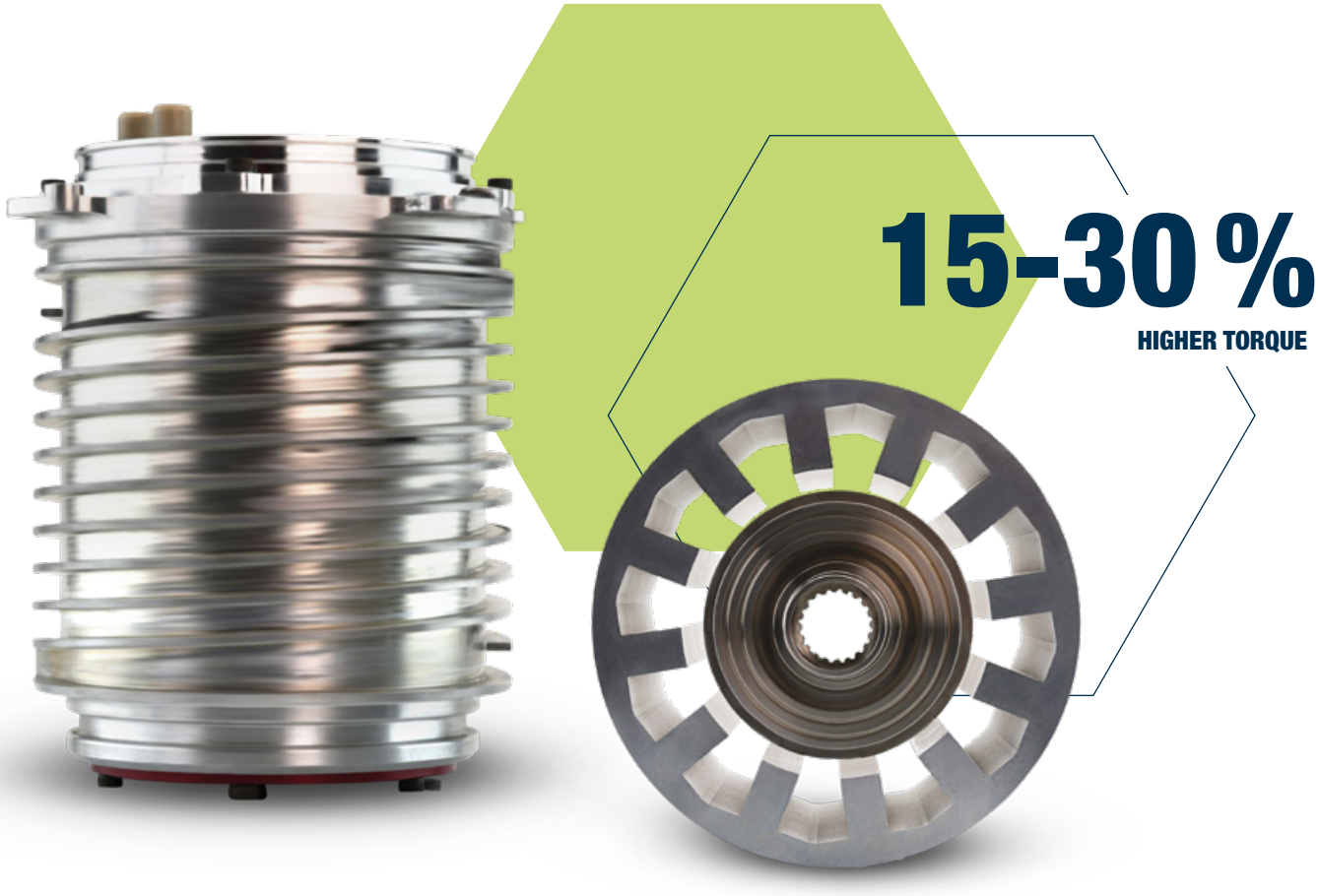
VACUUMSCHMELZE

TRINITY OF POWER

COBALT-IRON SOLUTIONS FOR HIGH-PERFORMANCE MOTORS

PRECISION PERFECTED

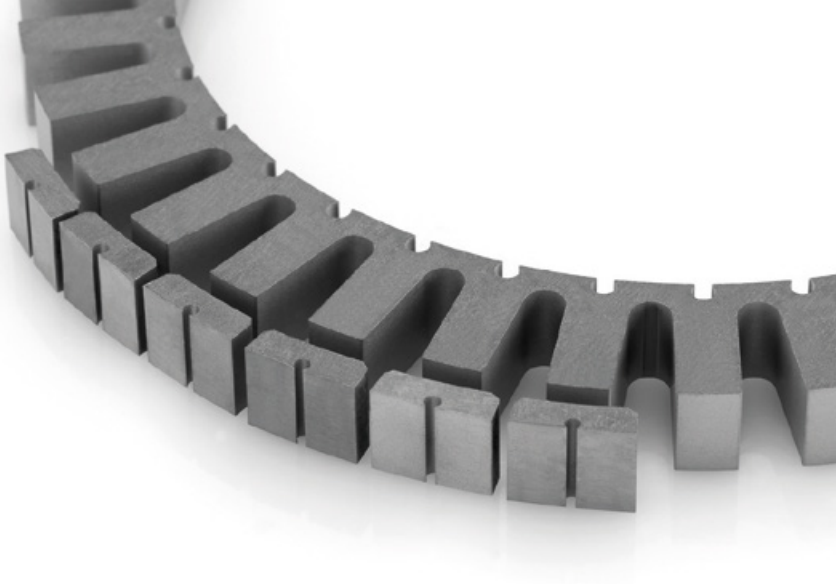
COBALT-IRON LAMINATION STACKS TO IMPROVE ELECTRIC MOTOR PERFORMANCE



FROM MATERIAL TO FINISHED PRODUCTS - ALL FROM A SINGLE SOURCE

AS A FULL-RANGE SUPPLIER of magnetic solutions, VAC combines material knowledge with manufacturing expertise. Our vertical integration enables precise harmonization of every individual step of the process. The advantages are obvious: Since VAC controls every step from material production and manufacturing of parts to the assembly of complete components such as rotors or stators, individual customer requirements are taken into account in every step of the process.

OUR CUSTOMERS' ADVANTAGE: Customers enjoy a comprehensive network of support from material science through process, to final stator and rotor assembly. A customer tailored focus to maximize performance, reduce cost and scrap, in a holistic supplier-partner relationship.



MULTIPLE COMBINATIONS ARE AVAILABLE -
from a few prototypes to high volume serial production.

ELECTRIC & HYBRID FLIGHT

RACING / MOTORSPORTS

FEASIBILITY STUDIES

AERONAUTICS & SPACE

ELECTRIC HYPERCARS

ROBOTICS & MEDICAL

HIGH PERFORMANCE AUTOMOTIVE

AUTOMATION & INDUSTRIAL APPLICATIONS

OUR ALLOYS

VACODUR® Max
provides the highest possible saturation for electric motors

VACODUR® 49
is the best-in-class ASTM 801 alloy

VACOFLUX® X1
with 17 % cobalt-iron we provide a cost optimized solution

STACKING TECHNOLOGIES

VACLOCK®
interlocking

VACOBOND®
bonded laminations

VACSTACK®
wire EDM

HIGH PERFORMANCE

TRINITY OF COBALT-IRON ALLOYS FOR ELECTRIC MOTORS

VACODUR MAX

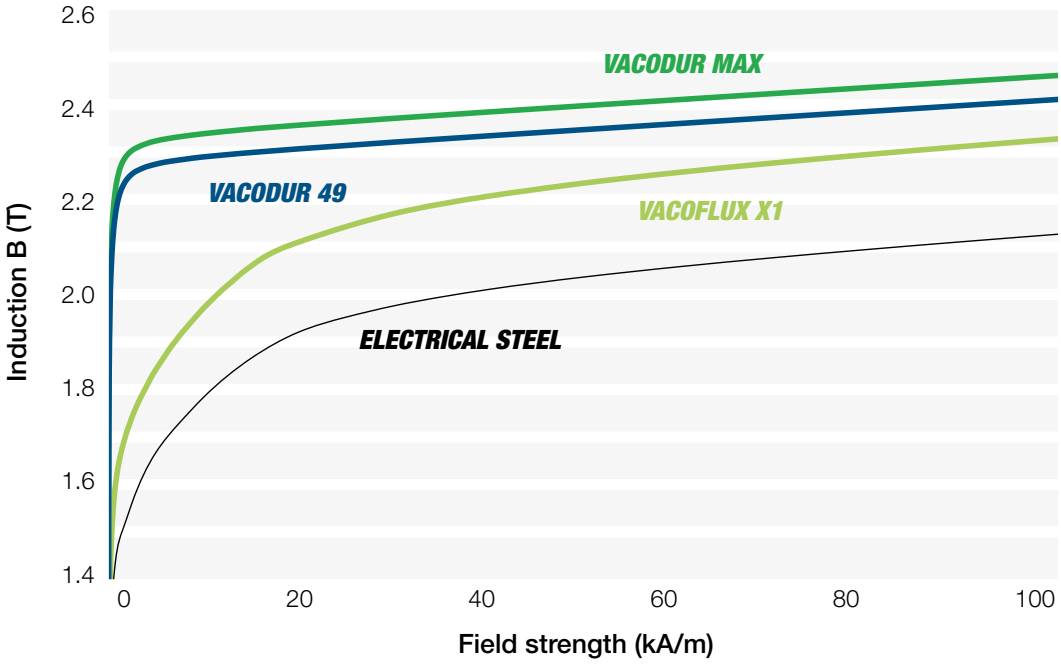
(49 % Co – 1 % V – Fe)

Most recent Permendur grade with highest possible saturation for electric motors at its best.

J_s Increased polarization saturation of 2.35 T compared to 2.30 T for ASTM standard
⟶ ***HIGHER POWER/TORQUE DENSITY***

H_c Reduced coercivity
⟶ ***LOWER HYSTERESIS LOSSES***

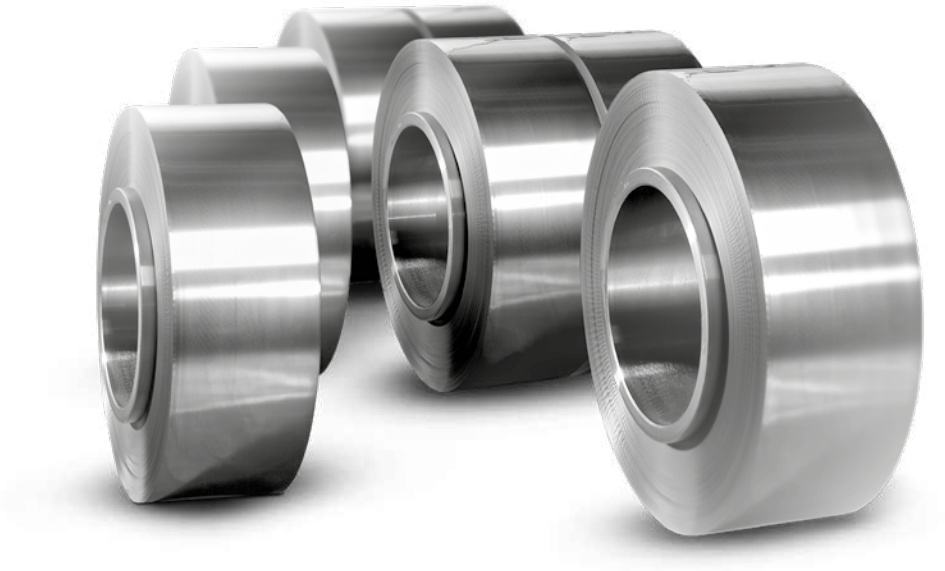
T Magnetic properties optimized for temperatures above 100 °C
⟶ ***ADAPTED TO REAL APPLICATION CONDITIONS***



VACODUR 49

(49 % Co – 2 % V – Fe)

Best-in-class ASTM 801 alloy
Approved for high performance motors
(e.g., aerospace & hypercars).



VACOFLUX X1

(17 % Co – 1.5 % V – Fe)

New CoFe alloy for cost optimized high performance motors
(e.g., automotive & automation).

VACODUR MAX & VACODUR 49

49 % cobalt-iron alloys for stator or rotor stacks
If required, stator and rotor laminations can be stamped together in one process.
Adapted annealing is offering high yield strength up to 400 MPa for rotor stacks.

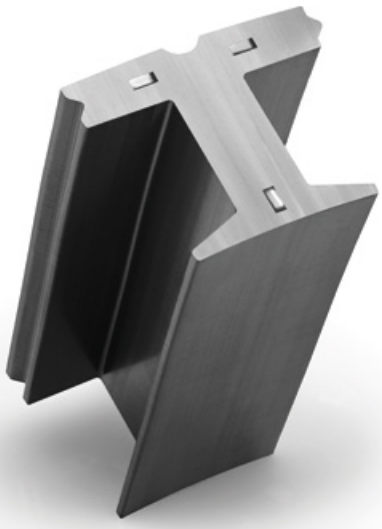
VACOFLUX X1

17 % cobalt-iron alloy, developed for cost-optimized interlocked stators.
For best material utilization, segmentation or single tooth design is recommended.

COMPLETE IN-HOUSE CAPABILITY

TRINITY OF TECHNOLOGIES FOR STATOR AND ROTOR LAMINATION STACKS

	VACSTACK
Cutting process	wire EDM
Stacking process	bonding
Annealing level	sheets
Minimum strip thickness	0.055 mm
PROTOTYPING & RAMP-UP	
single tooth	yes
full stacks	yes
TOOLING COSTS	
single tooth	none
full stacks	none
Production costs	high
Typical production volume	1 – 10

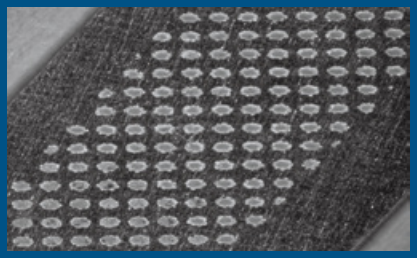


VAC has in-house capabilities from prototypes to high volumes. Serial production follows automotive and aerospace standards (IATF 16949 & EN 9100).

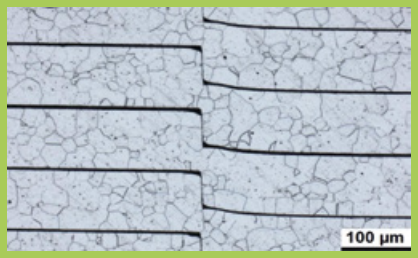
0.055 mm strip thickness

Lowest losses and stacking factor > 97 %

VACOBOND		VACLOCK
laser-cutting	stamping	stamping
bonding		interlocking
laminations		stack
0.1 mm		0.1 mm
yes yes	yes no	yes no
low low	low medium	low medium-high
high	medium	low-medium
10 – 1000	100 – 1000	> 100
200 µm dot size		**0.1 mm strip thickness**



Precisely defined and well controlled gluing dots



Mechanical stacking but ensuring insulation layer

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