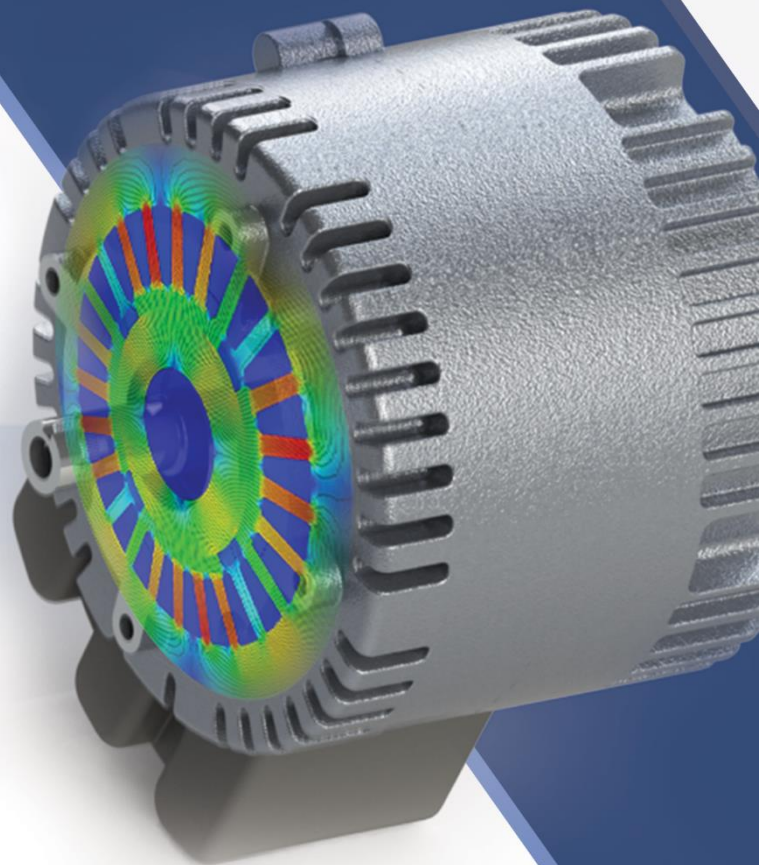




EMWORKS
www.emworks.com

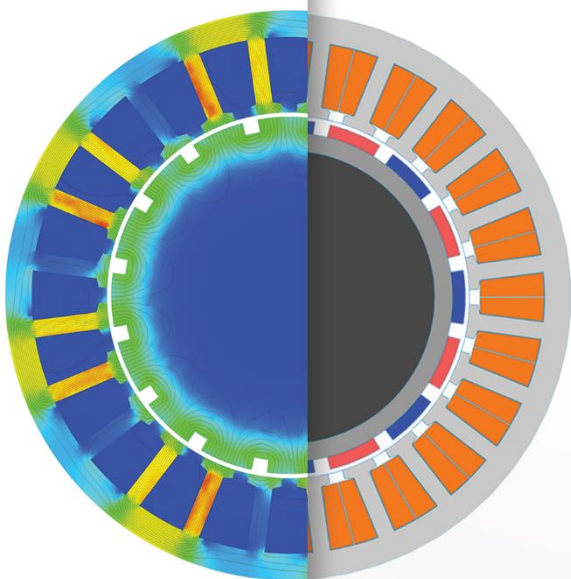


Mz

MotorWizard

The Only Electrical Machine Design Software Fully Embedded in SOLIDWORKS

MotorWizard is part of EMWorks' complete motor design solution inside SOLIDWORKS. It streamlines model creation and simulation thanks to its extensive library of built-in SOLIDWORKS native motor templates and its automated analytical and finite element analysis engines. Getting on optimized machine design has never been this easy!

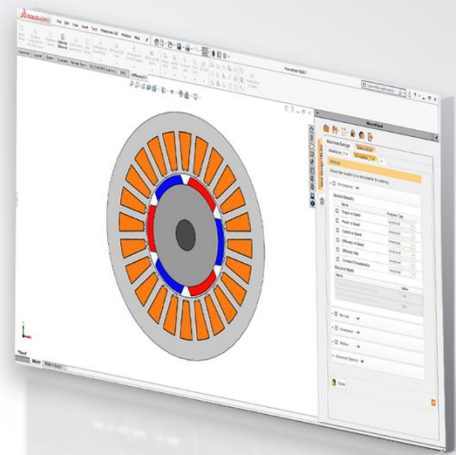


**CERTIFIED
GOLD
PRODUCT**

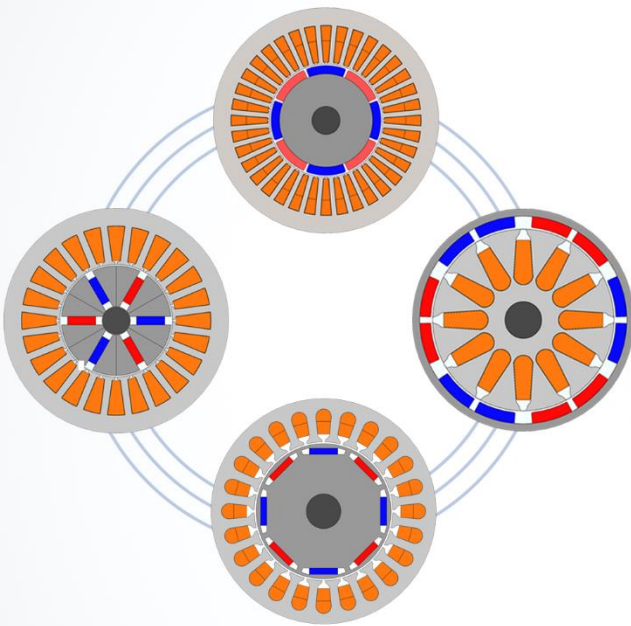
 **SOLIDWORKS**

User-Friendly and Intuitive Interface

Short learning curve and easy to use program contains predefined setup and results there by avoiding the process of defining scenarios, mesh refinement and boundary conditions.



Different Topologies and Easy Topology Editor

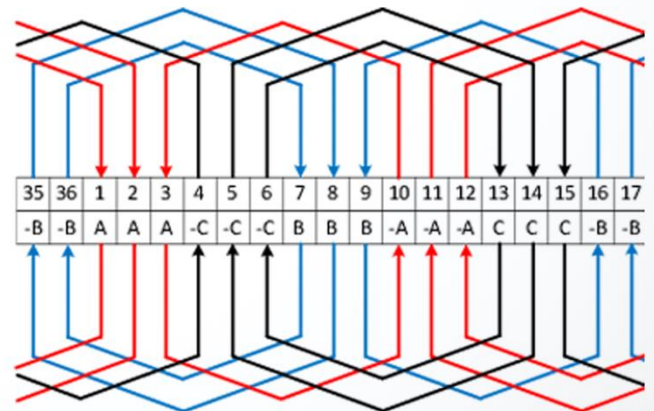


Customizable templates for easy and fast development of the different electric machine models obviating the need to create model from scratch in SOLIDWORKS:

- BLDC Interior Permanent Magnet
- BLDC Surface Mounted Permanent Magnet
- BLDC Spoke Permanent Magnet
- BLDC Inset Permanent Magnet
- Interior and Exterior Rotor Configuration

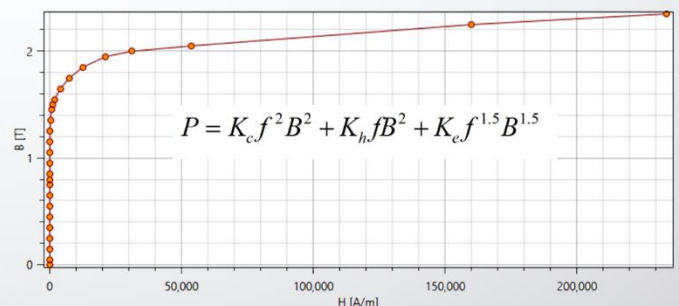
Automatic Winding Editor

Ability to automatically create different winding configurations such as single- or double-layer, concentrated or distributed, full-pitched or shorted pitch easily.



Large Customizable Material Library

Wide range of materials such as permanent magnets, steel lamination, conductors and insulators are included in the material library.



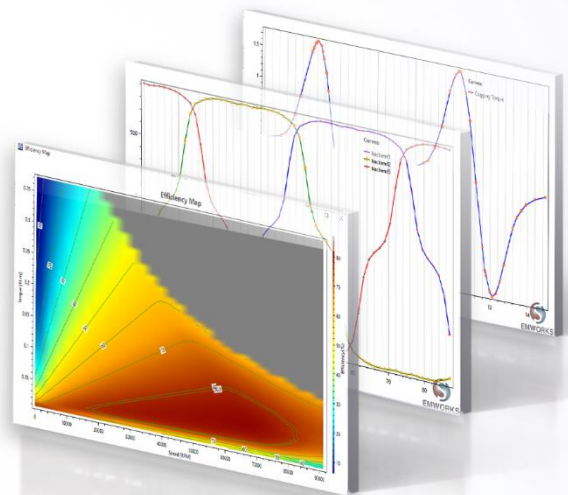
A Diversity of Analysis Techniques for a Variety of Results

MotorWizard leverages analytical, semi-analytical and finite element techniques to accelerate the process of analysis and to provide accurate results for the machine performance. Analytical and semi-analytical analyses generally rely on average (or RMS) values of the parameters and are used to predict steady state of the machine using Maximum Torque Per Ampere Technique (MTPA). Thus, the well-known dq model of the machine is utilized to provide results with high accuracy.

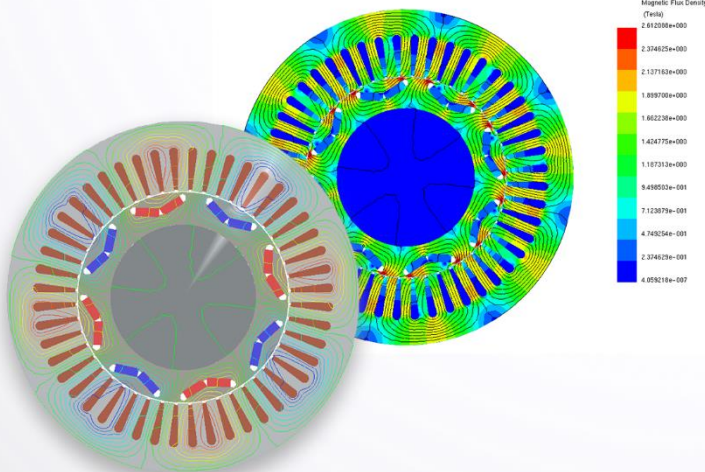
Finite element analysis gives a better understanding of effects of different phenomena on both the value and the waveform of different characteristic parameters at different conditions. Sine wave excitation corresponding to permanent magnet synchronous motor (PMSM) operation and square wave excitation corresponding to Brushless DC motor (BLDC) operation are provided.

Steady-State Results

- Torque vs Speed
- Input and Output Powers vs Speed
- DQ Voltage vs Speed
- DQ Current vs Speed
- Core Losses vs Speed
- Copper Losses vs Speed
- Efficiency Map



FEA Results



- Winding Flux Linkage Waveform
- Phase and Line-to-Line Back EMF Waveforms
- Cogging Torque
- Inductance Profile
- Torque vs Rotor Position at Certain Current
- Input and Output Powers
- Losses
- Magnetic Field Distribution
- Magnetic Flux Density Distribution