

# Characterization of Materials by Non-Destructive Methods

## Magnetic properties

### Permanent magnets: Alnico - Ferrite - SmCo - NdFeB



Standard measures:

- B-H Hysteresis Loop with  $H_cJ$  /  $H_cB$  /  $Br$  /  $BH$  max /  $B$  surface magnetic mapping (homogeneity) / vector and magnet angle**

Special measurements of these quantities / quality control:

- At High temperature: from 50 ° C to 250 ° C
- After corrosion according to the NF ISO 9227 test standard
- After mechanical wear / vibration / endurance tests

IEC  
60404 - 5,  
ASTM  
A977/A977M  
Standards

### Ferromagnetic steels: Fe - C and special alloys



Standard measures:

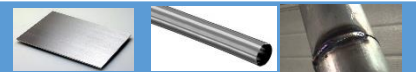
- B-H hysteresis loop with  $H_c$  /  $Br$  /  $\mu_r$  /  $\mu = f(H)$  measurements**

Special measures of these sizes:

- At Low and High temperatures: from -25 ° C to + 1100 ° C
- Under stress (traction, other), after heat treatment, mechanical
- Depending on the frequency of DC to 500 kHz

IEC 60404-4,  
ASTM A773 ,  
NF EN 10330  
Standards

### Stainless steels:



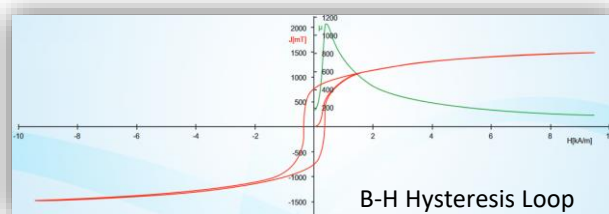
Standard measures:

- Relative magnetic permeability  $\mu_r$  /  $H_c$  /  $\mu_r$  mapping of finished part**
- Evaluation of para or ferromagnetic behavior, material quality**

Special measures: After thermal-mechanical treatment, welding, ferrite content

IEC 60404-  
15, ASTM  
A342  
Standards

B-H measuring bench



Magnetic saturation system