

# PERMENORM 5000 H2

## solid material

### COMPOSITION (in wt%)

47,5 Ni – bal. Fe  
IEC 60404-8-6 E31  
DIN 17405 (1979) RNi8 / RNi12

### PRODUCT DESCRIPTION

PERMENORM® 5000 H2 is a soft magnetic standard Ni-Fe alloys with about 50 % Ni content, combining both a high saturation induction and high maximum permeabilities. Machined into complex shapes PERMENORM 5000 H2 develops its signifying magnetic properties after final high temperature annealing in protective atmosphere.

### MAIN PROPERTIES

- Saturation induction  $J_s = 1.55$  T
- Coercivity  $H_C \approx 5$  A/m
- Max. permeability  $\mu_{max} \approx 75,000$



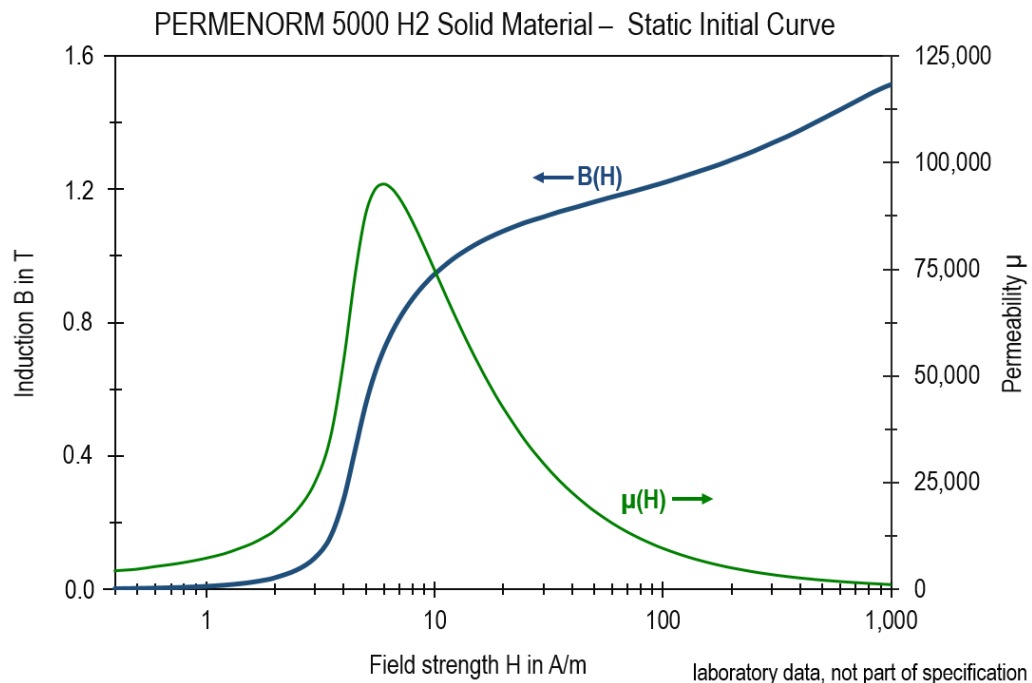
### TYPICAL APPLICATIONS

Magnetic lenses/charged particle guiding, positioning sensors, magnetic flux guiding, magnetic actuators

### FORMS OF SUPPLY

- Solid rods, diameters 12.5 – 182 mm
- Wire material, diameters  $\leq 13.5$  mm

Other diameters, square profile material and tolerances upon request. For strip material, see brochure PERMENORM 5000 H2 / V5 strip material.



## SOLID MATERIAL – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density $\rho$	g/cm <sup>3</sup>	8.25
Thermal conductivity (25 °C) $\lambda$	W/(m·K)	18 – 21
Thermal expansion coefficient (20 – 100 °C) $\alpha$	10 <sup>-6</sup> /K	10
Electrical resistivity $\rho_e$	$\mu\Omega\text{m}$	0.45

### STATIC MAGNETIC PROPERTIES

Coercivity $H_C$	A/m	5
Saturation polarization $J_S$	T	1.55
Saturation magnetization $B_S$ at $H = 40$ kA/m	T	1.60
Maximum permeability $\mu_{\max}$		75,000
Magnetostriction constant $\lambda_S$	ppm	+25
Curie temperature $T_C$	°C	440

### MECHANICAL PROPERTIES (finally heat treated)

Young's modulus $E$	GPa	140
Yield strength $R_{p0.2}$	MPa	160
Tensile strength $R_m$	MPa	470
Elongation $A$	%	40
Hardness	HV	100

### MECHANICAL PROPERTIES (hot rolled)

Yield strength $R_{p0.2}$	MPa	250
Tensile strength $R_m$	MPa	500
Elongation $A$	%	40
Hardness	HV	150

### RECOMMENDED PARAMETERS FOR HEAT TREATMENT

Atmosphere		hydrogen
Temperature	°C	1,150
Annealing time	h	5
Cooling rate	K/h	100 – 300