

VACOPERM 100

strip material

COMPOSITION (in wt%)

77 Ni – 4.5 Cu – 4 Mo – bal. Fe
IEC 60404-8-6 E11
DIN 17405 (1979) RNi2 / RNi5

PRODUCT DESCRIPTION

VACOPERM® 100 is an 80 % NiFe with very high maximum magnetic permeability and low coercivity, used for many different kinds of application ranging from magnetic shielding to current and positioning sensors.

Through an optional tempering after heat treatment it is possible to adjust the material to a state with extraordinary high initial permeabilities.

VACOPERM 100 and MUMETALL® are closely related, however, due to its modified composition the tempering for optimizing the initial permeability of VACOPERM 100 is simplified as the necessary temperatures are lower. This comes in hand with a slightly lower saturation induction of the alloy.

MAIN PROPERTIES

- Saturation induction $J_S = 0.74$ T
- Low coercivity $H_C = 0.6$ A/m
- High initial permeability after tempering $\mu_{0.1 \text{ A/m}} = 90,000$

TYPICAL APPLICATIONS

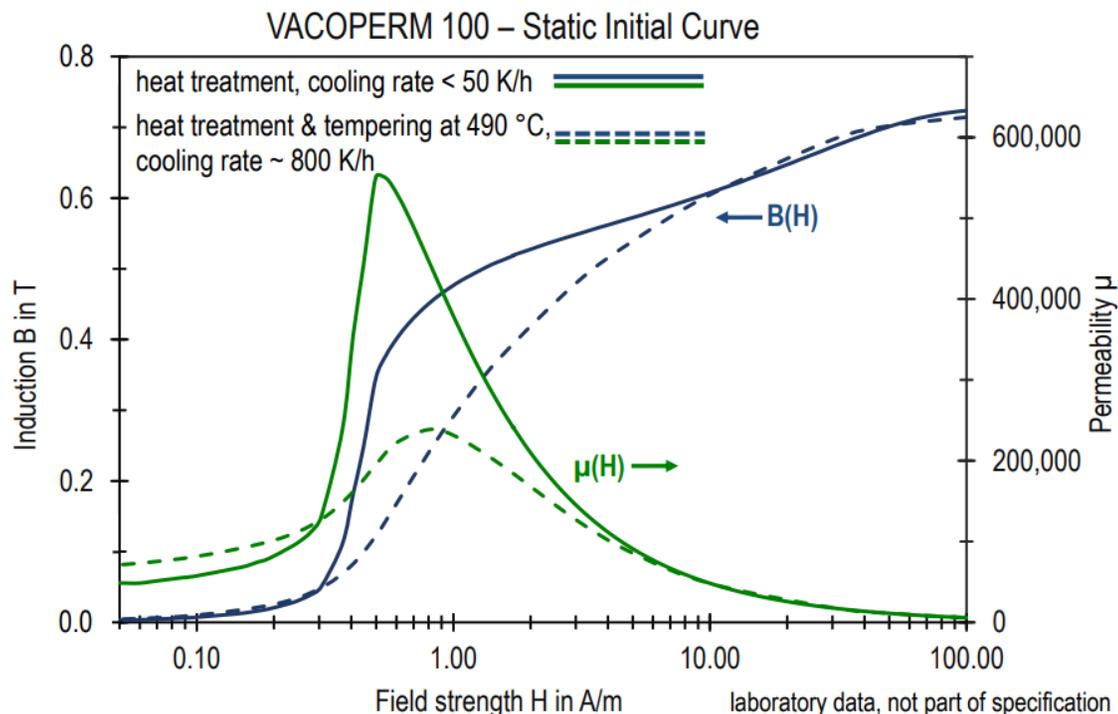
Magnetic shielding, high sensitivity current sensors, relay parts for residual current devices, transformer cores.

FORMS OF SUPPLY

- Strip material, thickness 0.025 – 2 mm, width ≤ 305 mm
- Stamped parts, laminations, and laminated assemblies

Other dimensions and tolerances upon request.

For solid material and wire, see data sheet VACOPERM 100 D.



STRIP MATERIAL 0.35 mm – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density ρ	g/cm ³	8.7
Thermal conductivity (25 °C) λ	W/(m·K)	18 – 20
Thermal expansion coefficient (20 – 100 °C) α	10 ⁻⁶ /K	13.5
Electrical resistivity ρ_e	$\mu\Omega\text{m}$	0.6

STATIC MAGNETIC PROPERTIES		After heat treatment with cooling rate 50 K/h	After heat treatment & tempering with recommended conditions
Coercivity H_C	A/m	0.6	
Saturation polarization J_S	T	0.74	
Saturation magnetization B_S at $H = 40$ kA/m	T	0.79	
Maximum permeability μ_{\max}		350,000	240,000
Initial permeability $\mu_{0.1\text{ A/m}}$		70,000	90,000
Magnetostriction constant λ_S	ppm	~ 1	
Curie temperature T_C	°C	360	

MECHANICAL PROPERTIES (after recommended Heat treatment)		
Young's modulus E	GPa	190
Yield strength $R_{p0.2}$	MPa	150
Hardness	HV	105

MECHANICAL PROPERTIES (delivery state)		cold rolled	soft annealed
Yield strength $R_{p0.2}$	MPa	1,250	290
Tensile strength R_m	MPa	1,290	660
Elongation A	%	1	30
Hardness	HV	350	150

RECOMMENDED PARAMETERS FOR HEAT TREATMENT		
Atmosphere		hydrogen
Temperature	°C	1,150
Annealing time	h	5
Cooling rate	K/h	50 – 300

RECOMMENDED PARAMETERS FOR OPTIONAL TEMPERING AFTER HEAT TREATMENT		
Atmosphere		hydrogen
Tempering temperature	°C	490
Tempering cooling rate	K/h	≥ 800

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