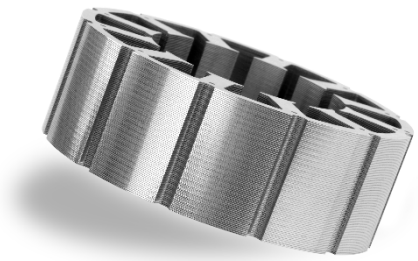
New cobalt-iron material for motor applications

The golden center

High power combined with low weight is a central requirement for electrical high-performance drives. In aviation or motor sports, laminations made of cobalt-iron alloys from VACUUMSCHMELZE (VAC) are frequently used for this purpose, as typically 20-30 % higher power densities can be achieved compared to electrical steel. For long the technology transfer to premium vehicles or high-performance industrial applications has not made sense due to economic reasons. With the new CoFe alloy VACOFLUX® X1, VAC has now succeeded in closing the existing gap between electrical steel and materials with a high cobalt content. This enables engineers to adapt this technology for a broad range of applications.



The technical advantages of the new material were demonstrated in a comparative study conducted by the Swiss company drivetek ag. The basis of the study is a traction machine with an output of 250 kW. The design aimed at the highest possible torque density. With VACOFLUX X1, torque increases of up to 12.5 % compared to NO20 could be achieved. It was not necessary to adapt the rotor, i.e. the effort for the qualification of the new material is negligible, since no recalculation and optimization of the rotor strength are necessary.

In addition to the aforementioned gain in torque, an increase in efficiency is achieved at comparable working points. Depending on the working point, copper losses can be reduced by up to 28 %. This leads to an increase in the achievable range of the vehicle without having to increase the size of the battery. By a stronger focus on the optimization of the efficiency this could be increased even further, striving for a gain in the achievable torque.

"We are delighted to be able to make motorsport technologies available to a wider audience with this groundbreaking material," says Norman Lemm, Head of Business Intelligence & Communication at VAC.