

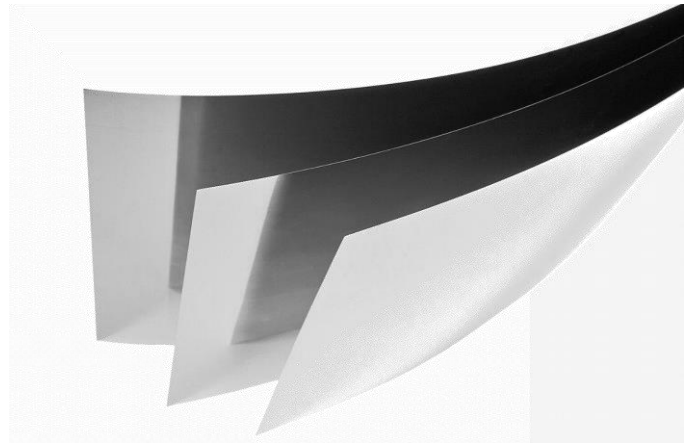
# MEGAPERM 40 L

## 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

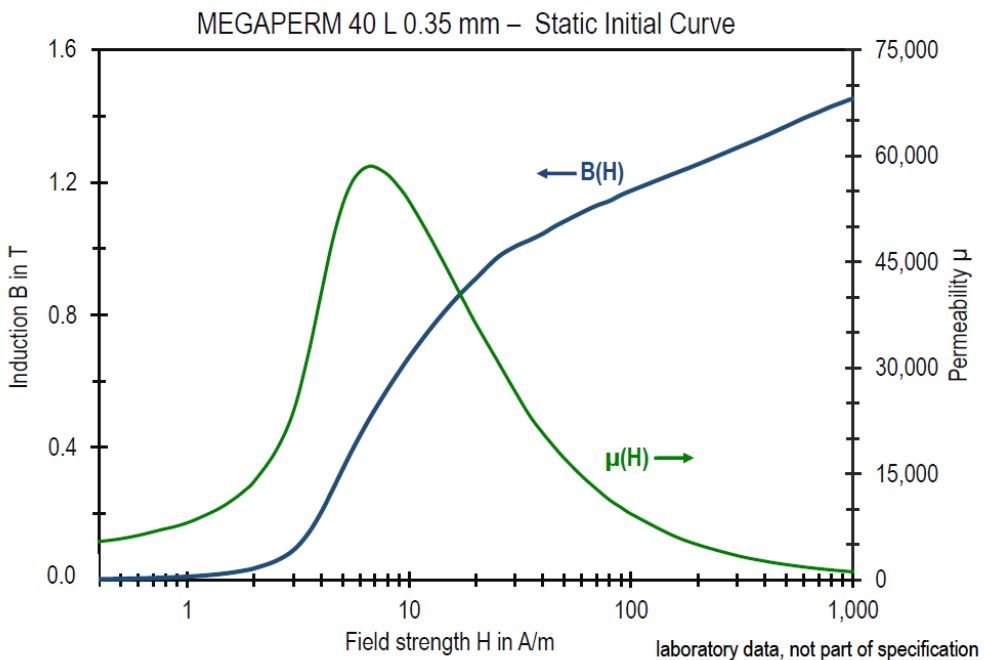
## MAIN PROPERTIES

- Saturation induction  $J_S = 1.48$  T
- Low specific iron losses
- Electrical resistivity  $\rho_e = 0.6 \mu\Omega\text{m}$

## FORMS OF SUPPLY

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

Other dimensions and tolerances upon request.



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## STRIP MATERIAL 0.35 mm – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density $\rho$	g/cm <sup>3</sup>	8.2
Thermal conductivity (25 °C) $\lambda$	W/(m·K)	16 – 18
Thermal expansion coefficient (20 – 100 °C) $\alpha$	10 <sup>-6</sup> /K	4
Electrical resistivity $\rho_e$	$\mu\Omega$ m	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 $\mu_{max}$		65,000
Magnetostriction constant $\lambda_s$	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

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