VACOFLUX 18 HR

COMPOSITION (in wt%)
18 Co – bal. Fe – 2.5 Cr – 2 V – 1.5 Mn

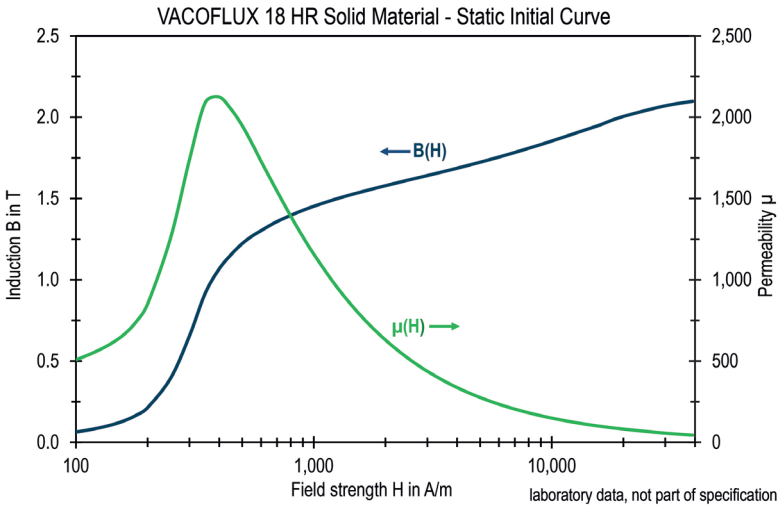
PRODUCT DESCRIPTION
VACOFLUX® 18 HR has been developed to improve the material performance of CoFe alloys with reduced cobalt content in applications with dynamic magnetization changes such as high performance magnetic actuators with short switching times.
VACOFLUX 18 HR is optimized to retain a high magnetic saturation while offering a significantly increased electrical resistivity compared to the complementary alloys VACOFLUX 17 and 27, thus limiting eddy currents in the material. Further additions improve the machinability of the material.

MAIN PROPERTIES
- Saturation polarization of J_S = 2.09 T
- Electrical resistivity of ρ_e = 0.65 µΩm
- Cost-optimized CoFe alloy with low cobalt content of 18 wt%
- Improved machinability

TYPICAL APPLICATIONS
Actuators, solenoid valves and other components with high switching speeds

FORMS OF SUPPLY
- Solid rods, diameters 12.5 – 182 mm
- Wire material, diameters 10 – 13.5 mm

Other diameters, square profile material and tolerances upon request



SOLID MATERIAL - TYPICAL VALUES

PHYSICAL PROPERTIES	Unit	
Mass density ρ	g/cm^3	7.81
Thermal conductivity (25 °C) λ	W/(m · K)	25
Thermal expansion coefficient (20 – 100 °C) α	10^{-6}/K	10.5
Electrical resistivity ρ_e	µΩm	0.65
STATIC MAGNETIC PROPERTIES		
Coercivity H_C	A/m	230
Saturation polarization J_S	T	2.09
Saturation magnetization B_S at H = 40 kA/m	T	2.14
Maximum permeability μ_{max}		2,500
Magnetostriction constant λ_S	ppm	+25
Curie temperature T_C	°C	920
MECHANICAL PROPERTIES (final annealed)		
Young's modulus E	GPa	210
Yield strength $R_{p\,0.2}$	MPa	400
Tensile strength R_m	MPa	600
Elongation A	%	28
Hardness	HV	200
MECHANICAL PROPERTIES (hot rolled)		
Yield strength $R_{p\,0.2}$	MPa	400
Tensile strength R_m	MPa	650
Elongation A	%	28
Hardness	HV	220
RECOMMENDED PARAMETERS FOR THE FINAL HEAT TREATMENT		
Atmosphere		hydrogen
Temperature	°C	800
Annealing time	h	10
Cooling rate	K/h	100 – 200

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