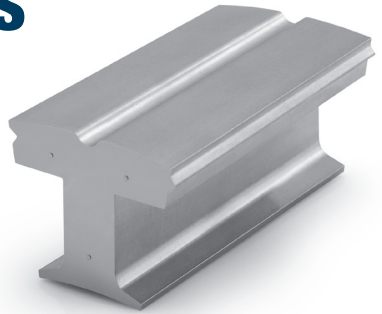


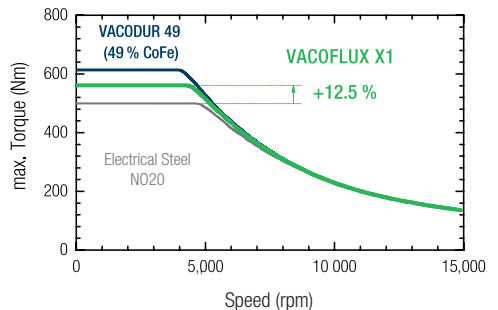
FOR HIGH PERFORMANCE ELECTRIC MOTORS

COST OPTIMIZED COBALT-IRON SINGLE TOOTH STACKS

Best in class cobalt-iron
ASTM A801 alloy VACODUR 49 and
new cost optimized development
VACOFLEX X1



- Interlocking technology down to 0,2 mm strip thickness offering highest efficiency and lowest production costs
- Full, in house process control from the melt to finally annealed stacks including sophisticated magnetic and dimensional inspection facilities
- Fast prototyping with serial quality by using our new, modular stamping tool concept for small to medium quantities
- Serial production according to automotive and aerospace standards (IATF 16949 / EN 9100) including full documentation and traceability



Case study by drivetek ag, Switzerland

ADVANCED MAGNETIC SOLUTIONS

VAC[®]
VACUUMSCHMELZE

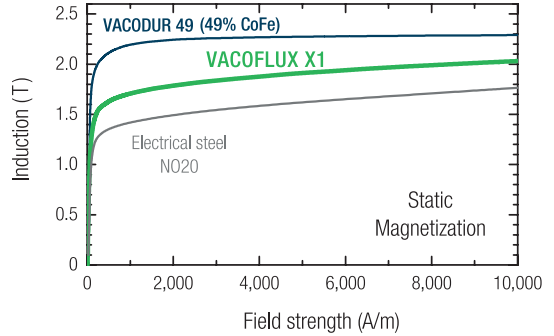
MATERIALS

VACODUR® 49:

ASTM A801 alloy with adjustable magnetic and mechanical properties

VACOFLUX® X1:

Latest, cost optimized cobalt-iron alloy to fill the gap between electrical steel and ASTM A801 grades



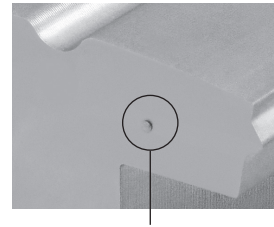
INTERLOCKING TECHNOLOGY

- Interlocking technology provides stamping and stacking in one step, directly from the tool
- Simplified process flow allows final annealing of entire stack to reduce cost and ensure excellent repeatability and quality
- Strip thickness down to 0,2 mm for both VACODUR 49 and VACOFLUX X1 for reduced iron losses and improved performance efficiency
- Very thin ceramic based insulation systems developed by VAC offer stacking factors of typically 97 % and excellent interlaminar insulation

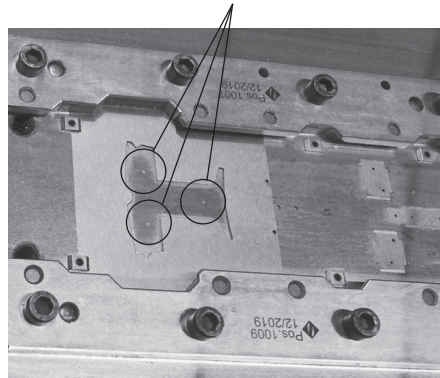


MODULAR STAMPING TOOL CONCEPT

- Uses 48 mm strip width to fit most single tooth designs and strip thickness of 0,2 mm for low losses
- Cost optimized interlocking and fast prototyping setup for small and medium quantities
- Required material with 48 mm strip width always available (VACODUR 49 and VACOFLUX X1)

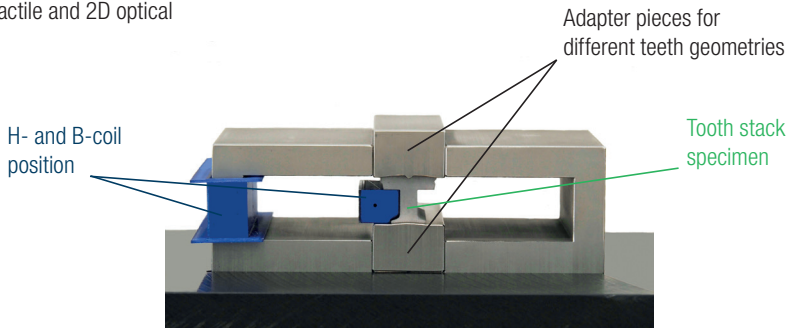


interlocking dimples



FINAL INSPECTION AND QUALITY CONTROL

- All development and production processes according to automotive (IATF 16949) or aerospace (EN 9100) standards
- Zeiss 3D tactile and 2D optical inspection
- Unique magnetic inspection device dedicated to single tooth stacks developed by VAC



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