VITROPERM® VP 800 / 500

NOMINAL ALLOY COMPOSITION

Alloy	Fe	Ni	Co	Cu	Nb	Si	B	
VP 800	Balance (82.8)	–	–	1.3	5.6	8.8	1.5	(wt-%)
	73.6	–	–	1.0	3.0	15.5	6.9	(at.-%)

MAGNETIC PROPERTIES[1]

Property	Value	Unit
Saturation polarization (as cast / amorphous @ 20 °C)	1.21	T
Saturation polarization (nanocrystalline @ 20 °C)	1.24	T
Saturation magnetostriction (as cast / amorphous)	25	ppm
Saturation magnetostriction (nanocrystalline)	$\lvert\lambda_s\rvert < 0.5$	ppm
Permeability (VP 800 F / transverse field annealing)	20,000 – 200,000	(μ_{max} @ 50 Hz)
Permeability (VP 800 R / annealing without magn. field)	≤ 600,000	(μ_{max} @ 50 Hz)
DC coercivity (VP 800 F / transverse field annealing)	0.5	A/m
DC coercivity (VP 800 R / annealing without magn. field)	1	A/m
Magnetic power loss (VP 800 F @ 100 kHz, 0.3 T)	≤ 80	W/kg
Magnetic power loss (VP 800 R @ 50 Hz, 1.0 T)	0.03	W/kg
Curie temperature	600	°C

PHYSICAL PROPERTIES[1]

Property	Value	Unit
Mass density (as cast / amorphous)	7.17	g/cm³
Mass density (nanocrystalline)	7.35	g/cm³
Electrical resistivity (nanocrystalline)	1.15	µΩm
Coefficient of thermal expansion (20 - 100 °C, as cast)	8	10^{-6}/K
Crystallization temperature (as cast / amorphous)	510	°C

AVAILABLE DIMENSIONS[2]

Property	Value	Unit
Thickness (computed average thickness from weight)	16 ± 2 / 18 ± 3	µm
Widths – slit to width	2.0 … 60.0 ± 0.15	mm
Widths – width as cast	25.0 … 58.0 ± 0.5 60.0 … 66.0 ± 1.0	mm

[1] Typical values, not part of a specification

[2] Nominal thickness of 16 µm not available in any width; other thicknesses and widths on request

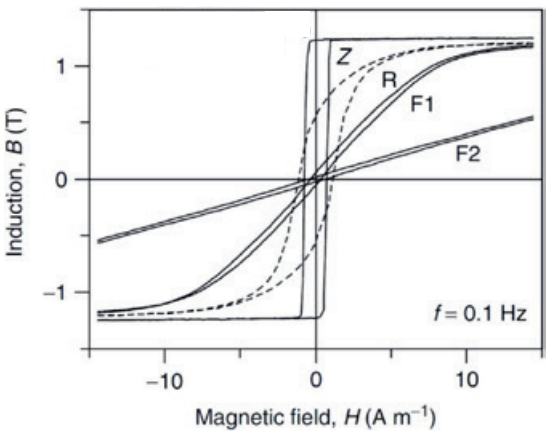

Figure 1: Typical quasistatic hysteresis loops (adjustable by annealing, e.g. 1 h @ 540 °C)[3]

Z – with parallel magnetic field

R – without magnetic field

F1 – with transverse magnetic field ($K_u \approx 6$ Jm^{-3}, $\mu \approx 100.000$)

F2 – with transverse magnetic field ($K_u \approx 20$ Jm^{-3}, $\mu \approx 30.000$)

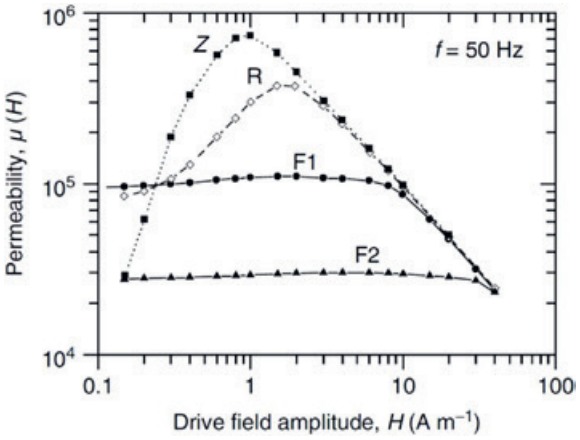

Figure 2: Permeability @ 50 Hz for materials shown in fig. 1.

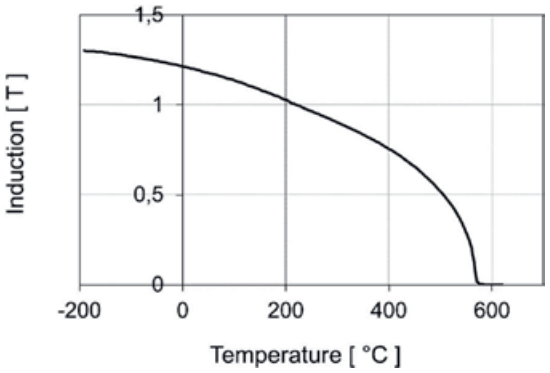

Figure 3: Temperature dependence of saturation induction. Service temperature should not exceed 120 °C - 180 °C. The precise upper limit for service temperature depends on time, magnetic quality, magnetization condition during operation, and the accepted changes. Please contact VAC for further information.

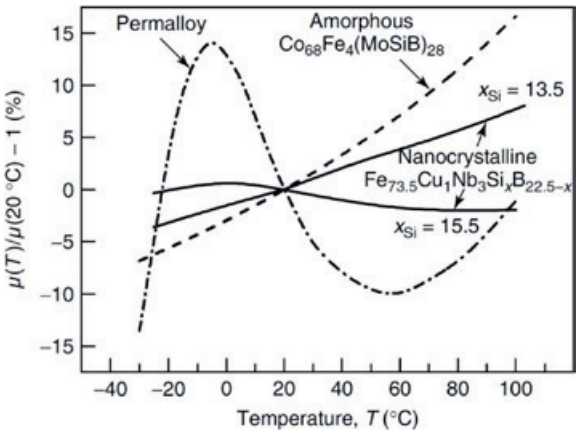

Figure 4: Temperature dependence of typical permeabilities. Relative change of the initial permeability normalized to its room-temperature value versus the typical range of application temperatures for highly permeable soft magnetic materials. All examples have been transverse field annealed and reveal an initial permeability in the range of 70,000 - 90,000.

[3] G. Herzer, Nanocrystalline soft magnetic alloys. In: K.H.J. Buschow, editor. Handbook of magnetic materials, vol. 10, Elsevier Science B.V. (1997) p.415

Published by VACUUMSCHMELZE GmbH & Co. KG, Hanau

Version: June 2019