MEGAPERM 40 L

COMPOSITION (in wt%)
40.5 Ni – bal. Fe

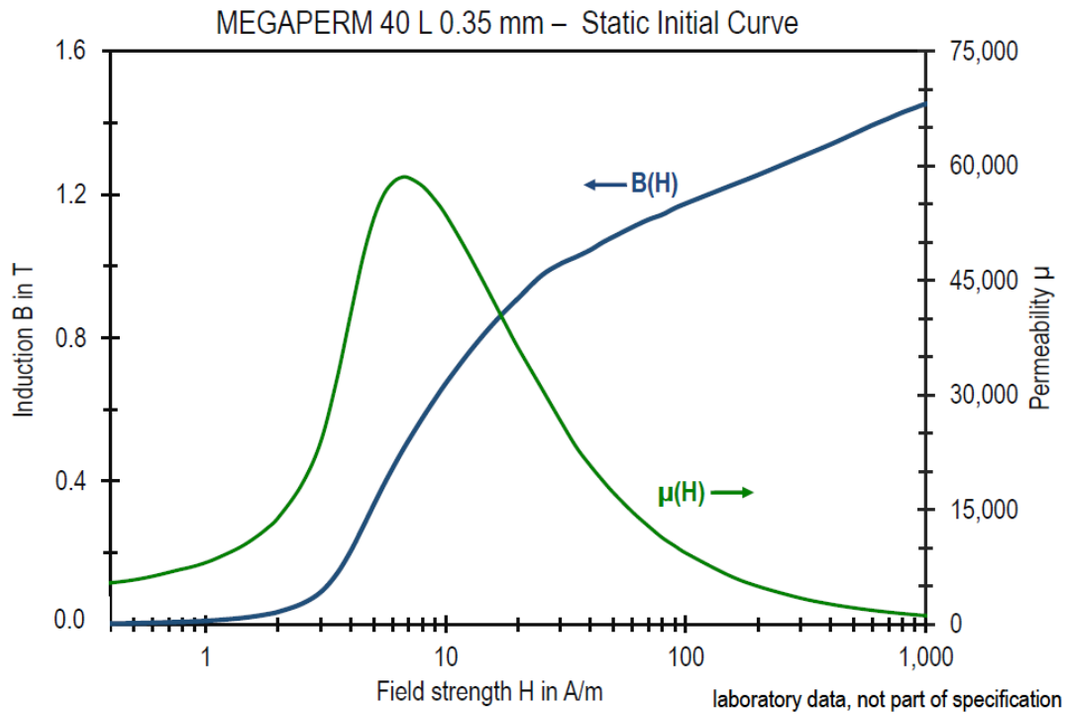
PRODUCT DESCRIPTION
MEGAPERM® 40 L is a NiFe alloy with both high magnetic saturation and high electrical resistivity. It is usually supplied with an isotropic fine-grained microstructure after final annealing and is particularly suitable for low loss high frequency motor applications and fast switching relay or magnetic valve applications.

TYPICAL APPLICATIONS
laminated stacks for high speed motors, relay and flux guiding parts

MAIN PROPERTIES
- Saturation induction J_S = 1.48 T
- Low specific iron losses
- Electrical resistivity ρ_e = 0.6 µΩm

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.



STRIP MATERIAL 0.35 mm – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density ρ	g/cm³	8.2
Thermal conductivity (25 °C) λ	W/(m·K)	16 – 18
Thermal expansion coefficient (20 – 100 °C) α	10^{-6}/K	4
Electrical resistivity ρ_e	µΩm	0.6

STATIC MAGNETIC PROPERTIES		
Coercivity H_C	A/m	6
Saturation polarization J_S	T	1.48
Saturation magnetization B_S at H = 40 kA/m	T	1.53
Maximum permeability μ_{max}		65,000
Magnetostriction constant λ_S	ppm	+ 25
Curie temperature T_C	°C	330

SPECIFIC IRON LOSSES OF STRIP MATERIAL AFTER FINAL HEAT TREATMENT		strip thickness		
		0.10 mm	0.20 mm	0.35 mm
p_{Fe} 1.0 T 50 Hz	W/kg	0.17	0.20	0.27
p_{Fe} 1.0 T 400 Hz	W/kg	2.4	4.2	8.9
p_{Fe} 1.0 T 1,000 Hz	W/kg	9.2	20	50
p_{Fe} 1.2 T 50 Hz	W/kg	0.26	0.31	0.42
p_{Fe} 1.2 T 400 Hz	W/kg	3.6	6.3	15
p_{Fe} 1.2 T 1,000 Hz	W/kg	14	31	85

MECHANICAL PROPERTIES (finally heat treated 5 h 1,150 °C)		
Young's modulus E	GPa	120
Yield strength $R_{p0.2}$	MPa	190
Hardness	HV	120

MECHANICAL PROPERTIES (delivery state)		cold rolled	soft annealed
Yield strength $R_{p0.2}$	MPa	830	260
Tensile strength R_m	MPa	860	480
Elongation A	%	< 1	> 30
Hardness	HV	250	130

RECOMMENDED PARAMETERS FOR THE FINAL HEAT TREATMENT		
Atmosphere		hydrogen
Temperature	°C	1,050 – 1,150
Annealing time	h	5
Cooling rate	K/h	100 – 300

Published by VACUUMSCHMELZE GmbH & Co. KG, Hanau, March 2024