

# MUMETALL

## solid material

### COMPOSITION (in wt%)

77 Ni – 4.5 Cu – 3.3 Mo – bal. Fe  
IEC 60404-8-6 E11  
DIN 17405 (1979) RNi2 / RNi5

### PRODUCT DESCRIPTION

As one of the most prominent 80% NiFe alloys, MUMETALL® stands for an exceptionally high maximum magnetic permeability paired with a very low coercivity, making it the standard material for many different kinds of application.



### TYPICAL APPLICATIONS

High sensitivity current sensors, magnetic lenses/charged particle guiding, magnetic shielding

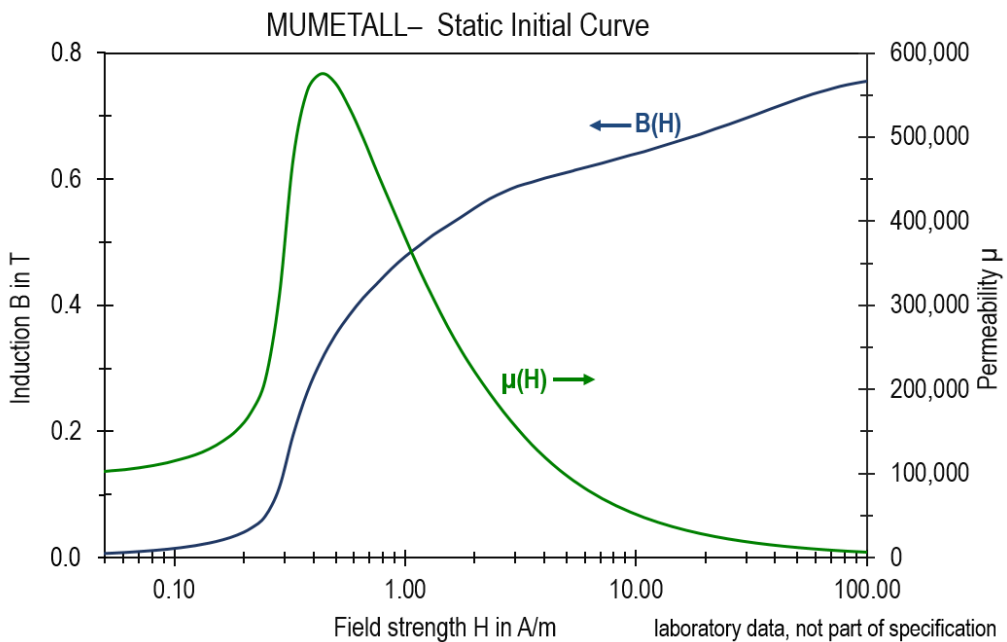
### MAIN PROPERTIES

- Saturation polarization  $J_s = 0.78$  T
- Maximum permeability  $\mu_{max} = 500,000$
- Low coercivity  $H_c = 0.6$  A/m

### FORMS OF SUPPLY

- Solid rods, diameters 12.5 – 182 mm
- Wire material, diameters  $\leq 13.5$  mm

Other diameters, square profile material and tolerances upon request.  
For strip material, see data sheet MUMETALL strip material.



## SOLID MATERIAL – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density $\rho$	g/cm <sup>3</sup>	8.7
Thermal conductivity (25 °C) $\lambda$	W/(m·K)	18 – 20
Thermal expansion coefficient (20 – 100 °C) $\alpha$	10 <sup>-6</sup> /K	13.5
Electrical resistivity $\rho_e$	$\mu\Omega\text{m}$	0.6

STATIC MAGNETIC PROPERTIES		
Coercivity $H_C$	A/m	0.6
Saturation polarization $J_S$	T	0.78
Saturation magnetization $B_S$ at $H = 40$ kA/m	T	0.83
Maximum Permeability $\mu_{\max}$		500,000
Initial Permeability $\mu_{0.1\text{ A/m}}$		45,000
Magnetostriction constant $\lambda_S$	ppm	~ 1
Curie temperature $T_C$	°C	400

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

MECHANICAL PROPERTIES (hot rolled)		
Yield strength $R_{p0.2}$	MPa	300
Tensile strength $R_m$	MPa	650
Elongation $A$	%	> 30
Hardness	HV	160

RECOMMENDED PARAMETERS FOR HEAT TREATMENT		
Atmosphere		hydrogen
Temperature	°C	1,050 – 1,150
Annealing time	h	5
Cooling rate	K/h	50 – 300