Product-Innovation Information

Hybrid-Reluctance Motor Magnet

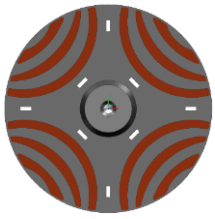
Max Baermann GmbH
Plastic-bonded permanent magnets

Short Description

Classification Hybrid-Reluctance Rotor-Magnet

Build Structure Punch-bundled Rotor on shaft with slot recesses
Slot recesses filled with plastic-bonded magnet-compounds according to customer specifications/requirements

Magnet-Compounds Ferrite-, isotropic Neodymium & high remanent anisotropic rare-Earth compounds



Sizes

Length:	> 60 mm
Diameter:	> 44 mm
Slots:	down to 1 mm

Advantages

No cutting and gluing of sintered magnets

Elimination of avoidable process steps
Elimination of auxiliary materials and its disadvantages
Reduction of potential errors

Lean processing

Ferrite Compounds
Only one process-step for Injection Molding & magnetizing
Isotropic Rare Earth compounds
Injection Molding with subsequent magnetization in coil for full magnetic saturation for high flux densities

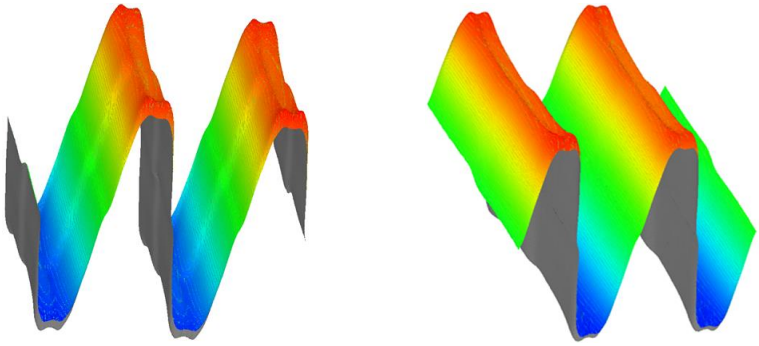
Loss free performances even at high temperatures

Due to special developed Ferrite-Compounds with demagnetization-safe characteristics optimized for strong counteracting magnetic-fields in automotive applications

Wide performance variety within one design

Cost reduction by standardized design for different performance levels due to compatibility with all kinds of magnetic-materials

3D Visualization of the magnetic field



For more detailed information regarding exact curve characteristics & magnetic field strengths, please contact us according to the contact information below

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Detailed Information

Permanent Magnets for Hybrid-Reluctance Motors

Usually for hybrid reluctance motors sintered magnets are mounted into the soft magnetic rotor. This originates additional labor costs as well as processes like magnet cutting as well as gluing. Especially the latter might not be safe under all conditions.

MB has developed respective magnets as injection molded magnets, as can be seen in Figure 1. Here even finest slots down to 1mm thickness as shown in the photo can be realized. These magnets cover all ranges from injection molded Ferrite over isotropic NdFeB materials up to anisotropic high remanent Rare- Earth based compositions. Whereas the latter are mainly usable for industrial appliances, Ferrites as well isotropic NdFeB compositions are viable for automotive applications.

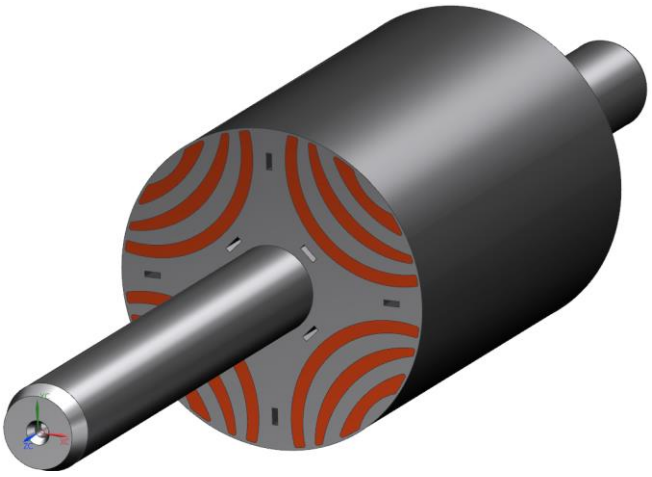

Figure 1 – Hybrid reluctance magnet

The anisotropic Ferrite materials can be oriented and magnetized completely inside the mold, so that no additional labor costs for the rotor are needed. Here special material compositions have been developed so that even axial lengths longer than 60mm can be filled completely. As in automotive applications strong counteracting fields can act onto the magnetic material, special Ferrite compositions with demagnetization-safe characteristics have been developed. These lead to loss free motor performances even at extreme temperatures.

Magnets based on Rare-Earth alloys demand an additional pulse magnetizing step to polarize them into magnetic saturation after injection molding. Respective demagnetization coils could be built and led to the expected increase of flux density in comparison to Ferrite based systems. So, depending on the customer demands for flux density, rotors of various strength can be realized.

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