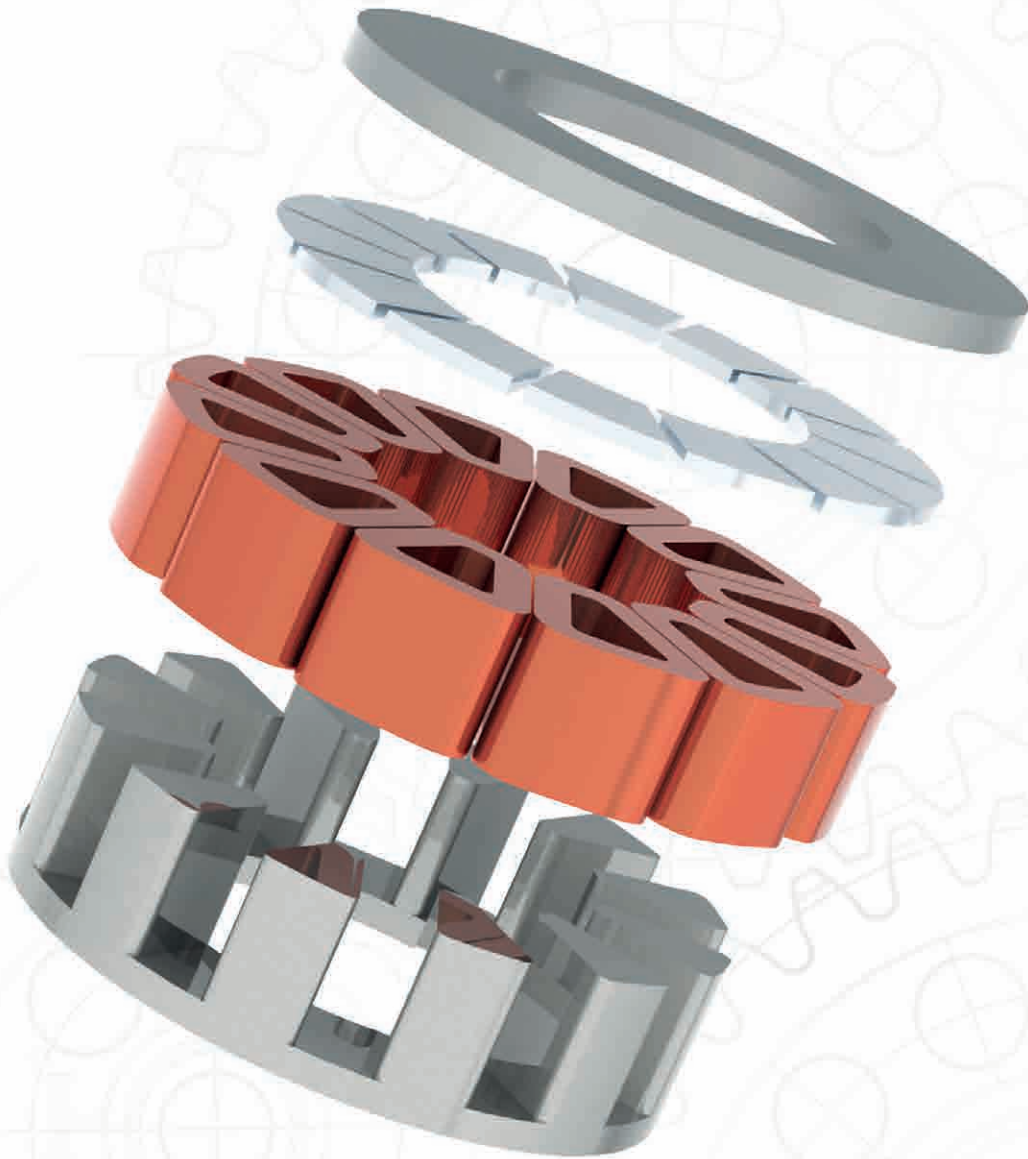


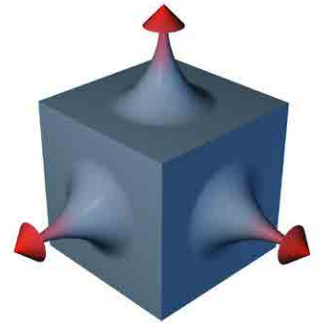
# Axial Flux

Machine solutions



# Somaloy<sup>®</sup> the optimal material choice for Axial Flux Machines

Somaloy is an isotropic, high resistive soft magnetic composite material for electromagnetic applications. Somaloy makes it possible to design innovative, compact and powerful electric motors that match your specific application. The secret is the unique 3D flux properties and net-shaped components, which is optimal for Axial Flux Machines.



Somaloy is tailored for high volume, cost-efficient component production by utilising the Powder Metallurgy (PM) forming process. The components are ready to use after compaction and heat treatment. They enable the design of space-efficient coil/core assemblies in various motor topologies where high efficiency and compact design are required.

## Why Axial Flux Machine?

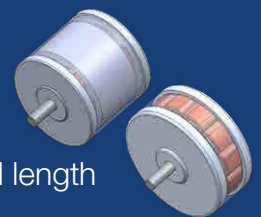
Axial Flux Permanent Magnet machines (AFPM) are very compact constructions with high torque- and power density. Still, high efficiency can be maintained over a wide operating range. Complex mechanical challenges can now be overcome by improved design and new manufacturing techniques. The AFPM's typically larger diameter and shorter axial length adds benefits to many applications. Using larger number of poles helps to save electromagnetically active material for a given high output. Ranging from low speed, high torque to medium/high speed, low torque concepts, a wide range of applications can be considered. The features of AFPM's make them suitable for applications in a wide power range such as for Electric Vehicles (EV), Hybrid Electrical Vehicles (HEV), pumps, fans, compressors, valve control, hoists, power- and wind generators.

### Cost-efficient

- Net-shaped 3D components made with very low scrap rate
- Pre-wound slide-on and tightly wound coils
- Simple, automated assembly with lower investments

### Compact design

- Space-efficient coil/core assemblies
- Topologies for short axial length
- High frequency operations at low losses



### High performance

- High torque and high power density
- Thermally isotropic core and tight coils enables enhanced cooling
- High efficiency concepts possible

# Be inspired – concept solutions

## Single sided concept

The PM-process supplies single complex components to final shape without subsequent machining.

### The careful design brings:

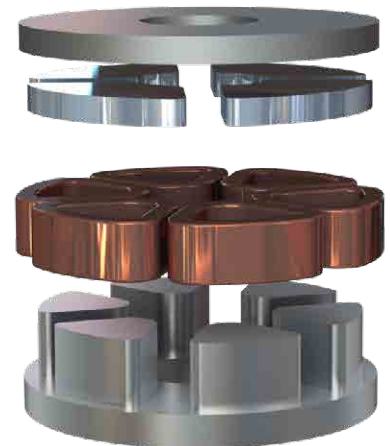
- Low cogging and ripple torque despite large slot-openings.
- Simple pre-fabricated coils on bobbins that easily slides onto the poles.
- Very space-efficient coil/core assembly.
- High fill factor and less end-windings.



*Modular I*



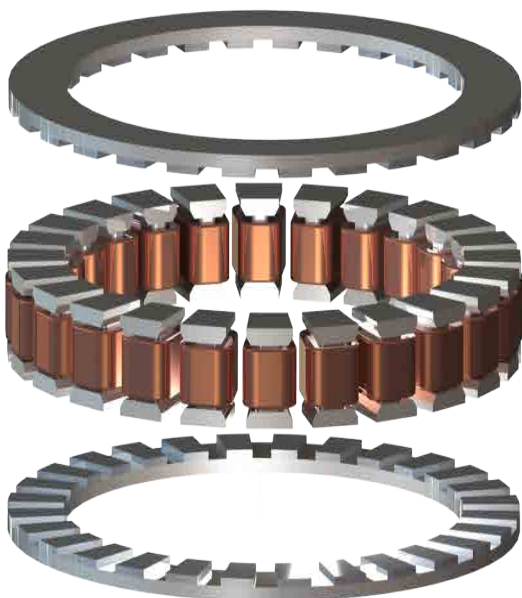
*Modular II*



*Single component*



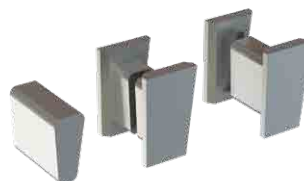
Typical applications are pumps, compressors and fans for automotive, industrial and household appliances.



*Modular component*



*Modular I*



*Modular II*

## Double sided concept

The double-sided AFPM (one stator, two rotors) is the most efficient concept using Somaloy. This is normally referred to as the Yokeless And Segmented Armature (YASA) concept.

### These larger motors bring:

- Proven outstanding torque- and power density.
- High pole number and made from a larger number of small modules.



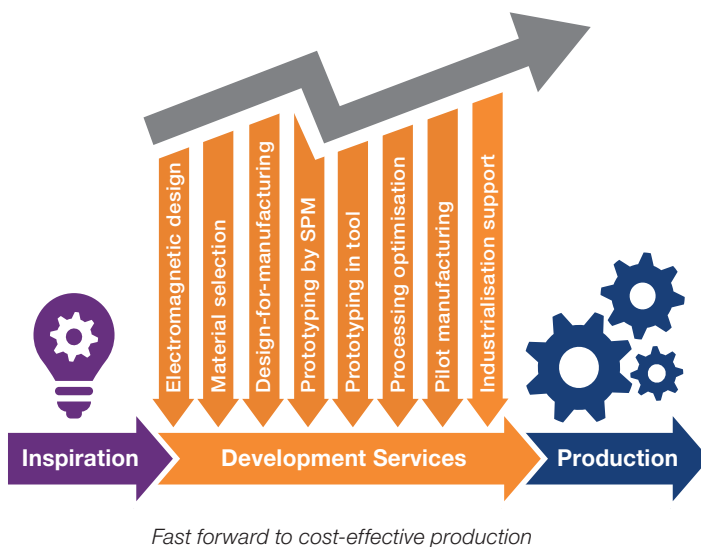
These concepts are especially suitable for EV and HEV traction motors.

# Driven by vision

Our target is to speed up time-to-market for our customers, and by providing development services, Höganäs supports you from idea to high volume production. This will give you the benefits of cost-effective manufacturing, compact component design and high performance applications.



We will share the knowledge and the success factors to help you achieve your vision.



## Höganäs – your business partner

Höganäs is the world's leading producer of iron and metal powders. As an established business, you can rely on Höganäs to deliver whatever matches your needs. We have been developing soft magnetic composites for more than 15 years and are well experienced in motor technology. As a major supplier to the automotive industry, Höganäs works with all the recognised quality standards.

With exclusive know-how of Somaloy® material, design and production process, Höganäs will inspire and guide you through the new generation of material technology in your development project.



### Höganäs short facts

- 3,000 customers in 75 countries
- More than 1,500 products, mostly customer specific, from 13 production centres
- Around 700 granted patents
- Turnover 2015: 7,590 MSEK
- 1,800 employees
- Established in 1797 as a coal mining company.
- Owned by FAM and Lindégruppen



### Find out more

Contact your local sales representative or visit [www.hoganas.com/somaloy](http://www.hoganas.com/somaloy)