ULTRAVAC 80 D

solid material

COMPOSITION (in wt%)
80 Ni – 5 Mo – bal. Fe
ASTM A 753 Alloy 4
IEC 60404-8-6 E11
DIN 17405 (1979) RNi2 / RNi5

PRODUCT DESCRIPTION

ULTRAVAC® 80 D can be seen as the copper-free variant of the high permeability 80 % NiFe alloy MUMETALL® with very similar technological properties and application profile. It exhibits very high maximum magnetic permeability paired with a very low coercivity.

Due to its composition ULTRAVAC 80 D complies with ASTM A 753 Alloy 4 and is particularly used in applications that demand copper-free components.

MAIN PROPERTIES

- Saturation polarization $J_S = 0.75$ T
- Maximum permeability $\mu_{max} = 400{,}000$
- Low coercivity $H_C = 0.6$ A/m

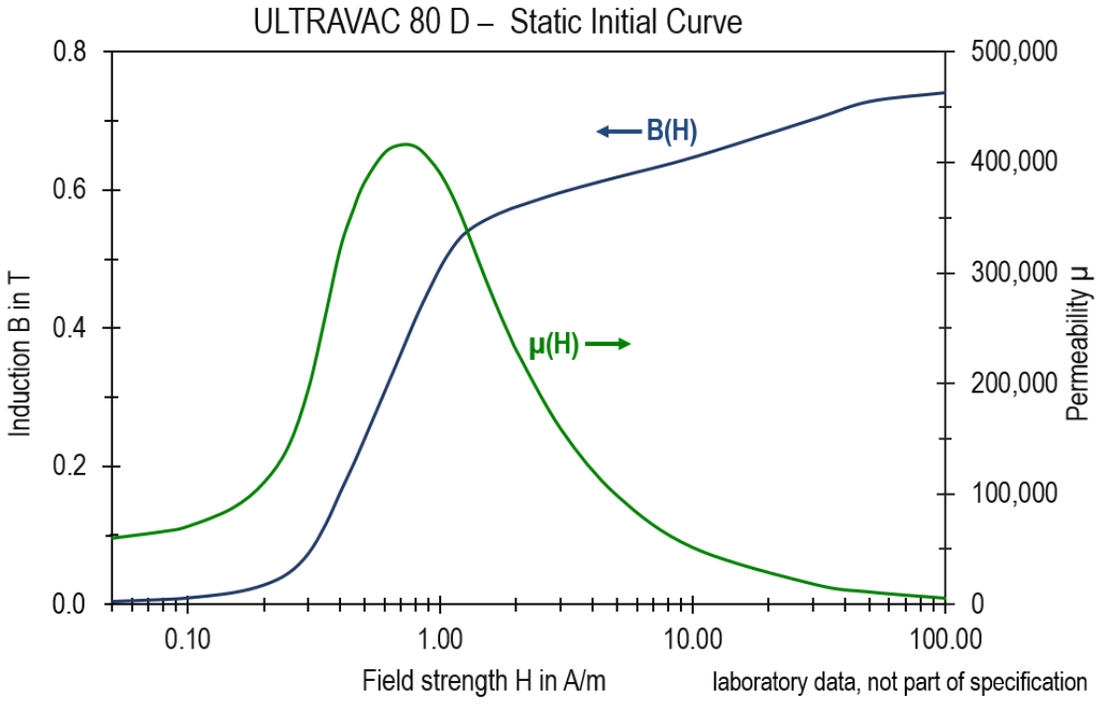
TYPICAL APPLICATIONS

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

FORMS OF SUPPLY

- Solid rods, diameters 12.5 – 182 mm
- Wire material, diameters ≤ 13.5 mm

Other diameters, square profile material and tolerances upon request. For strip material. see brochure ULTRAVAC 80 strip material



SOLID MATERIAL – TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density ρ	g/cm³	8.7
Thermal conductivity (25 °C) λ	W/(m·K)	18 – 20
Thermal expansion coefficient (20 – 100 °C) α	10^{-6}/K	13.5
Electrical resistivity ρ_e	µΩm	0.6

STATIC MAGNETIC PROPERTIES		
Coercivity H_C	A/m	0.6
Saturation polarization J_S	T	0.75
Saturation magnetization B_S at H = 40 kA/m	T	0.80
Maximum permeability μ_{max}		400,000
Initial Permeability $\mu_{0.1\ A/m}$		65,000
Magnetostriction constant λ_S	ppm	-1
Curie temperature T_C	°C	370

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 THE FINAL HEAT TREATMENT		
Atmosphere		hydrogen
Temperature	°C	1,150
Annealing time	h	5
Cooling rate	K/h	50 – 300

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