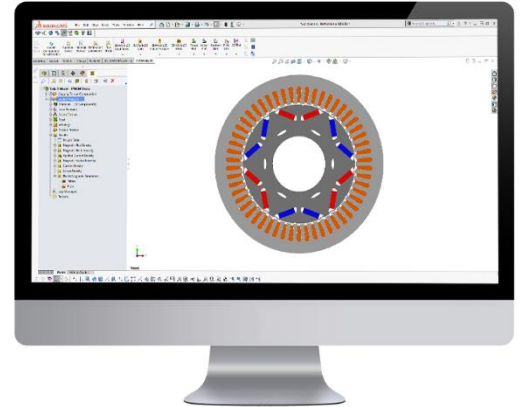EMWorks2D

2D EM Simulation Software

Efficient tool for electromagnetic and electro-mechanical simulation

EMWorks2D is an electromagnetic simulation software, fully embedded in SOLIDWORKS, that uses finite element analysis (FEA) to solve magnetic, electric and transient problems. Models with planar (XY) and axisymmetric (RZ) invariance geometries can be solver in 2D which can help you to test and improve your designs in record time and less cost.

EMWorks2D can be used to accurately design virtual prototypes of actuators, sensors, transformers, electric machines, busbars, magnetic gears, bushings, insulators and other electromagnetic and electromechanical devices.
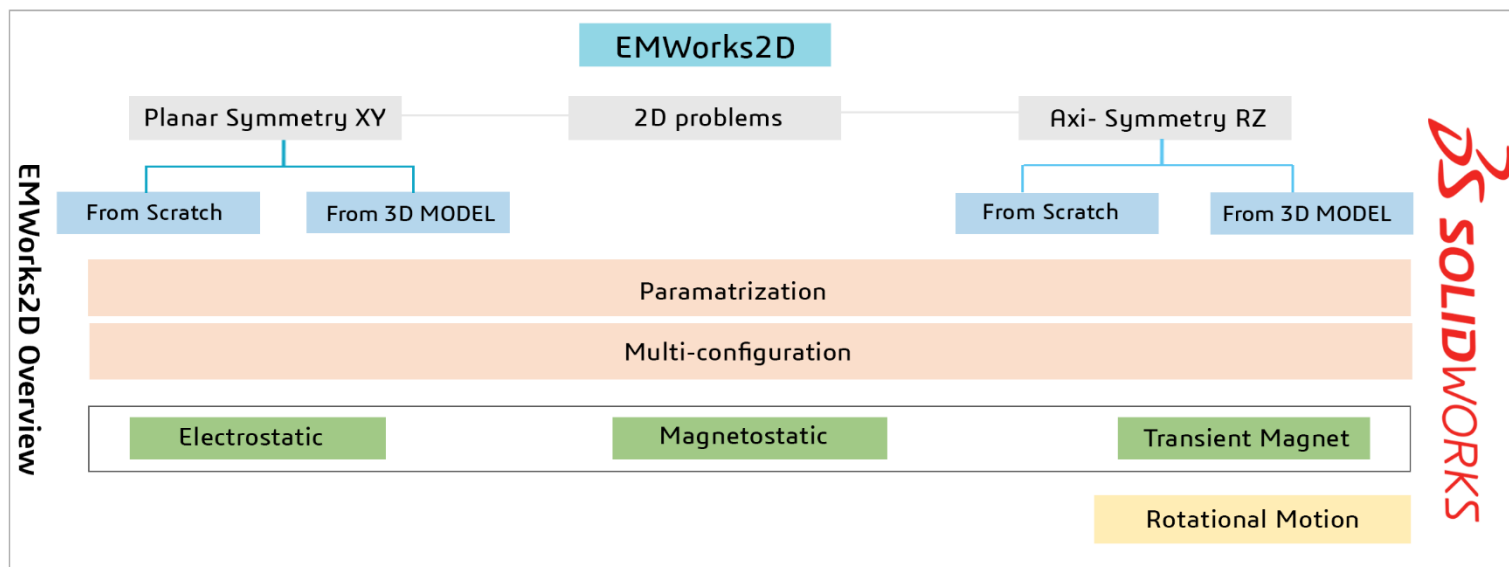
Products Highlights

- Ideal for complex problems, EMWorks2D, an easy-to-use program with extremely intuitive workflow that makes the learning curve short and the user experience favorable.

- Powerful combination of a leading CAD tool and accurate EM simulator inside the same environment that allows smooth incorporation of your EM simulation into your product development process.

- Wide range of capabilities and features to meet efficiently your targets and covers your design needs.

- EMWorks2D is the only 2D EM simulation software fully embedded inside SOLIDWORKS.

"

The relation with EMWorks has been easily accessible because of a quick implementation of our software into SOLIDWORKS. CAD-files are transferred easily with an automated 2D simplification"-tool. The function as well as the interface of the Software are intuitive," which allows us to finish simulations autonomously in less than 10 minutes from the CAD file Whenever we have trouble EMWorks supports within little time to our full satisfaction

Denis Frank - Research & Development
Schienle Magnettechnik + Elektronik GmbH, Germany

EMWorks2D

Planar Symmetry XY	2D problems	Axi- Symmetry RZ

| From Scratch | From 3D MODEL | | From Scratch | From 3D MODEL |

Paramatrization

Multi-configuration

| Electrostatic | Magnetostatic | Transient Magnet |

Rotational Motion

DS SOLIDWORKS

Post Processing Environment and Results

EMWorks2D includes a dedicated post-processing environment to preview and analyze the results such as field plots, chart plots, tabular results, compare results between studies, probs, report and more.

- Fields (electric, magnetic, potential, solid loss)
- Circuit parameters (inductance, resistance, flux linkage induced voltage)
- Mechanical quantities (force, torque)
- Losses (eddy loss, hysteresis loss, excess loss, ohmic loss)
- Current, voltage
- Stored energy
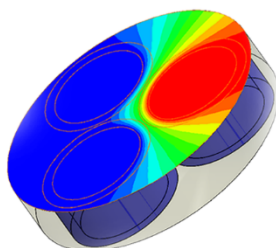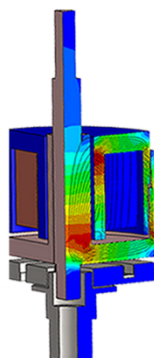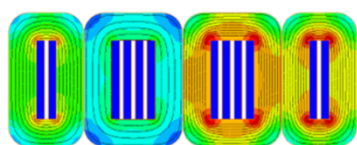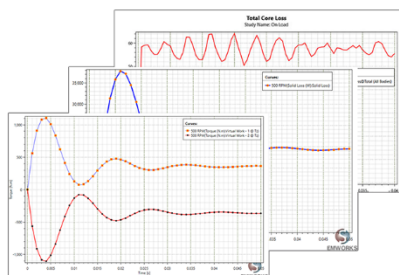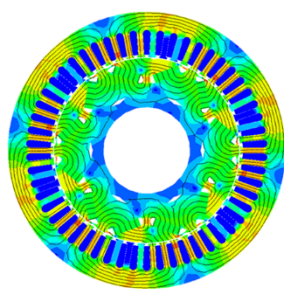
EMWorks2D can be used for many applications in different fields and industries including:

Electromechanical

Actuators
Eddy Current Braking Systems
Magnetic Gears
Motor & Generators
Relays

Power Electronic

Bus bars
Inductors
NDT
Transformers

Electromagnetic

Coils
Permeant Magnet
Sensors
Voice Coils

More Applications

Bushings
Capacitors
Electrostatic Discharge
Insulators
Wireless chargers

Find out more: www.emworks.com

Seamless integration inside SOLIDWORKS

EMWorks2D enables engineers to incorporate electromagnetic simulation into the product development process.

The seamless integration inside SOLIDWORKS brings the following benefits to the users.

- Allow the direct use of the CAD model without leaving SOLIDWORKS, with the possibility of making drastic changes to the initial design.
- Maintain the integrity of the design by avoiding the export/import CAD geometry for simulation purpose.
- Short learning curve and familiar workflow.
- Saving time and effort by using the automatic 3D to 2D geometry conversion feature.
- Powerful combination of a leading CAD tool and accurate EM simulator in the same environment.
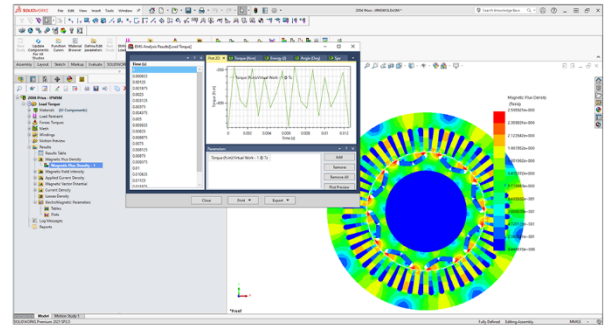
2D Simplification: Automatically extracts a 2D model from a 3D model
Make the geometrical transition effortless and fast, especially for complicated models
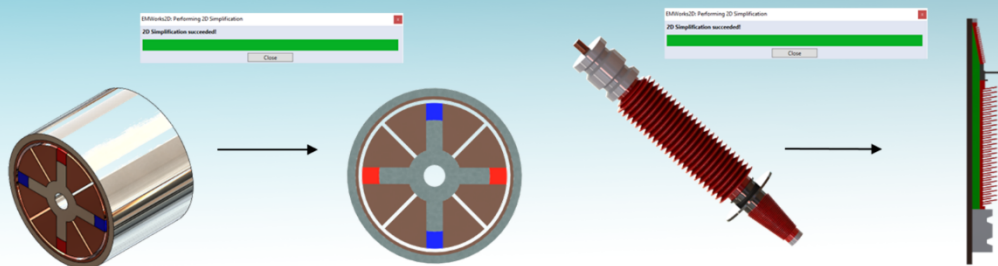
User-friendly and intuitive interface

Ideal for complex problem, EMWorks2D, an easy-to-use program with extremely intuitive workflow helps you to achieve your objectives effectively.
Follows the same philosophy of SOLIDWORKS workflow, which makes the learning curve very short.

“
We have been successfully using SOLIDWORKS in combination with EMWORKS for several years to design and calculate these systems.
EMWORKS helps us to carry out precise magnetic field calculations, especially in rare earth applications, which allow a precise analysis of the magnetization devices to achieve faster cycle times in production.

Heinz-Dieter List
List-Magnetik Dipl.-Ing. Heinrich

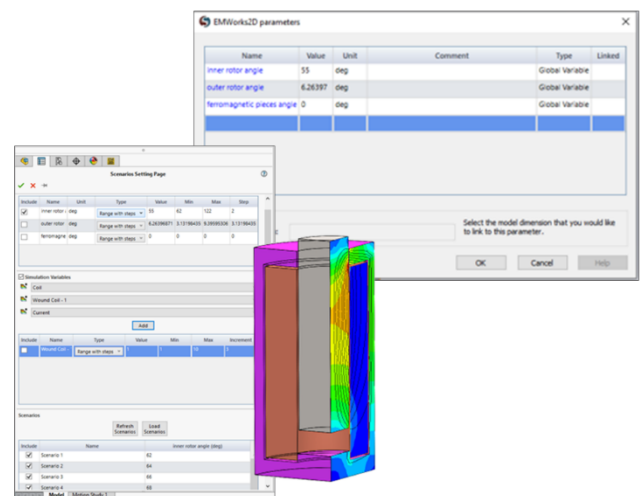**EMWORKS**

Material Library

EMWorks2D comes with a rich and well-organized materials library. It includes the following properties and features:

- Large material library: conductors, insulators, permeant magnet, laminated steel.
- Extensible material library (edit, or customize, or add new material.
- Wide range of electrical steel with BH curves.
- Automatic BH curve generation using B saturation and initial permeability.
- Permanent magnets.
- Core loss and lamination properties.
- Isotropic and anisotropic material properties.
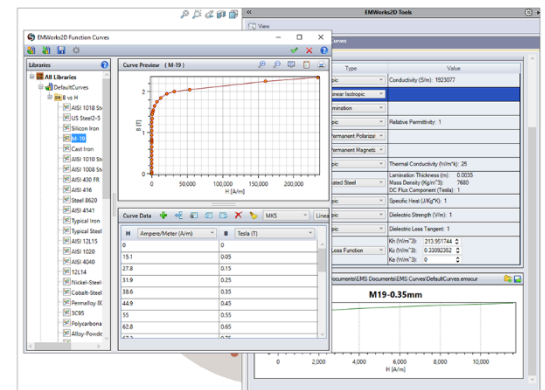
Parametric Simulation

EMWorks2D enables numerous What if? analyses to obtain the best design for your application. Any CAD dimension or a simulation variable can be set as a parameter to study the effect of its changes on your design. This serves as a first step to optimize your designs.

Rotational Motion Coupling

EMWorks2D allows to couple a Transient Magnetic study to rotational motion.

Thus, EMWorks2D can be used as a motor design software and can be used to virtually study critical electric motor design parameters, including.

- No load Analysis: back emf, cogging torque, short circuit response
- Load Analysis: Load torque, current and voltage results
- Core loss, eddy current losses, winding losses Resistance and inductance matrices, flux linkages
- Airgap flux
- Speed and angular position

EMWORKS
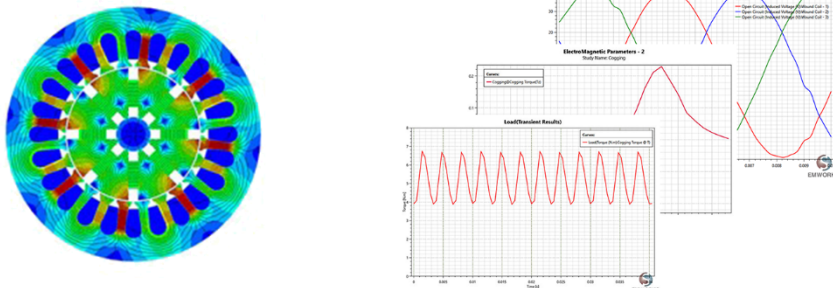
Learning resources and ready to go examples

A vast library of learning materials and tools is at your disposal to help you learn to use and master the software quickly and easily.

A variety of learning materials are available such as:

- Step by step video tutorials
- Application notes and webinars
- Tutorials and help
- Demo viewer feature (more than 30 models ready to solve)
- Training
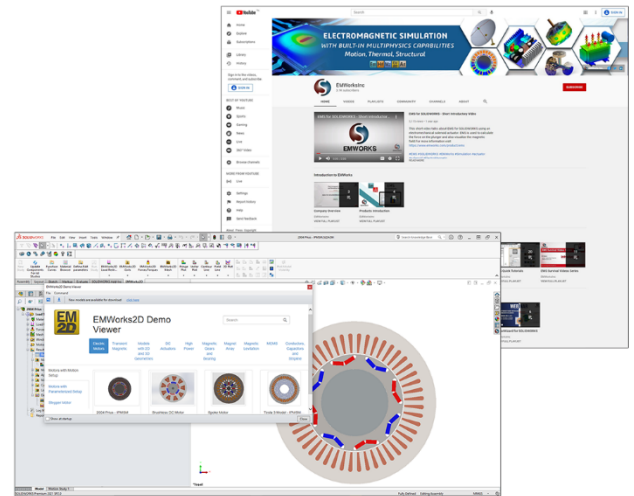
Support and after sales commitments

No matter what the size of your company is, together with our highly qualified support team and experts we will be part of your solution and we will provide you the necessary assistance to achieve your goal in short time and less cost.

"We are very satisfied with the fast service for questions about the EMWORKS software, you always get a quick answer or a problem solution.

Heinz-Dieter List
List-Magnetik Dipl.-Ing. Heinrich List GmbH

Consulting and Design Services

EMWorks consulting and design services can help you save money and time to incorporate simulation in your design process and thereby get your products to market before your competitors. EMWorks consulting services can help you:

- Explore new design ideas from scratch.
- Evaluate, refine, and optimize existing designs using our simulation products.
- Automate existing processes that you follow with SOLIDWORKS CAD.
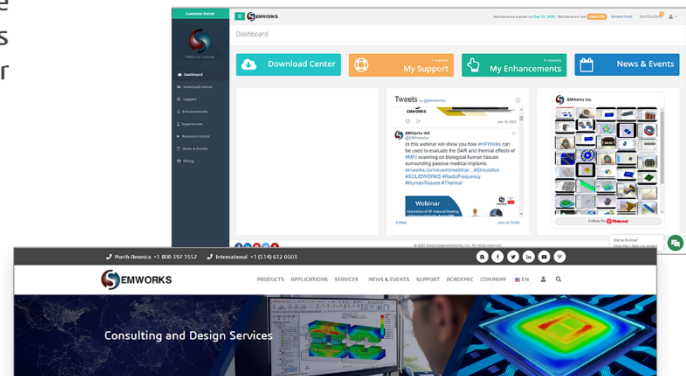
We have a reliable, fast, and affordable solution that best meets your unique needs. Our engineers and developers have expertise and experience in wide range of engineering design simulation and applications.