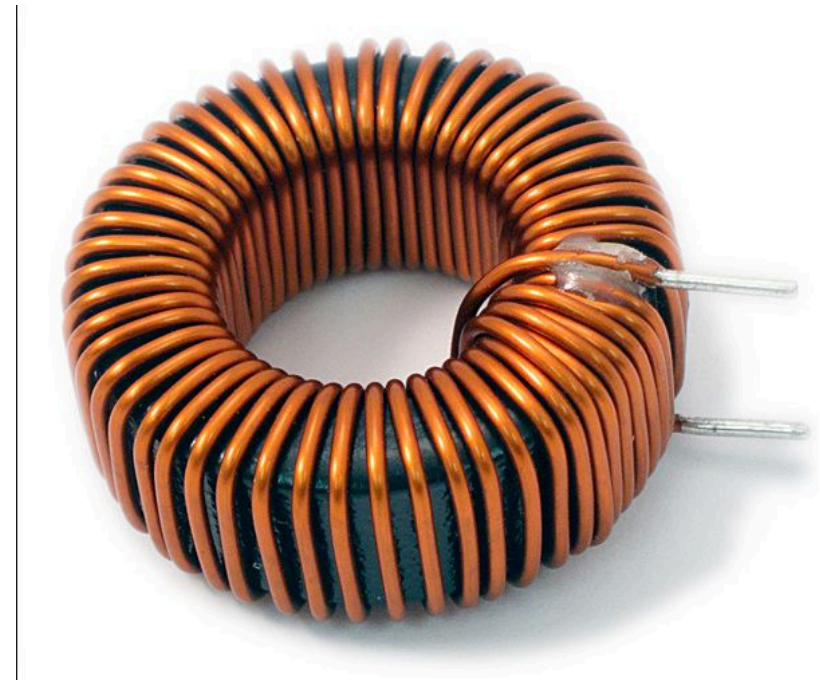


# AVVOLGIMENTI INDUTTORI



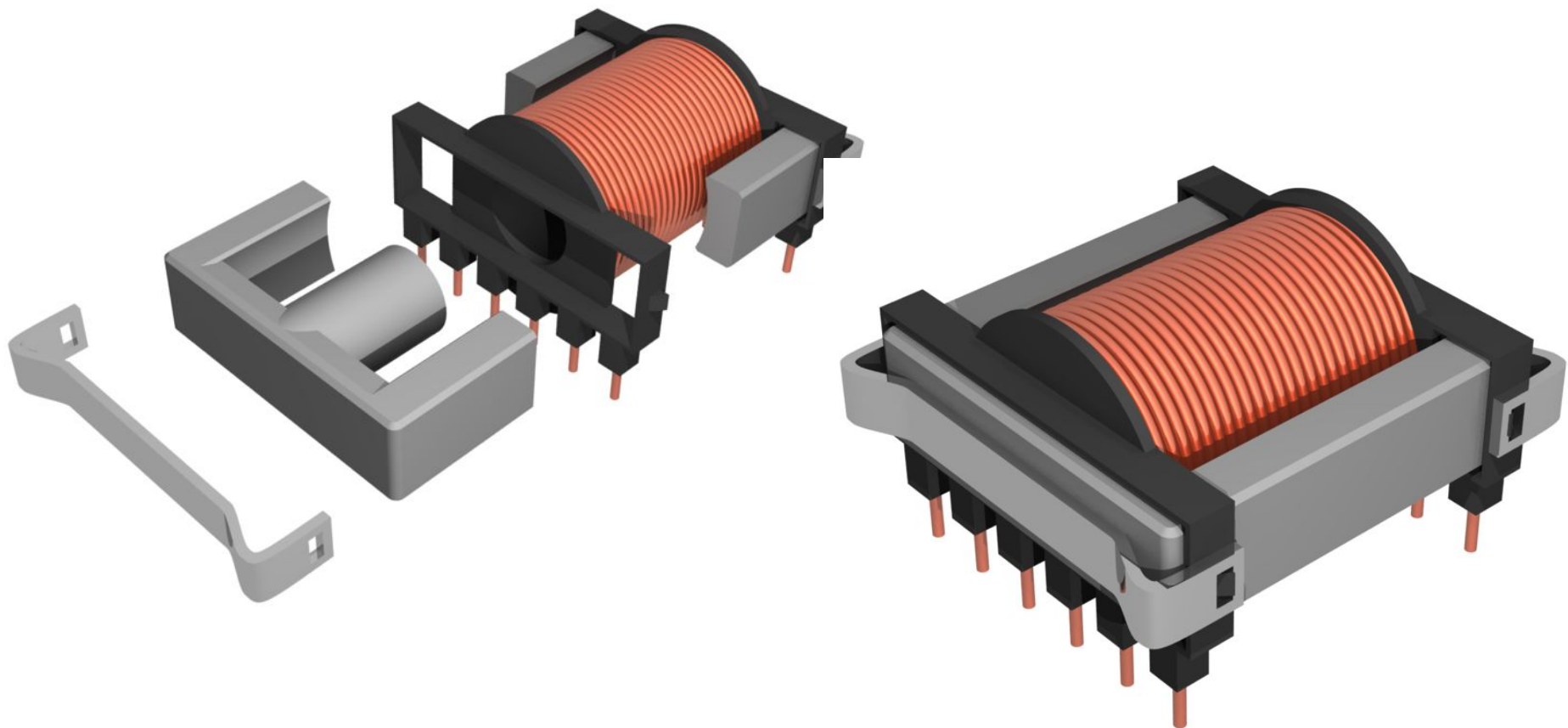
# INDUTTORI

Avvolgimenti induttori solenoidale e toroidale per correnti di  $10^0$ – $10^1$  A ed induttanze di frazioni di mH



# INDUTTORI

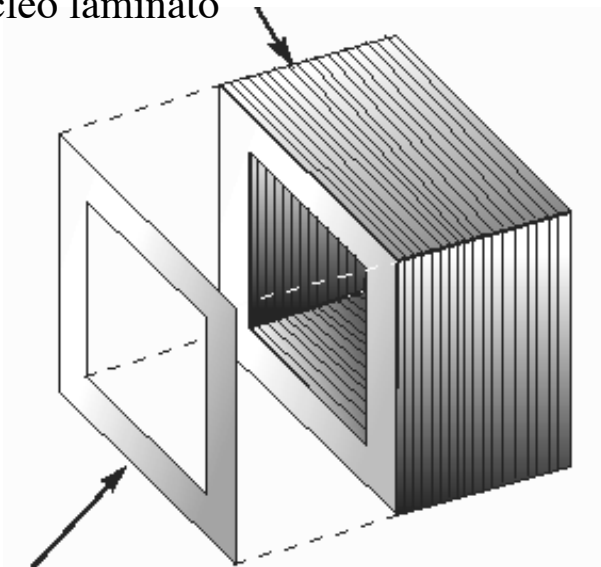
Avvolgimenti induttori solenoidali con nucleo a mantello



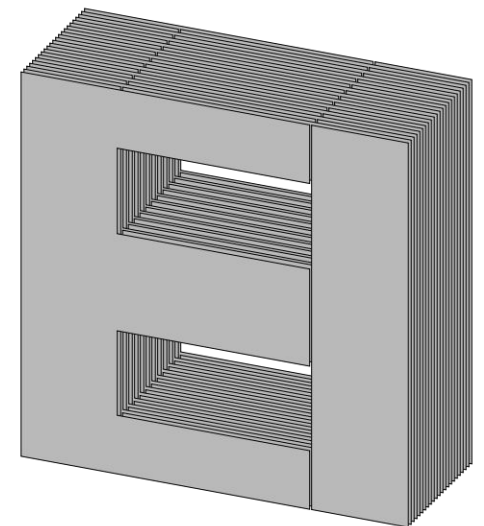
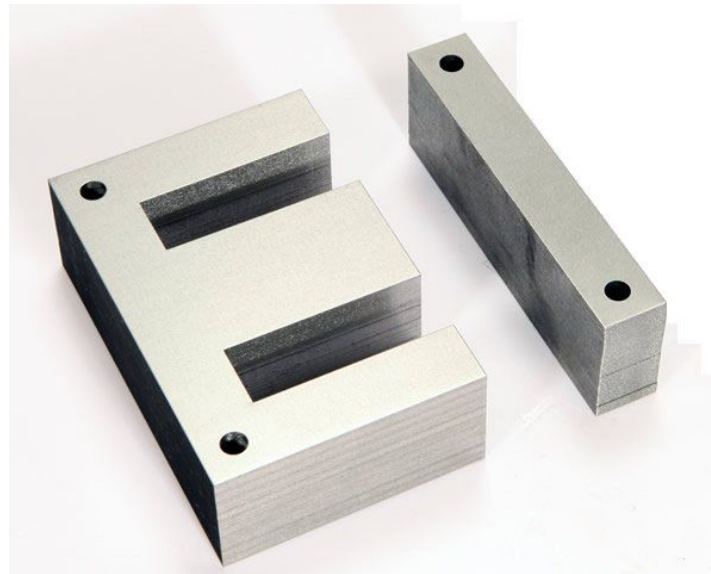
# INDUTTORI

Nuclei magnetici

nucleo laminato

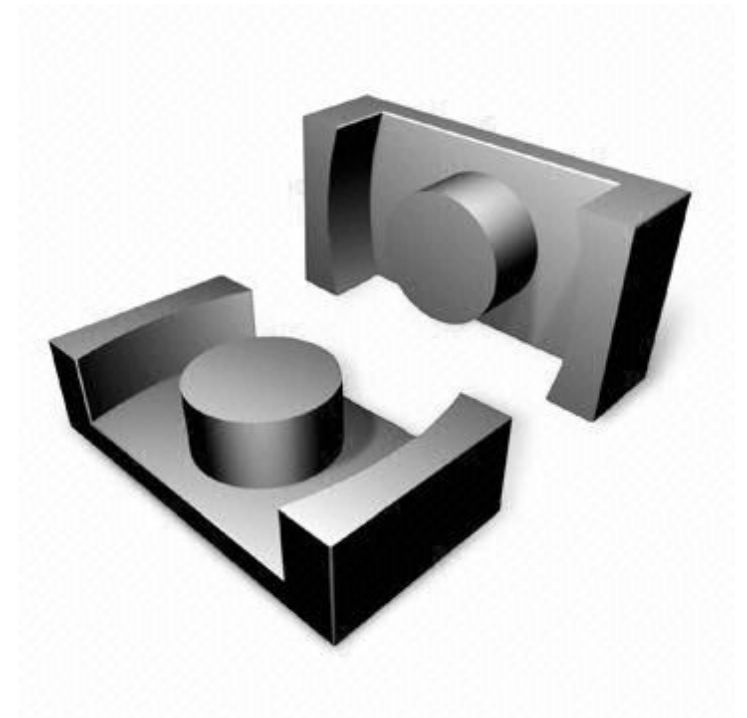
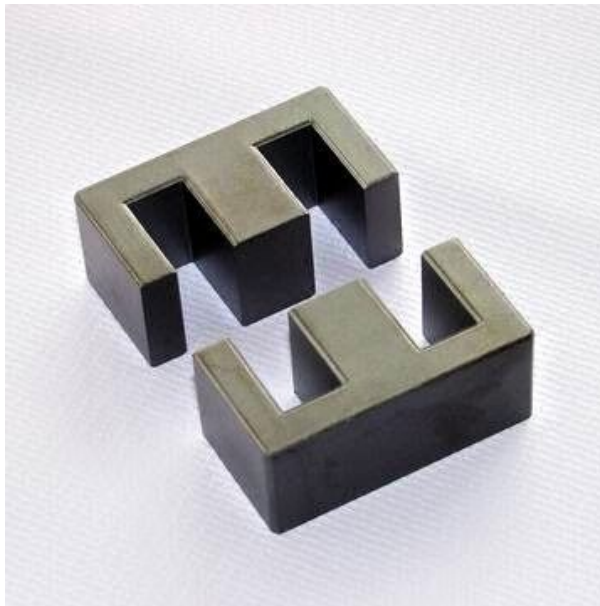
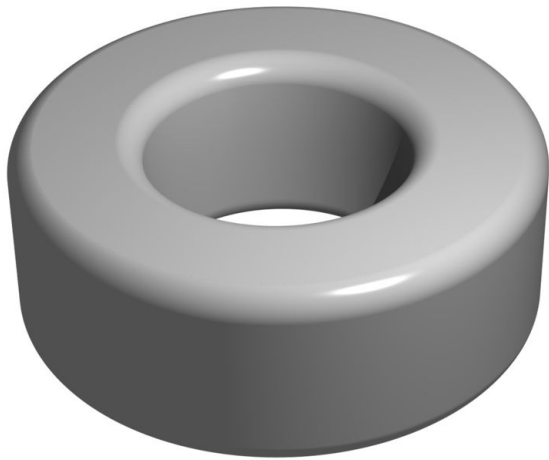


lamierino



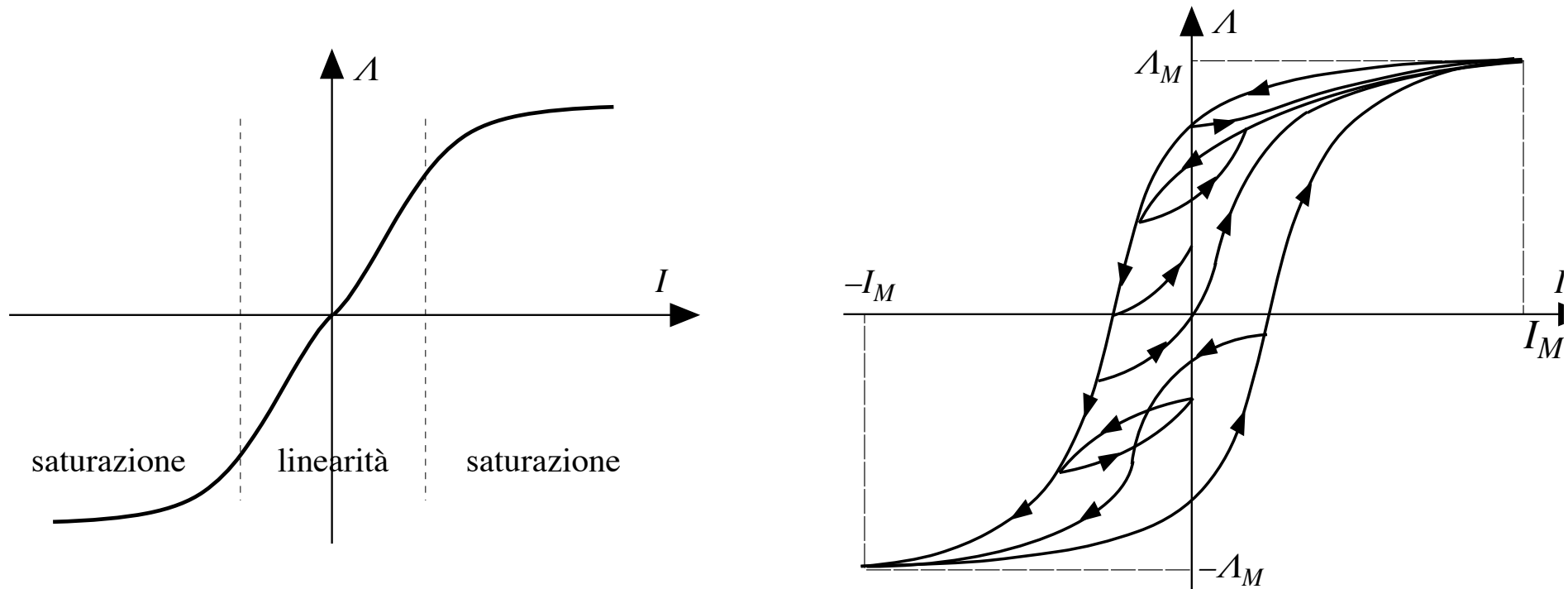
# INDUTTORI

Nuclei magnetici



# INDUTTORI

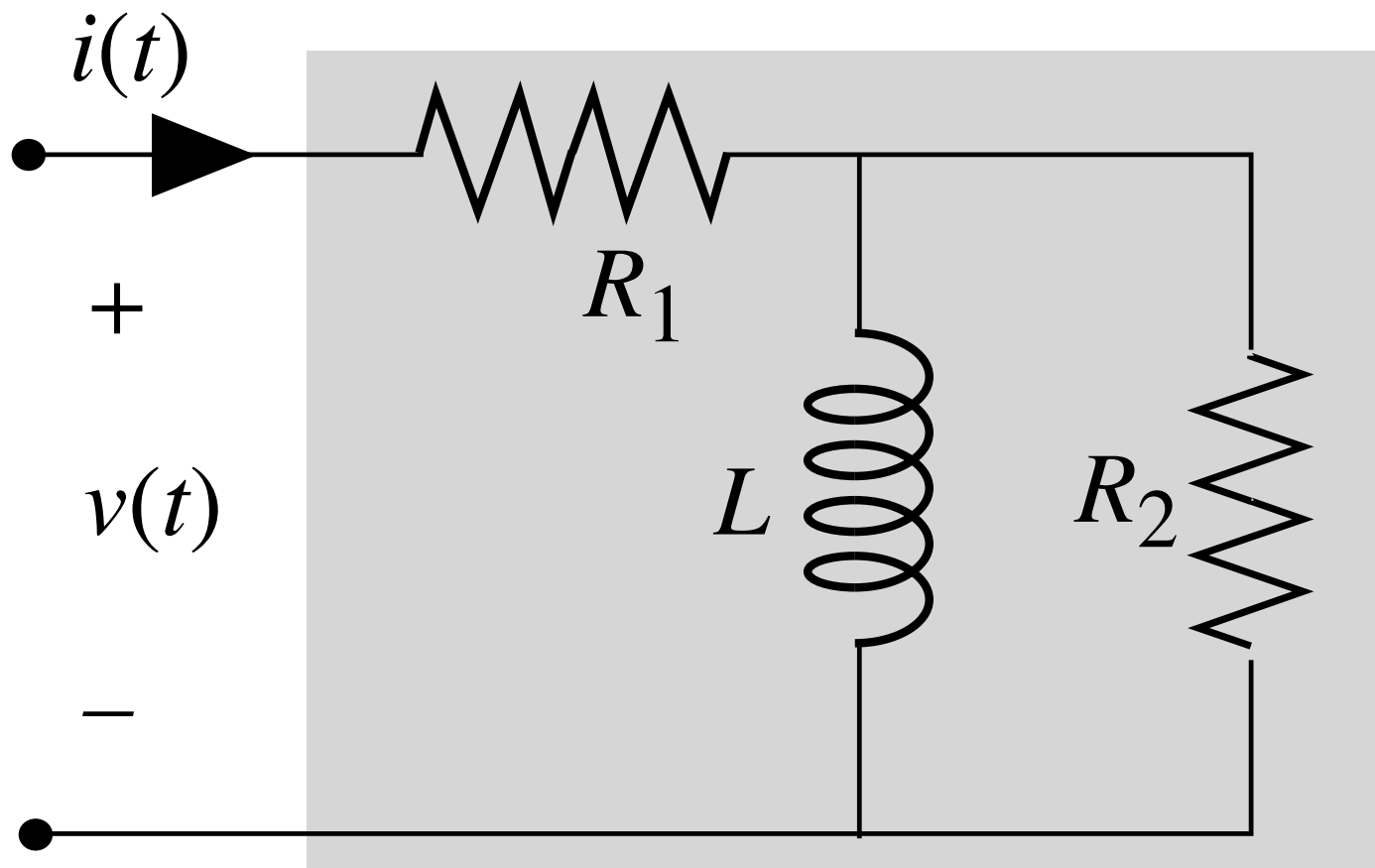
Nuclei magnetici





# INDUTTORI

Isteresi del nucleo

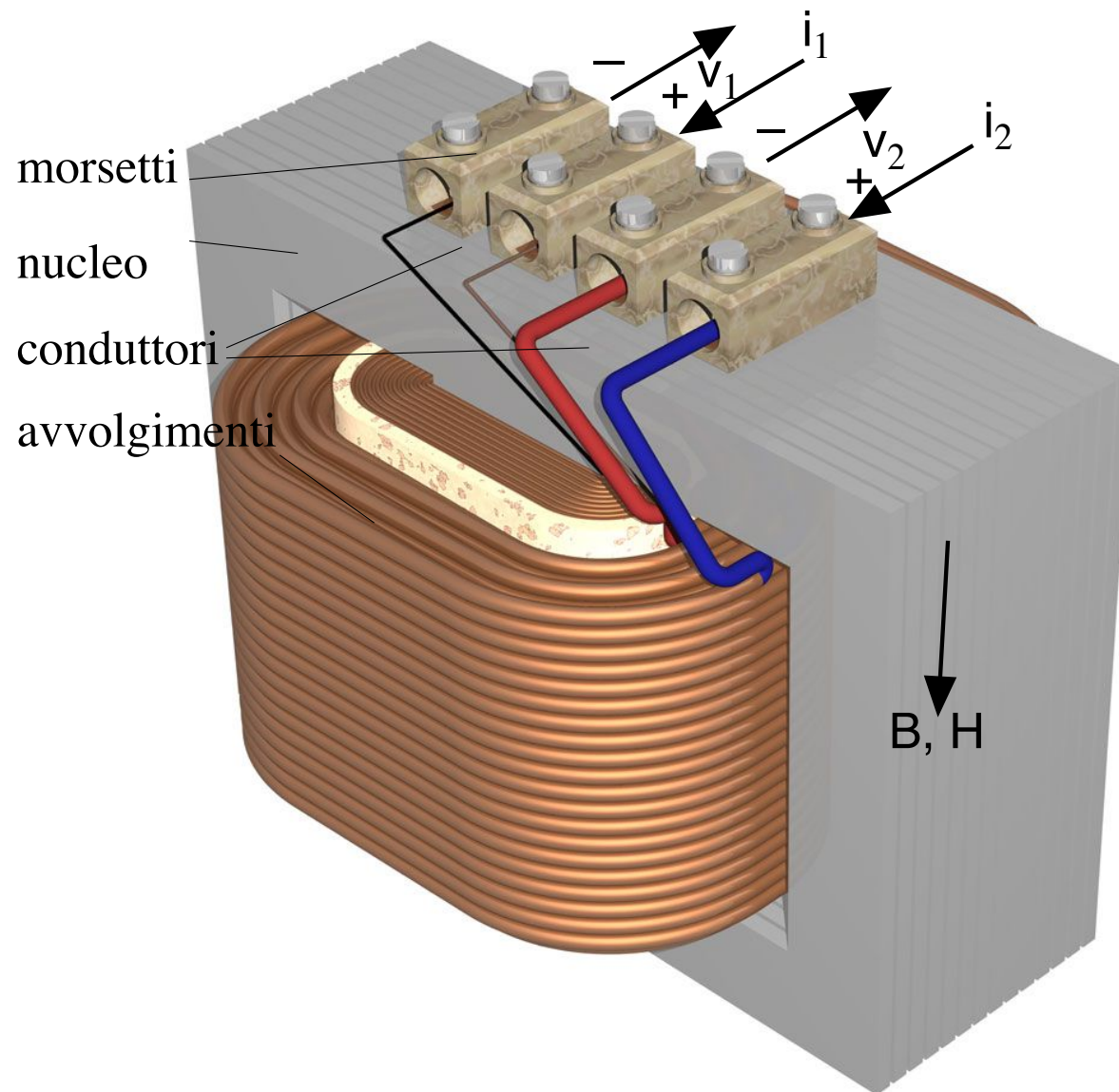


# TRASFORMATORE A INDUZIONE

mutuo induttore costruito in modo da approssimare il trasformatore ideale

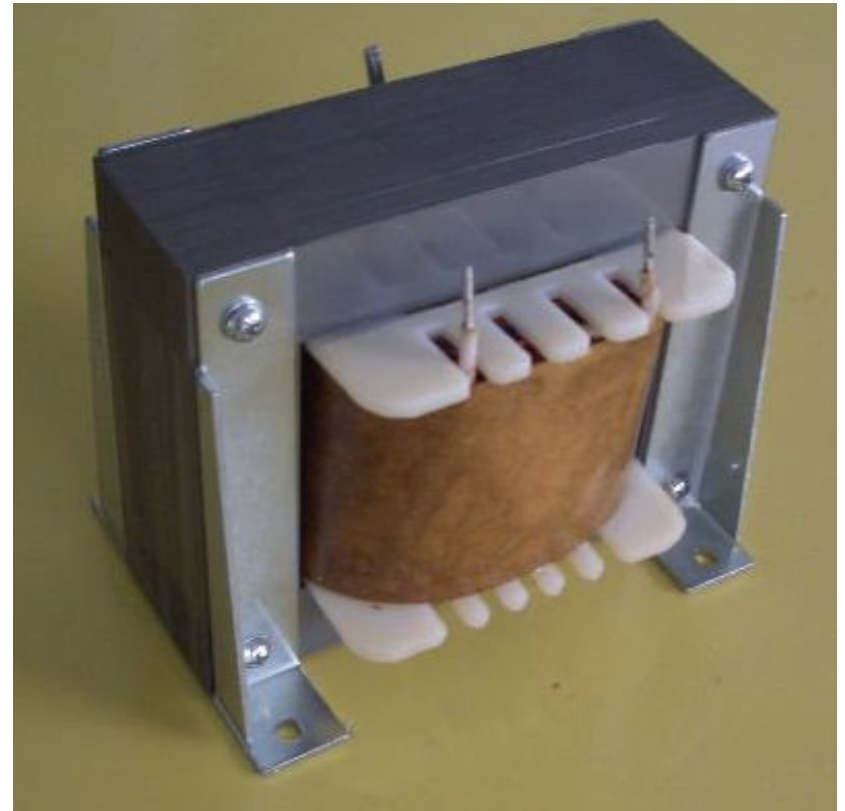
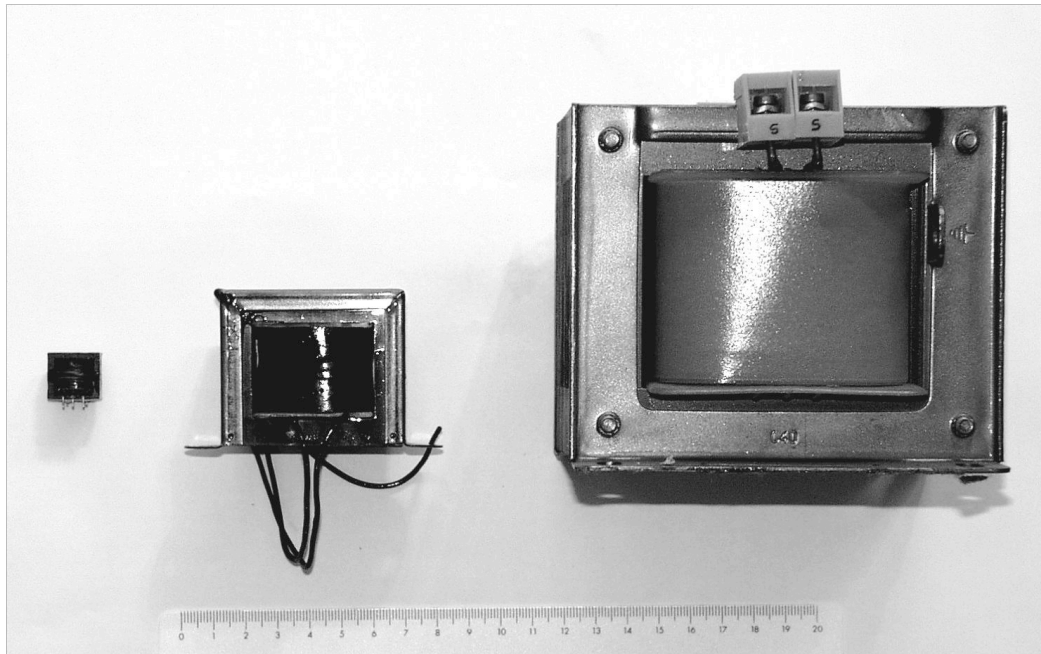


# TRASFORMATORE A INDUZIONE



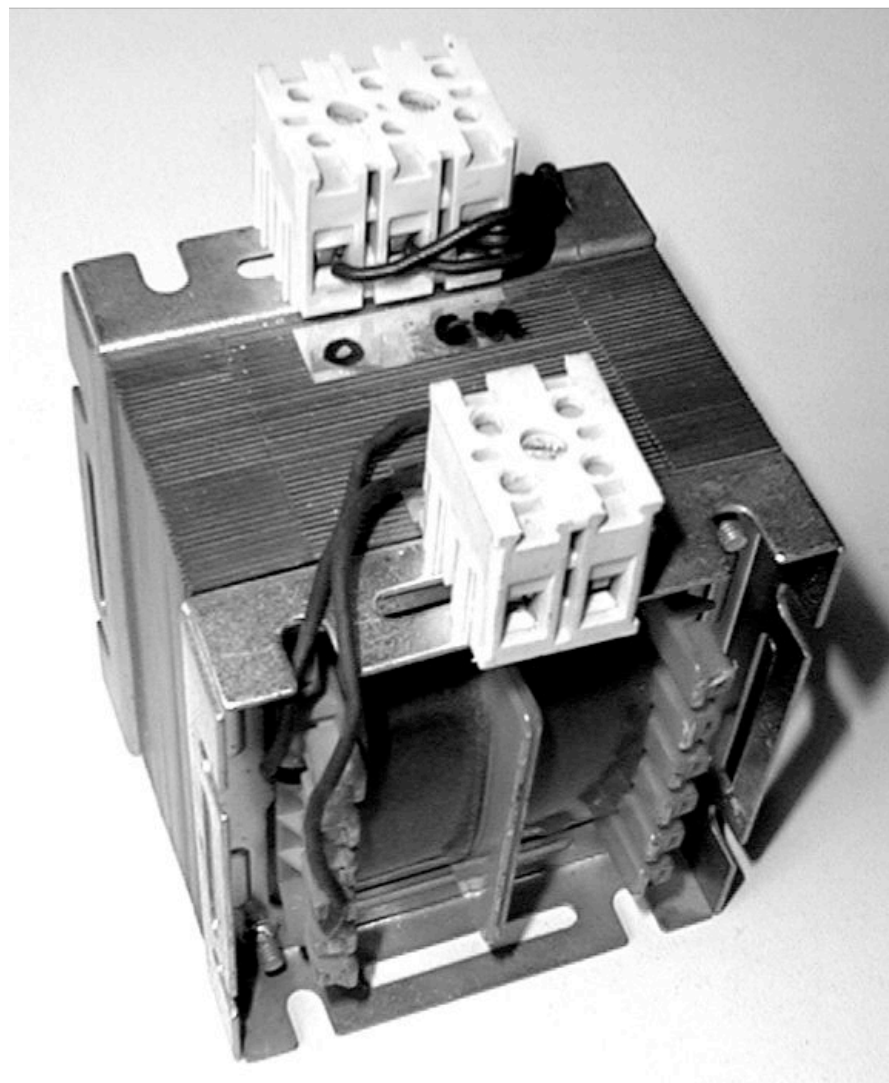
# TRASFORMATORE A INDUZIONE

piccola potenza:  $10^0$ – $10^2$  W



# TRASFORMATORE A INDUZIONE

medio-piccola potenza:  $10^3$  W



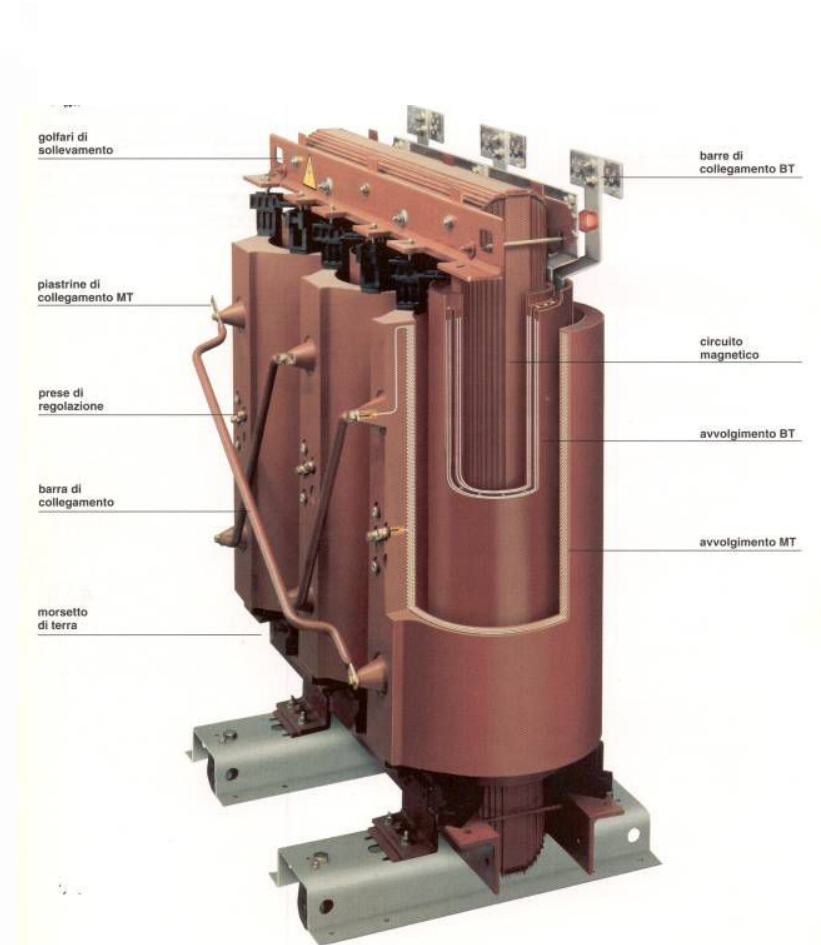
# MUTUI INDUTTORI

trifase:  $10^3$  W



# MUTUI INDUTTORI

trifase:  $10^4$  W



# MUTUI INDUTTORI

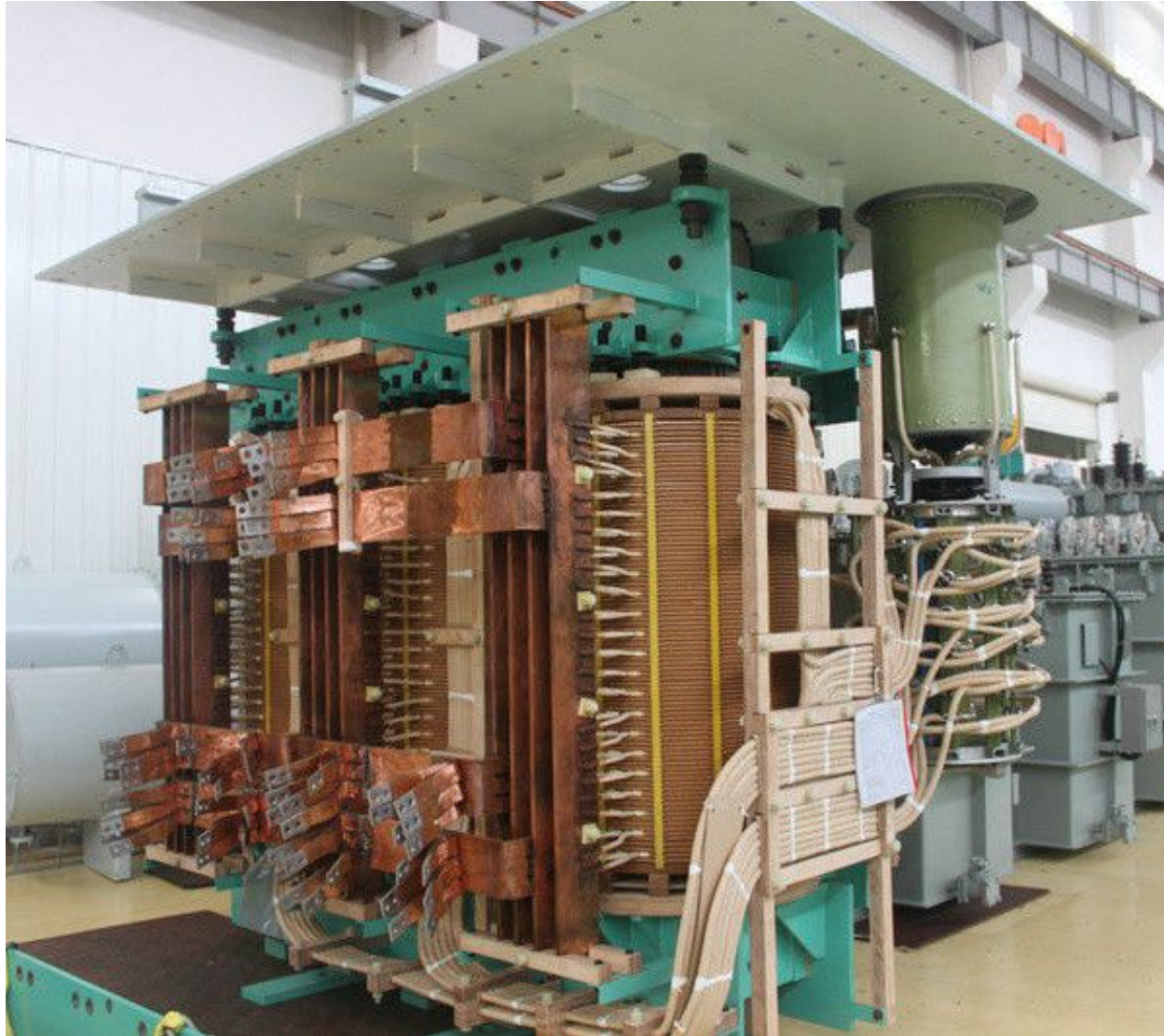
trifase:  $10^5$  W





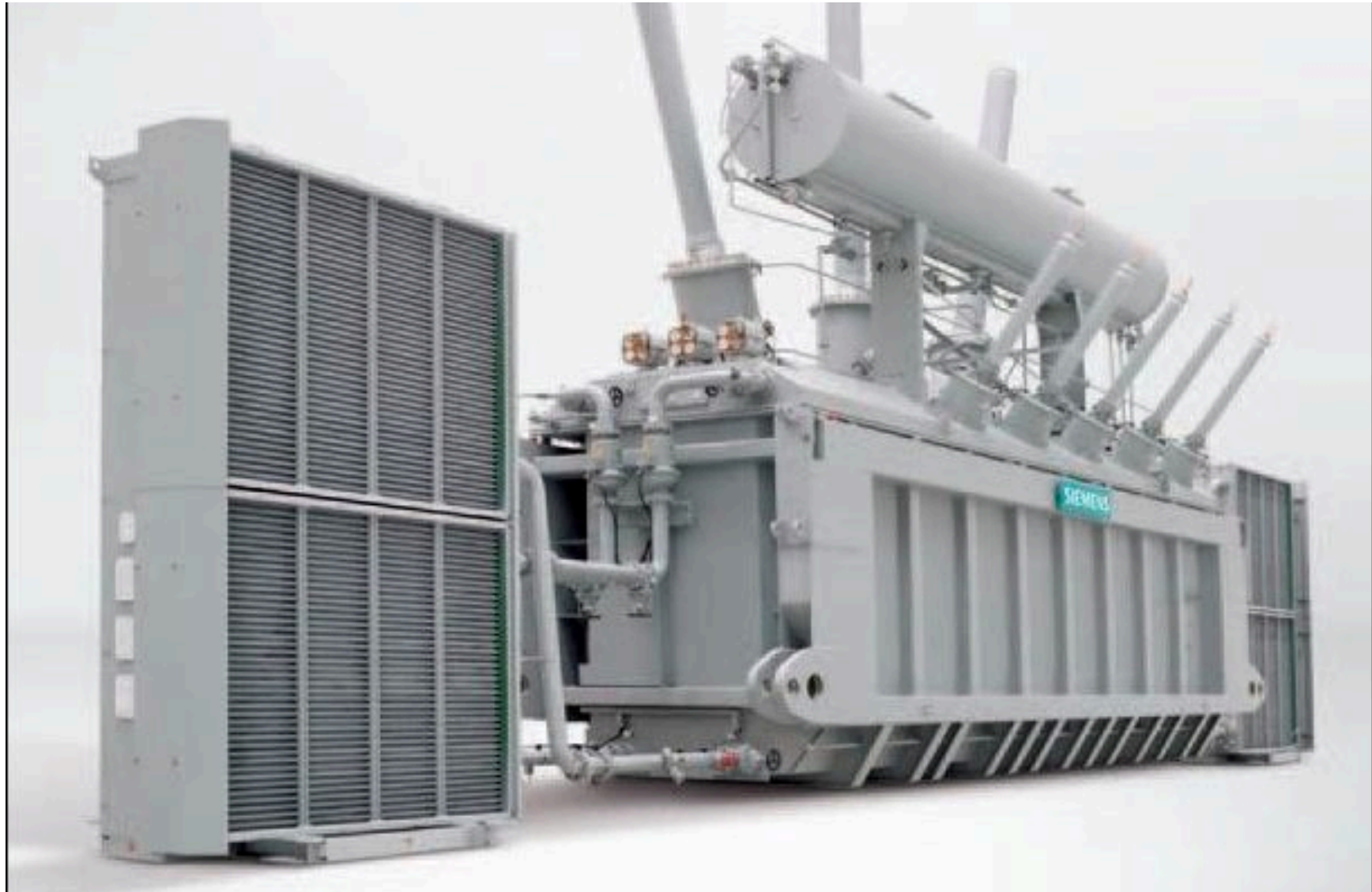
# MUTUI INDUTTORI

trifase:  $10^6$  W



# MUTUI INDUTTORI

trifase:  $10^6$  W



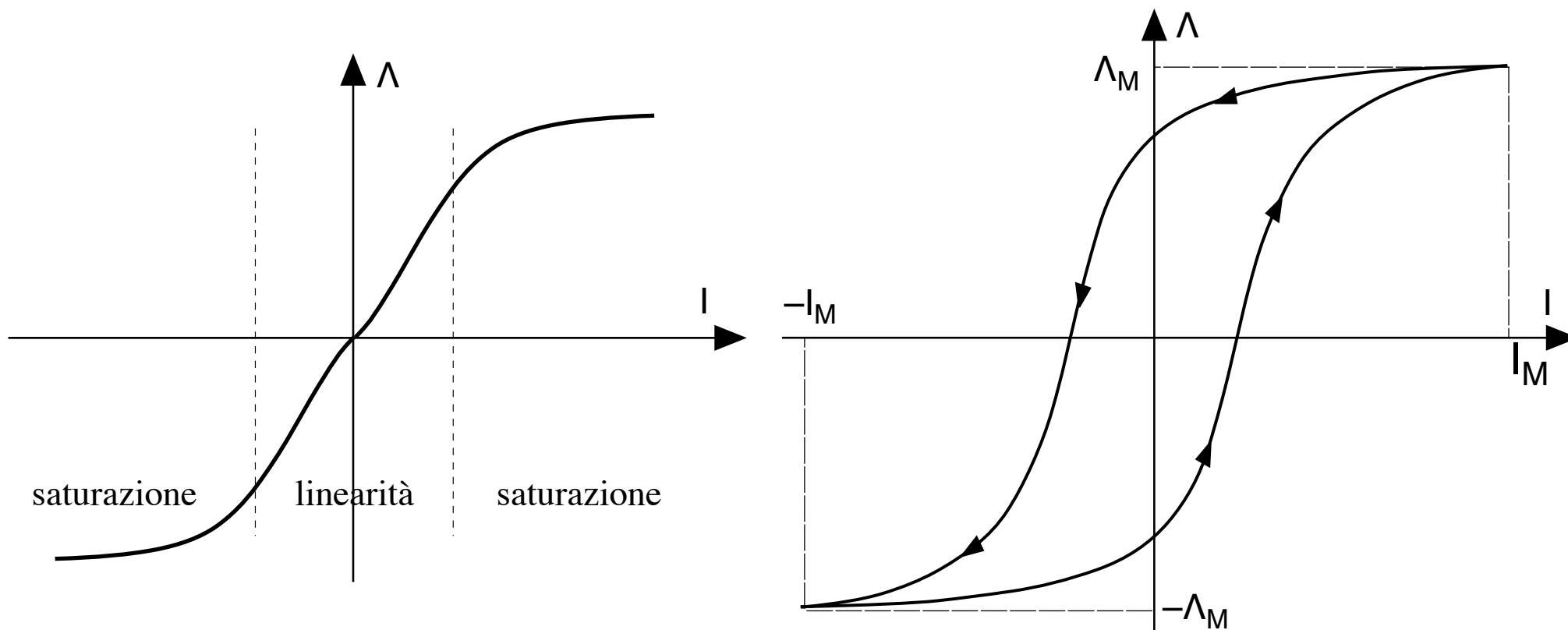
# MUTUI INDUTTORI

trifase:  $10^6$  W



# TRASFORMATORE A INDUZIONE

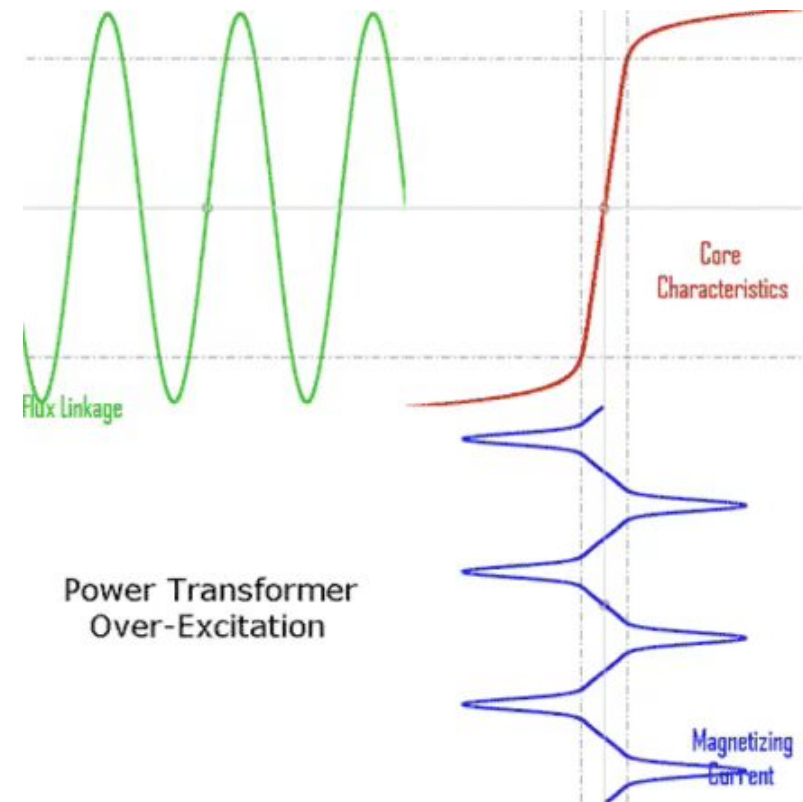
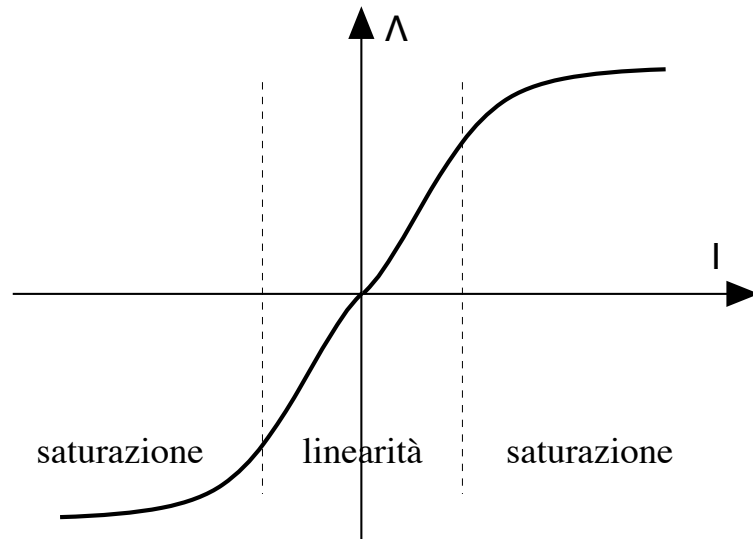
non linearità ed isteresi



$$p_{ist} = \eta f B_M^{1,6-2}$$

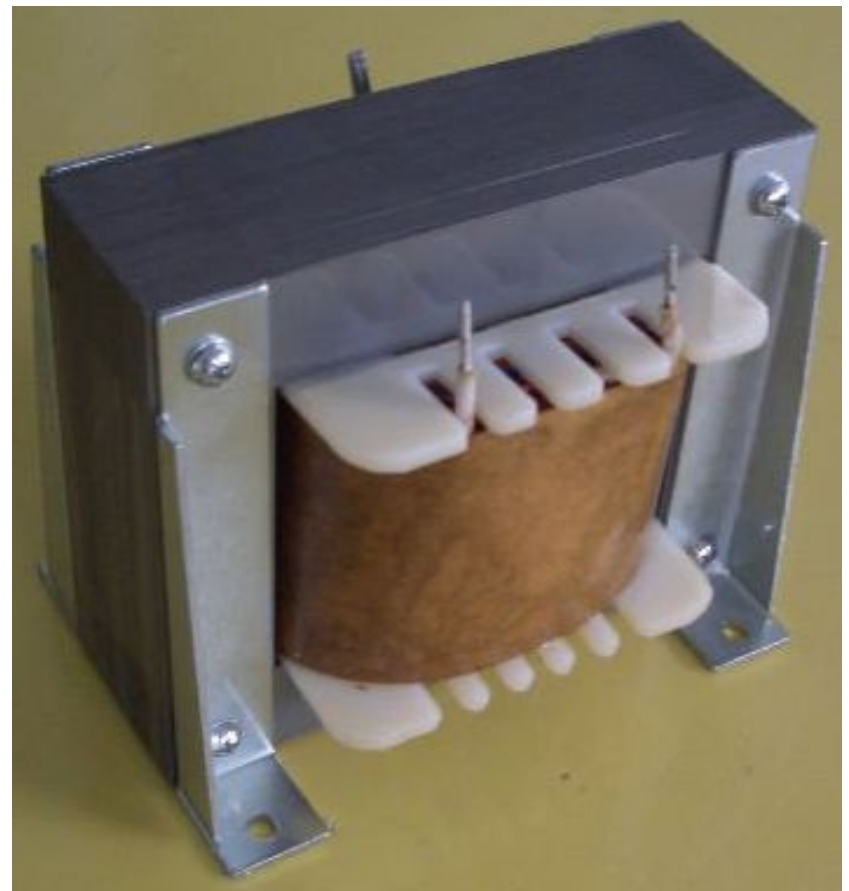
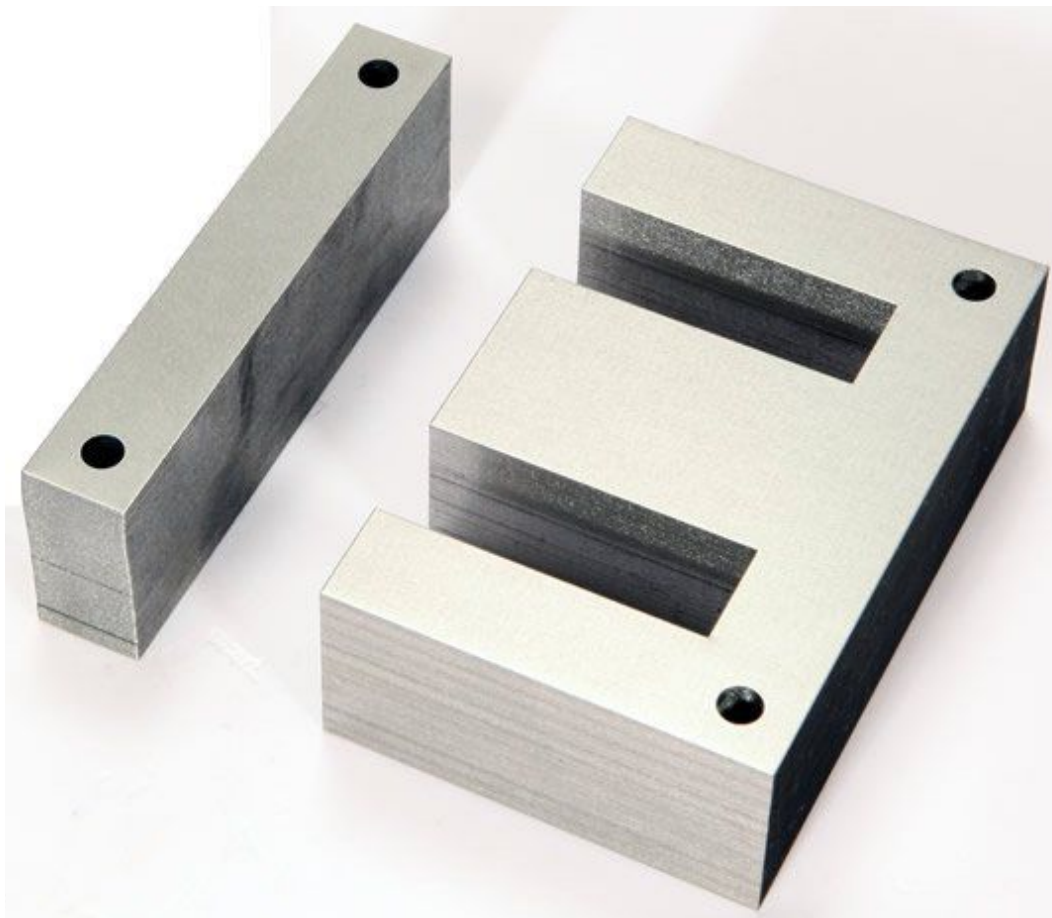
# TRASFORMATORE A INDUZIONE

non linearità ed isteresi



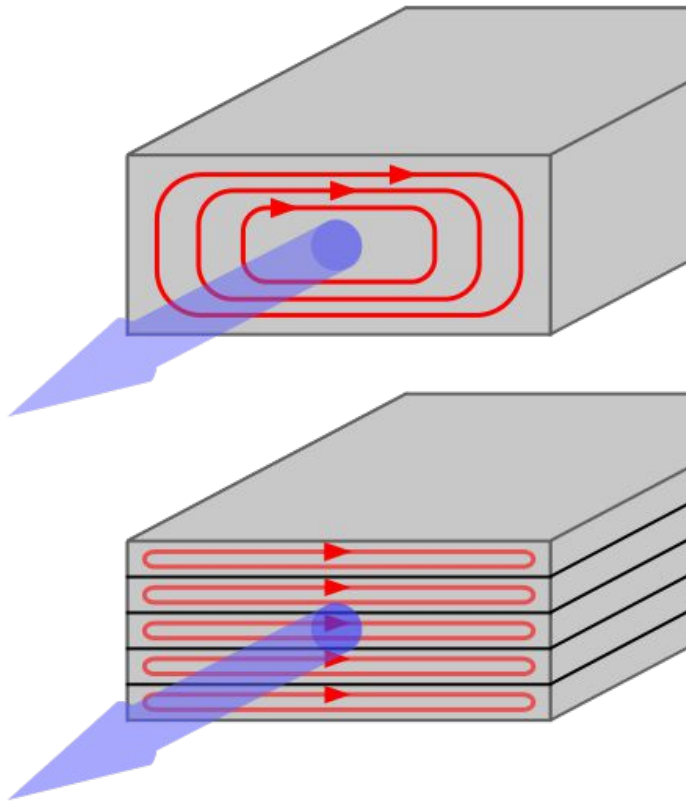
# TRASFORMATORE A INDUZIONE

nucleo a lamierini per piccolo trasformatore – correnti parassite

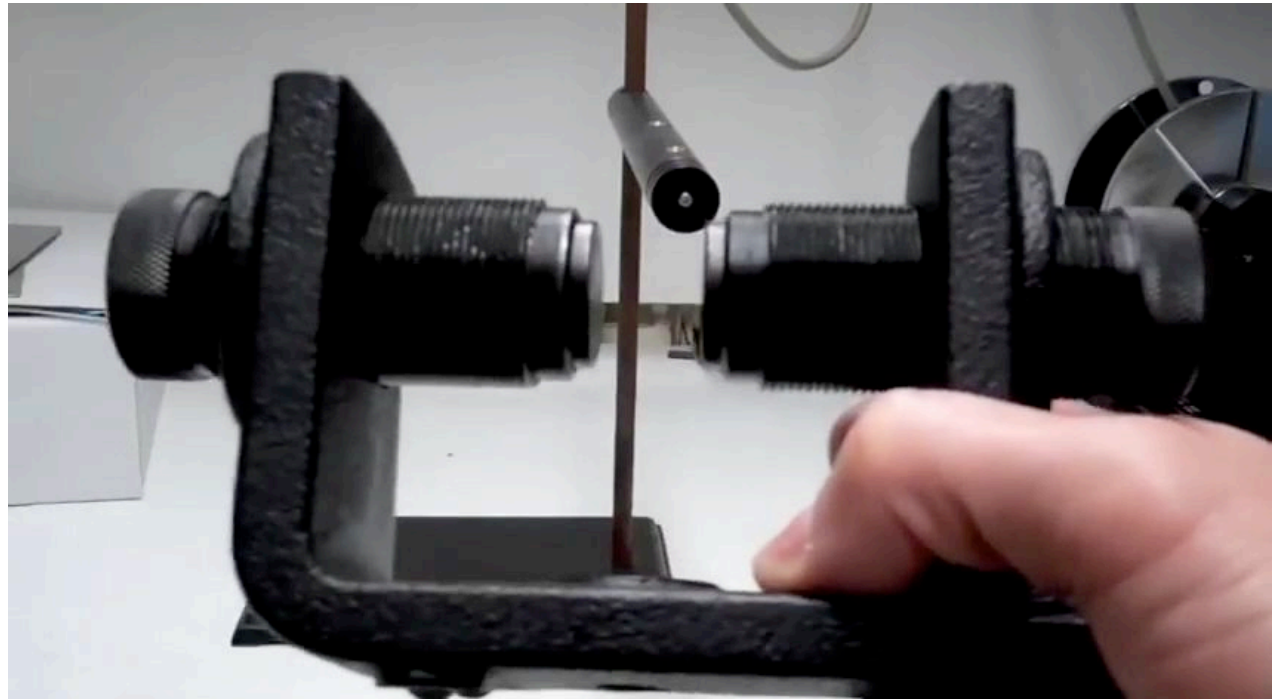


# TRASFORMATORE A INDUZIONE

nucleo a lamierini per piccolo trasformatore – correnti parassite

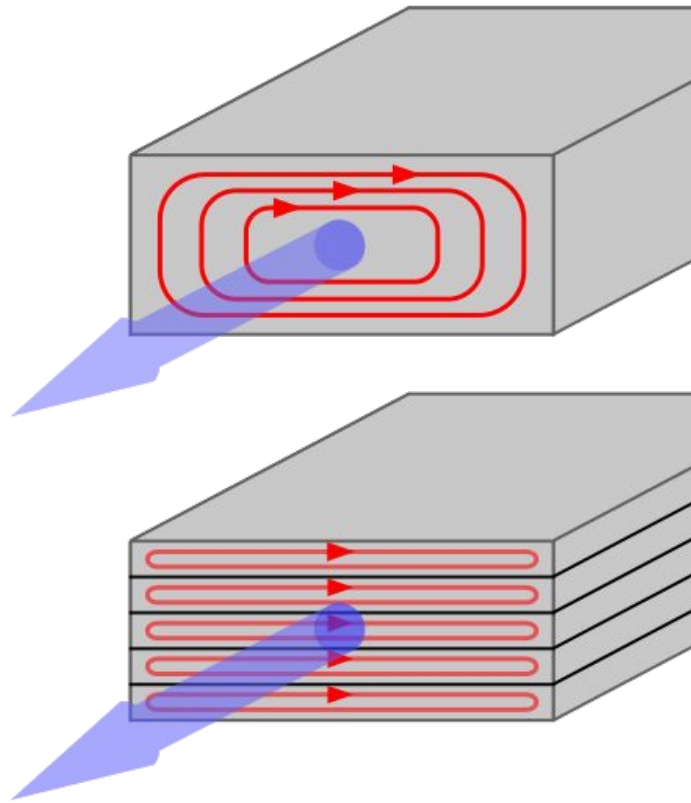


$$P_{cp} = \frac{\pi^2 f^2 B_M^2 s^2}{8 \rho}$$



# TRASFORMATORE A INDUZIONE

nucleo a lamierini per piccolo trasformatore – correnti parassite



$$p_{cp} = \frac{\pi^2 f^2 B_M^2 s^2}{8 \rho}$$

+

$$p_{ist} = \eta f B_M^{1,6-2}$$

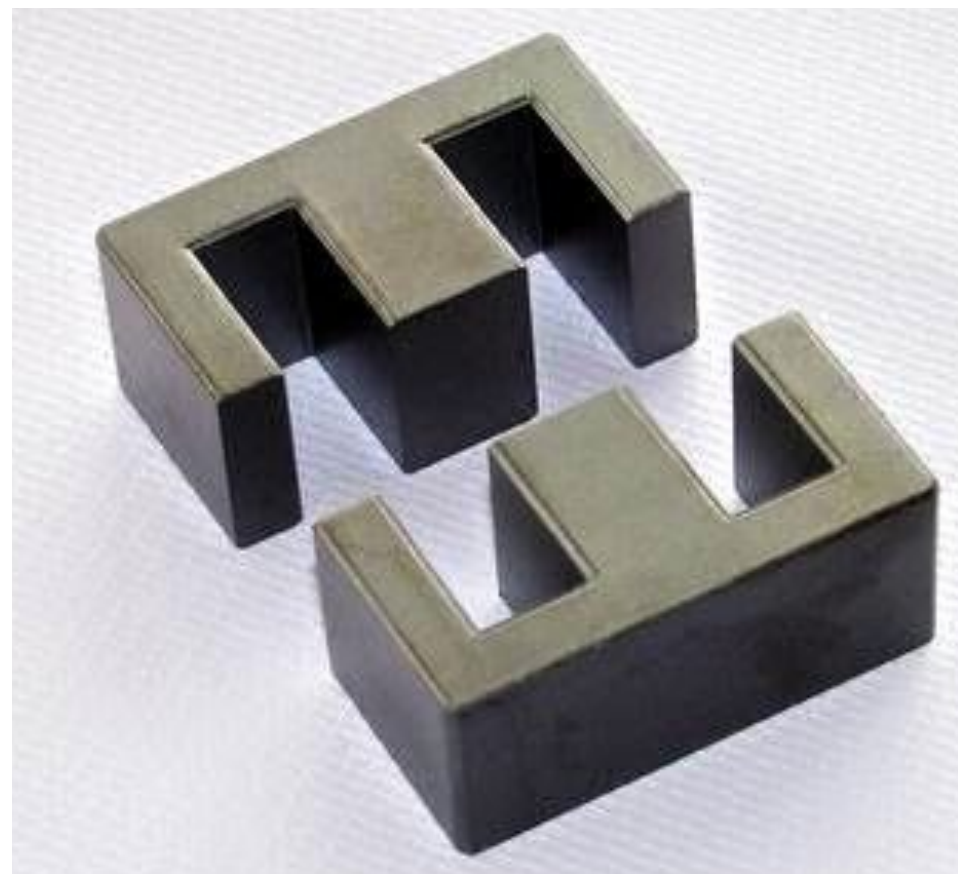
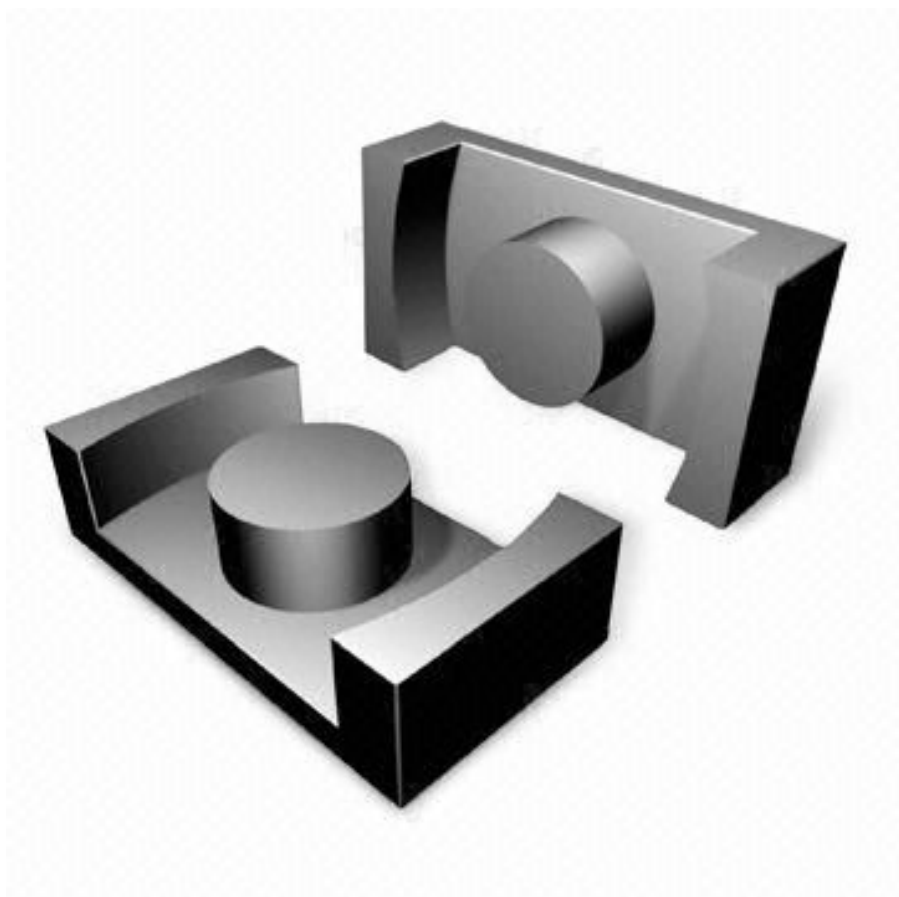
=

$$p_t = \eta f B_M^{1,6-2} + \beta f^2 B_M^2 s^2$$



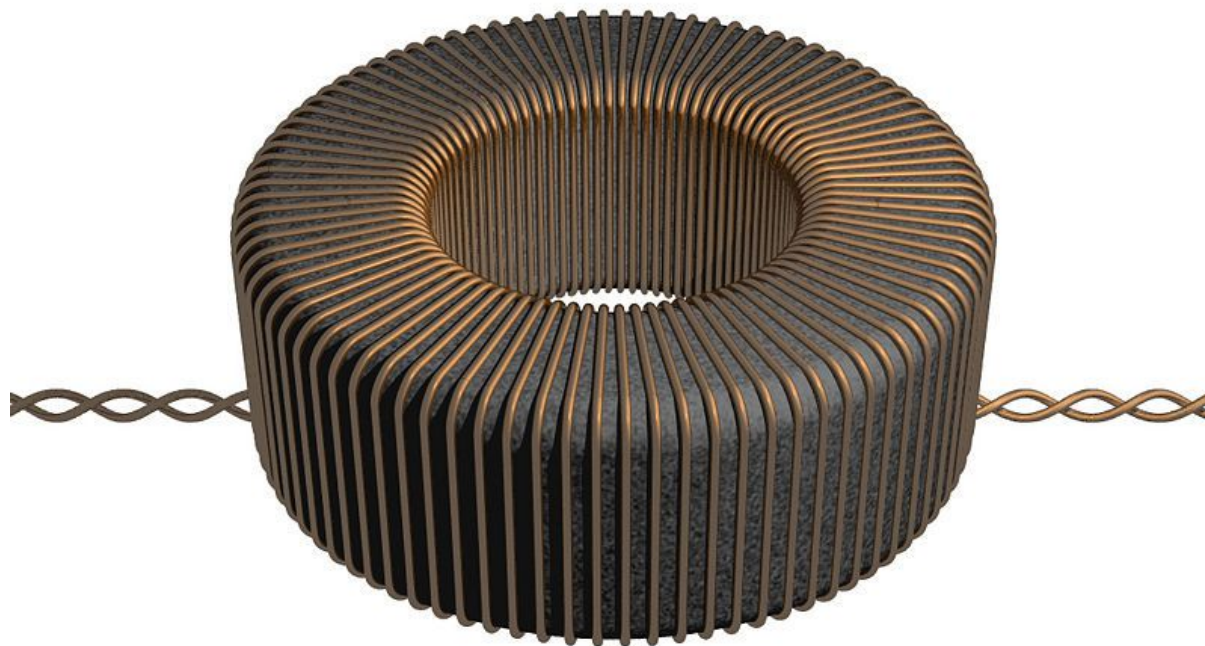
# TRASFORMATORE A INDUZIONE

nuclei in ferrite per piccoli trasformatori



# TRASFORMATORE A INDUZIONE

trasformatore toroidale (audio)



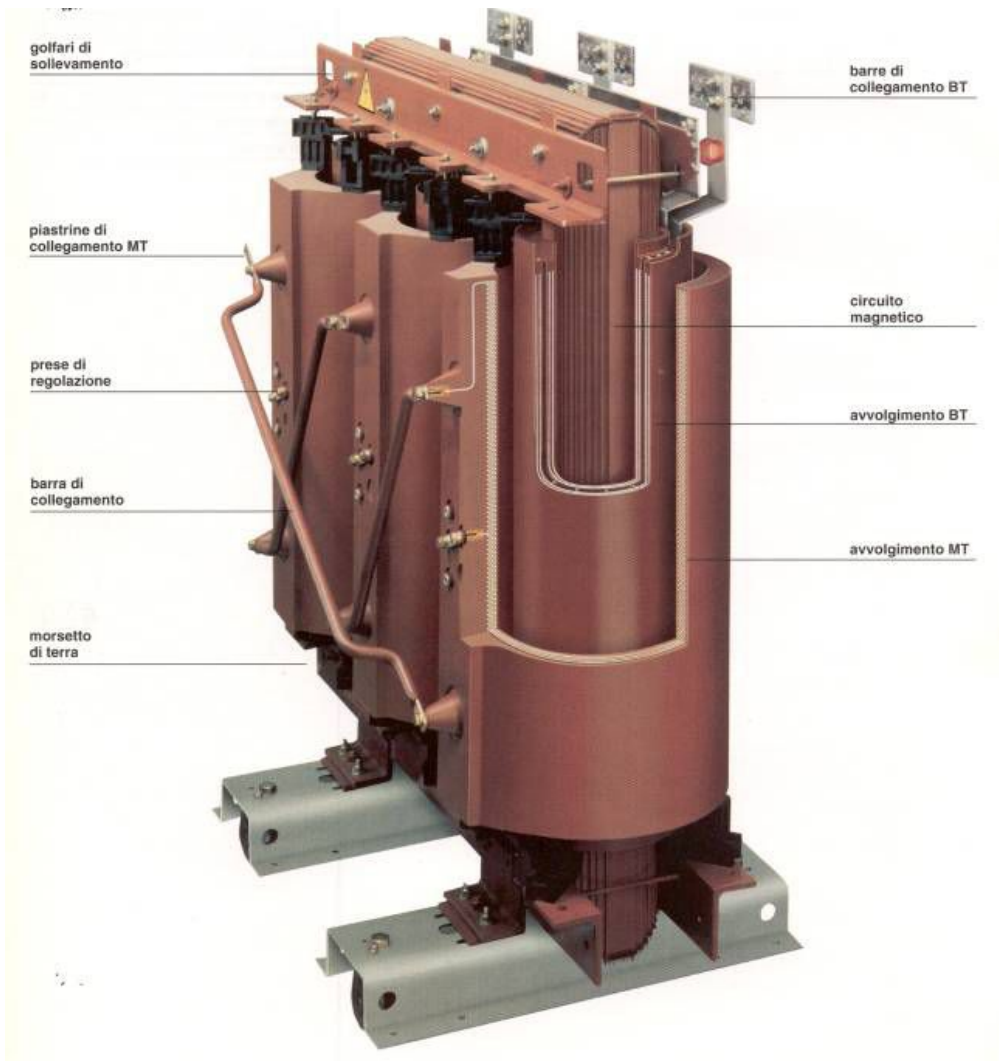
# TRASFORMATORE A INDUZIONE

piccoli trasformatori



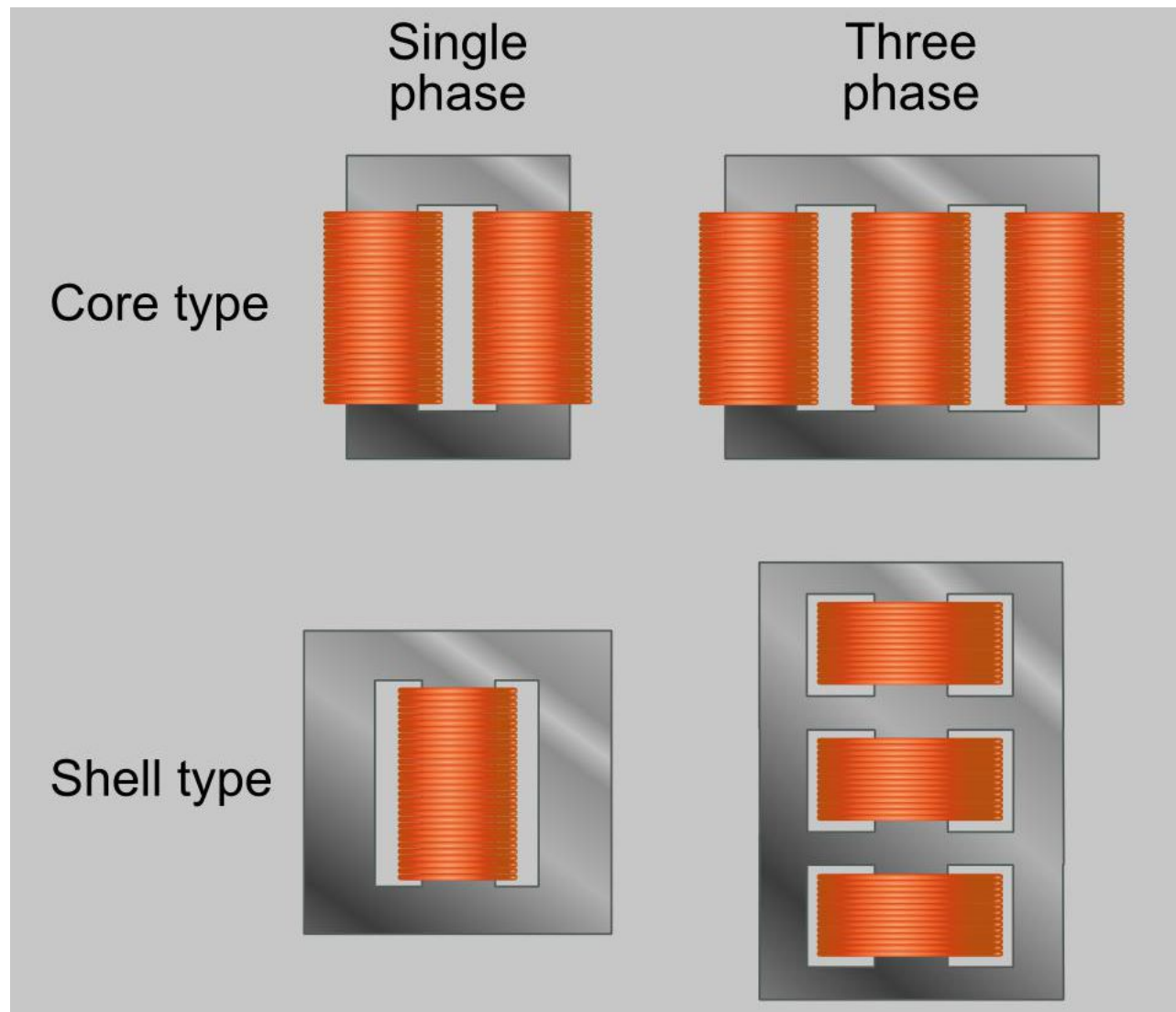
# TRASFORMATORE A INDUZIONE

nucleo per trasformatore trifase



# TRASFORMATORE A INDUZIONE

nucleo per trasformatore trifase



# TRASFORMATORE A INDUZIONE

trasformatore trifase aperto



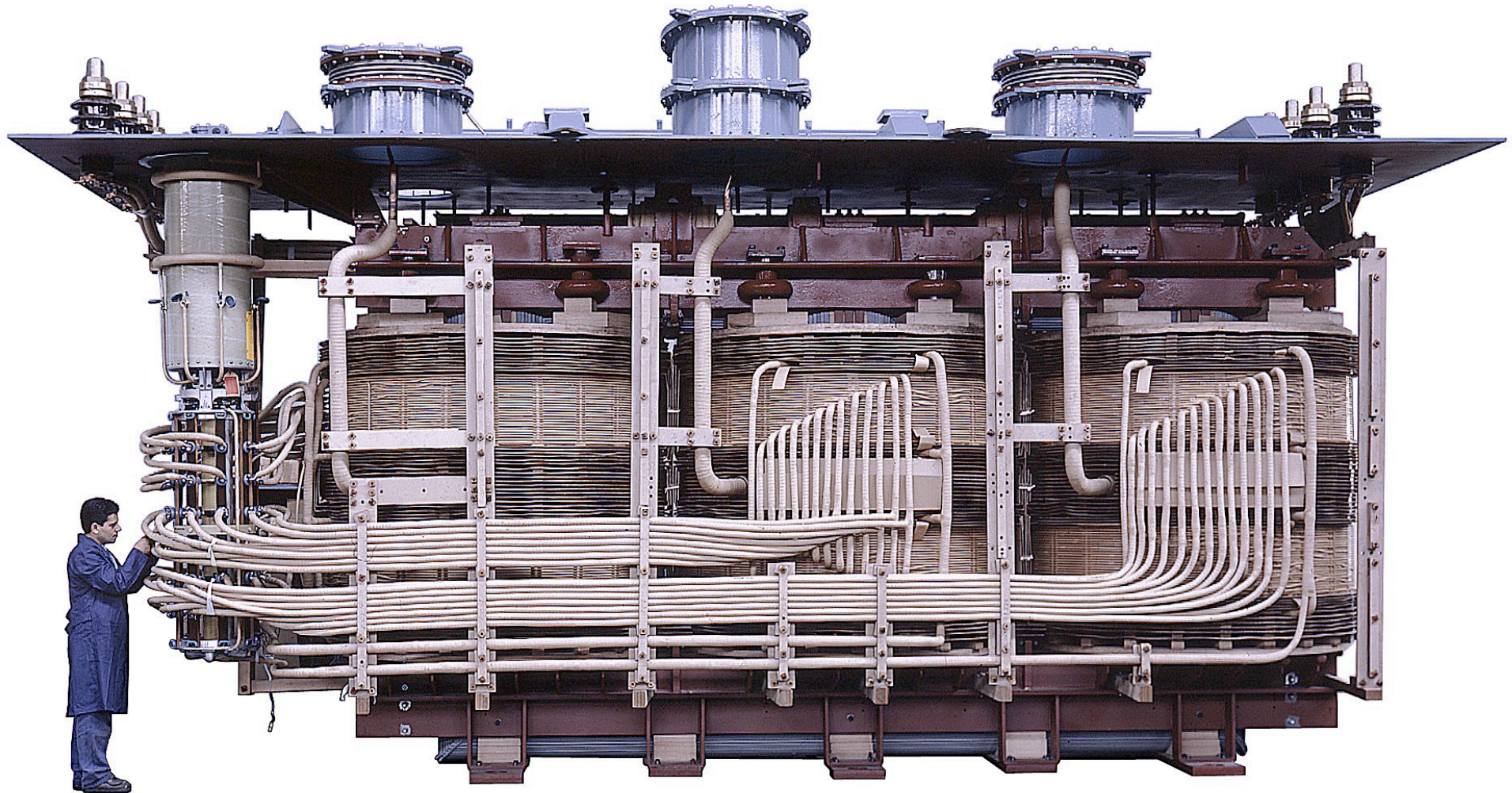
# TRASFORMATORE A INDUZIONE

fasi di costruzione



# TRASFORMATORE A INDUZIONE

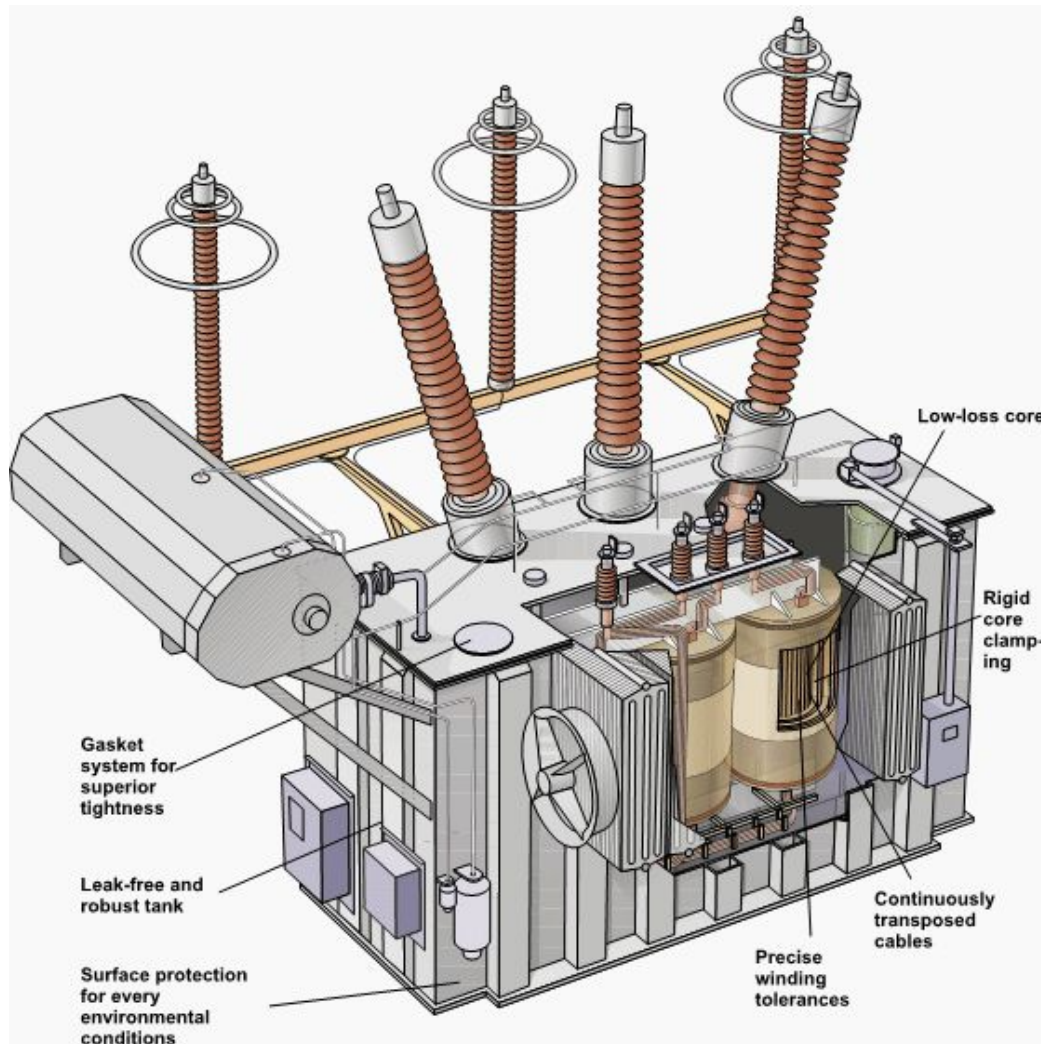
fasi di costruzione





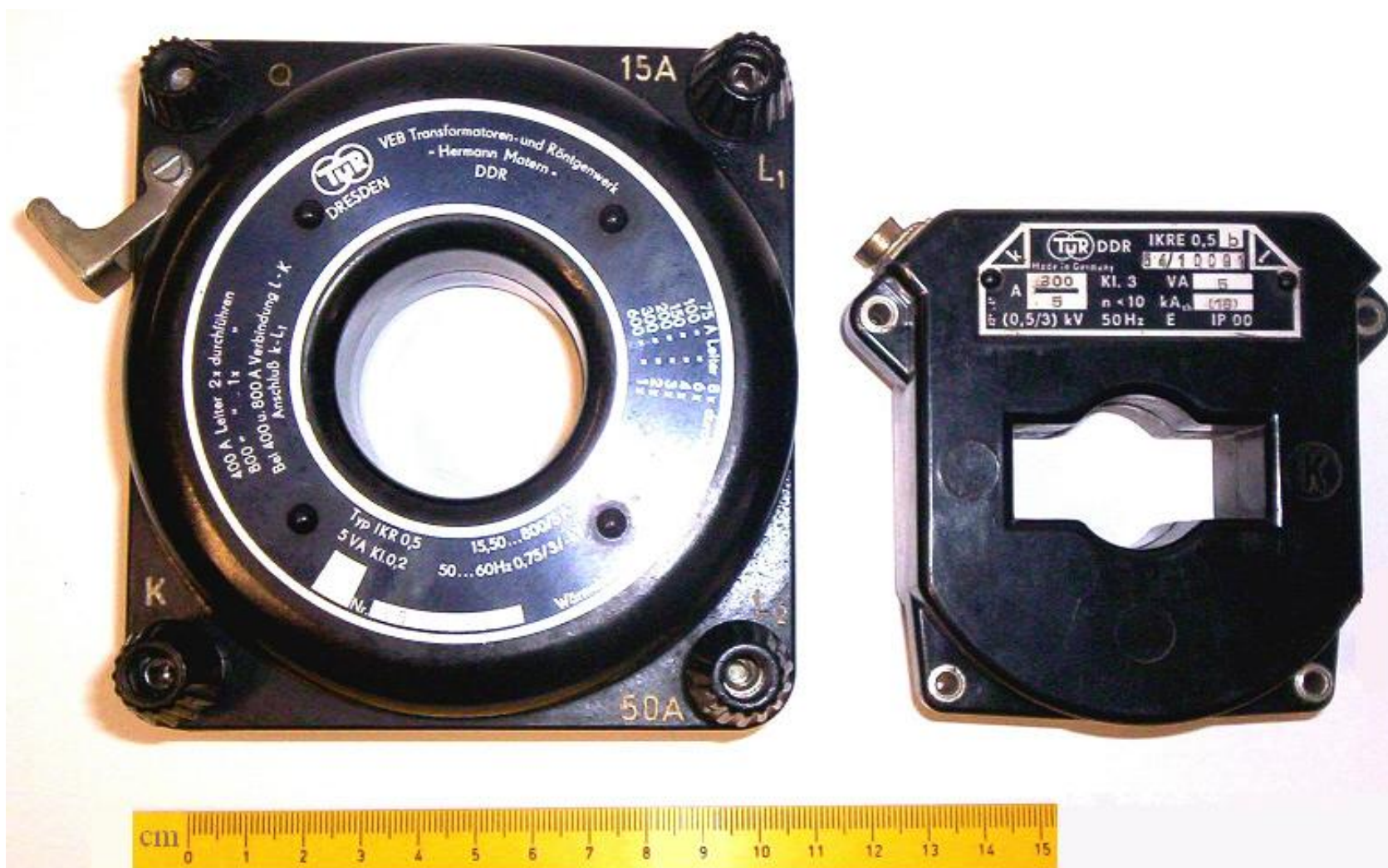
# TRASFORMATORE A INDUZIONE

trasformatore trifase sezionato



# TRASFORMATORE DI CORRENTE

per misure di corrente



# TRASFORMATORI PER SALE PROVE 800 kV



# TRASFORMATORI DA LAB. A TENSIONE SECONDARIA VARIABILE

