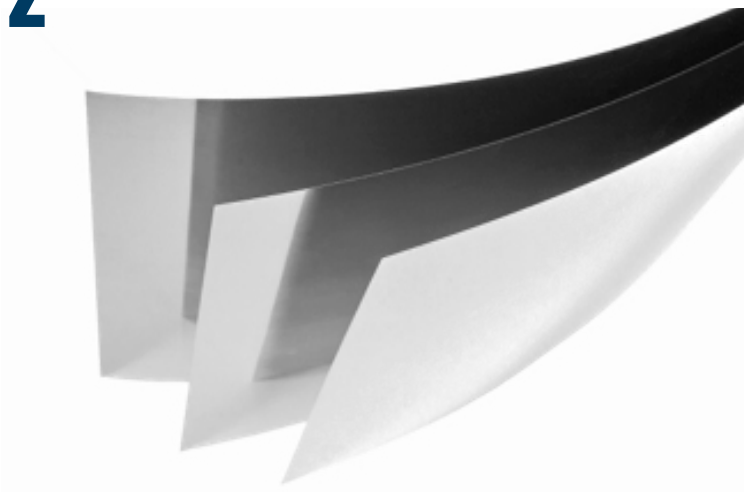
PERMENORM 5000 Z

Strip material



COMPOSITION (in wt%)

47.5 Ni – bal. Fe

PRODUCT DESCRIPTION

PERMENORM® 5000 Z is a tailored variant of the PERMENORM 5000 NiFe alloy family characterized by a high remanence magnetization featuring a distinct rectangular- or square-shaped hysteresis loop after a specific final heat treatment.

The parameters of the final heat treatment are often application-specific and must be carefully adjusted depending on the desired properties.

TYPICAL APPLICATIONS

Laminated cores, wound cores

MAIN PROPERTIES

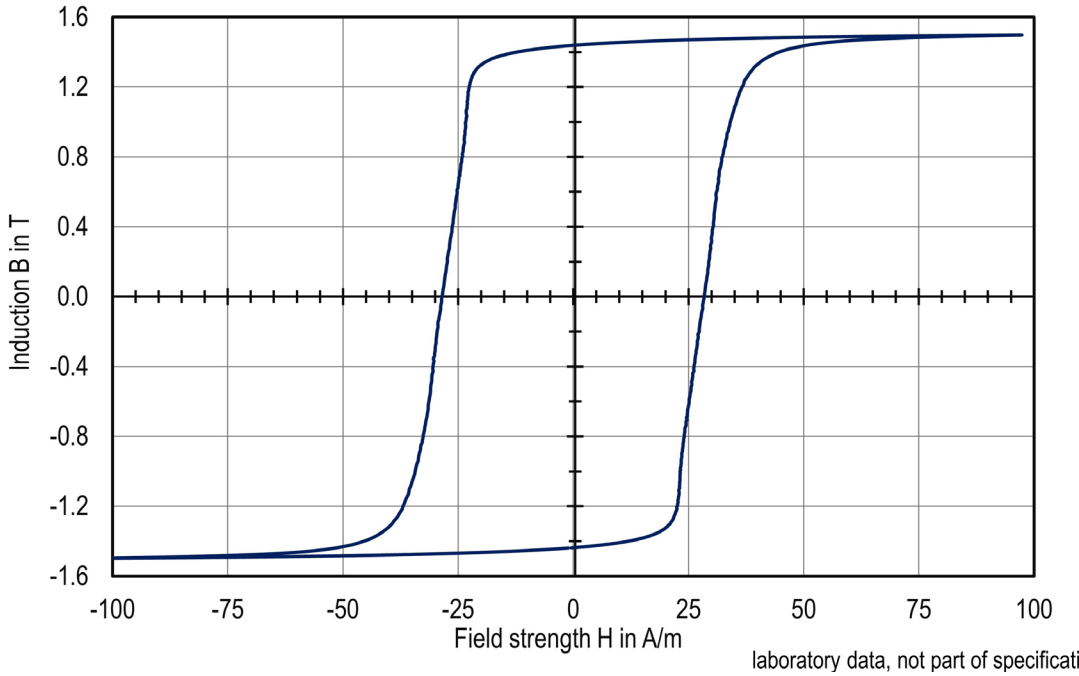
Square hysteresis loop with high ratio of remanence to peak magnetization of typically $B_R / B_1 \geq 0.95$ for wound cores.

FORMS OF SUPPLY

- Strip material, thickness 0.025 – 0.1 mm, width ≤ 290 mm

Other dimensions and tolerances upon request.

PERMENORM 5000 Z - Hysteresis Loop - 0.1 mm wound core, f = 50 Hz



laboratory data, not part of specification

STRIP MATERIAL 0.1 mm - TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density ρ	g/cm³	8.25
Thermal conductivity (25 °C) λ	W/(m·K)	18 – 20
Thermal expansion coefficient (20 – 100 °C) α	10^{-6}/K	10
Electrical resistivity ρ_e	μΩm	0.45

MAGNETIC PROPERTIES		
Saturation polarization J_S	T	1.55
Peak magnetization B_1 for f = 50 Hz and $\hat{H}$ = 1 A/m	T	1.50*
Ratio remanence to peak magnetization B_R / B_1		0.95*
Magnetostriction constant λ_S	ppm	+ 25
Curie temperature T_C	°C	440

*for strip wound cores

MECHANICAL PROPERTIES (after final heat treatment)		
Young's modulus E	GPa	140
Yield strength $R_{p0.2}$	MPa	180
Hardness	HV	110

MECHANICAL PROPERTIES (cold rolled)		
Yield strength $R_{p0.2}$	MPa	975
Tensile strength R_m	MPa	1,000
Elongation A	%	1
Hardness	HV	280

RECOMMENDED PARAMETERS FOR THE FINAL HEAT TREATMENT		
Atmosphere		Hydrogen
Temperature	°C	850 – 1,050
Annealing time	h	2 – 4

Published by VACUUMSCHMELZE GmbH & Co. KG, Hanau, May 2026