



Preliminary datasheet

VACODUR® 49

STRIP MATERIAL

Composition

49% Co - 2% V - Fe Balance - Nb (present) / ASTM A801 Alloy Type 1

Main properties

Very high saturation induction up to 2.35 T
Adjustable yield strength up to 390 MPa

Applications

High performance motors with maximum power density and low losses

Magnetic properties (typical values)

Coercivity	H _C	50 A/m (optimum magnetic properties) 110 A/m (optimum mechanical properties)
Saturation polarisation	J _S	2.30 T
Maximum permeability	μ _{max}	7,000 (optimum magnetic properties) 15,000 (optimum mechanical properties)
Curie temperature	T _C	950 °C

Static virgin curve (typical values)

Magnetic field strength	H	(kA/m)	0.3	0.8	1.6	4.0	8.0	16
Induction @ R _{p0,2} = 210 MPa	B	(T)	1.90	2.10	2.20	2.26	2.28	2.30
Induction @ R _{p0,2} = 390 MPa	B	(T)	1.80	2.05	2.15	2.25	2.27	2.30

Iron losses for strip thickness 0.35mm (typical values)

Induction	B	(T)	1.5	1.5	2.0	2.0
Frequency	f	(Hz)	50	400	50	400
Loss @ R _{p0,2} = 210 MPa	p _{Fe}	(W/kg)	1.6	31	2.5	60
Loss @ R _{p0,2} = 390 MPa	p _{Fe}	(W/kg)	2.9	43	5.0	78

Physical properties (typical values)

Density	ρ	8.12 g/cm ³
Specific electrical resistivity	ρ _{el}	0.4 μΩm
Thermal expansion coefficient	α	9.15 · 10 ⁻⁶ 1/K (20...200 °C)

Mechanical properties (typical values)

		optimum magnetic properties	optimum mechanical properties
Tensile strength	R _m	400 MPa	720 MPa
Yield strength	R _{p0,2}	210 MPa	390 MPa
Young's Modulus	E	200 GPa	250 GPa
Hardness	HV 10	185	220

Forms of supply and conditions

Strip material	0.05 - 1 mm
Delivery condition	cold rolled with optional coating

Important note: To achieve the typical values a final magnetic annealing is necessary

For optimum magnetic properties: 6h / 880°C, dry hydrogen atmosphere recommended
For optimum mechanical properties: 3h / 750°C, dry hydrogen atmosphere recommended