ULTRAVAC 44 V6

COMPOSITION (in wt%)
44 Ni – 3 Mo – bal. Fe

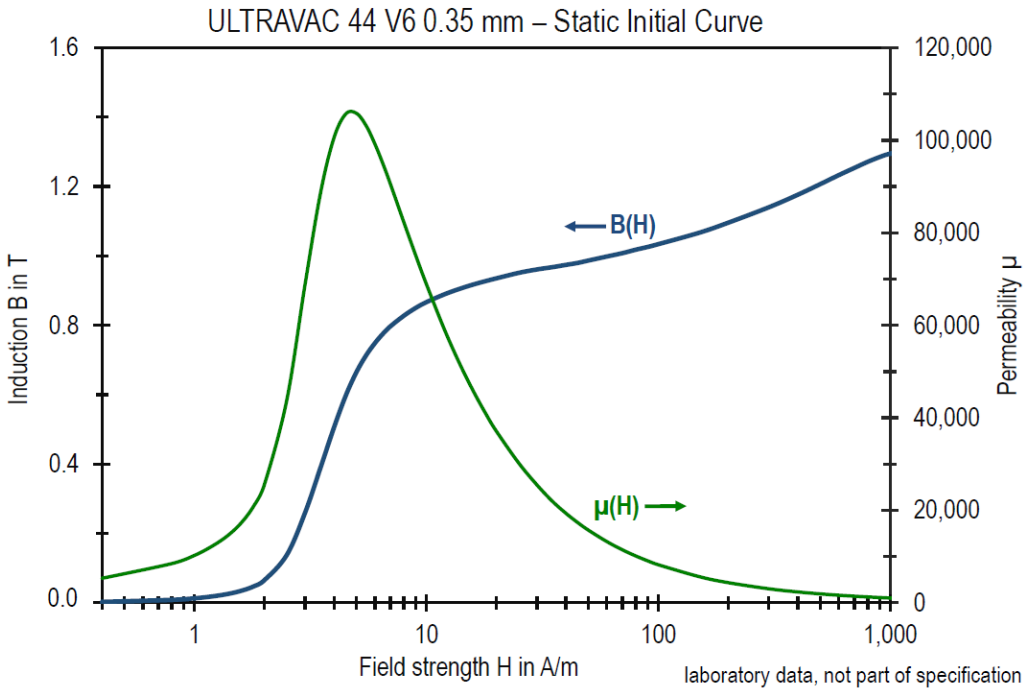
PRODUCT DESCRIPTION
ULTRAVAC® 44 V6 is a low loss NiFe alloy that has been designed to exhibit a specifically high electric resistivity with low hysteresis losses. Supplied with an isotropic fine-grained microstructure after final annealing ULTRAVAC 44 V6 is particularly used in highly efficient high frequency motor applications.

TYPICAL APPLICATIONS
laminated stacks for high speed motors, current and positioning sensors.

MAIN PROPERTIES
- Saturation induction J_S = 1.35 T
- Low specific iron losses
- Electrical resistivity ρ_e = 0.8 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	8.25
Thermal conductivity (25 °C) λ	W/(m·K)	13 – 15
Thermal expansion coefficient (20 – 100 °C) α	10^{-6}/K	7 – 8
Electrical resistivity ρ_e	µΩm	0.8

STATIC MAGNETIC PROPERTIES		
Coercivity H_C	A/m	2.5
Saturation polarization J_S	T	1.35
Saturation magnetization B_S at H = 40 kA/m	T	1.40
Maximum permeability μ_{max}		100,000
Magnetostriction constant λ_S	ppm	+ 25
Curie temperature T_C	°C	340

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	0.21	0.20	0.25
p_{Fe} 1.0 T 400 Hz	W/kg	2.6	3.8	8.1
p_{Fe} 1.0 T 1,000 Hz	W/kg	9.3	18	45
p_{Fe} 1.2 T 50 Hz	W/kg	0.30	0.30	0.39
p_{Fe} 1.2 T 400 Hz	W/kg	3.8	5.6	12
p_{Fe} 1.2 T 1,000 Hz	W/kg	14	28	69

MECHANICAL PROPERTIES (finally heat treated)		
Young's modulus E	GPa	140
Yield strength $R_{p0.2}$	MPa	160
Hardness	HV	100

MECHANICAL PROPERTIES (delivery state)		cold rolled	soft annealed
Yield strength $R_{p0.2}$	MPa	950	250
Tensile strength R_m	MPa	1,000	500
Elongation A	%	< 2	30
Hardness	HV	280	140

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

Published by VACUUMSCHMELZE GmbH & Co. KG, Hanau, March 2022