BROCHURE

Ansys Maxwell

Ansys simulation technology enables you to predict with confidence that your products will thrive in the real world. Customers trust our software to help ensure the integrity of their products and drive business success through innovation.

Industry Leading Low-Frequency Electromagnetic Field Simulation

Trusted simulation of low-frequency electromagnetic fields in industrial components that includes 3D/2D magnetic transient, AC electromagnetic, magnetostatic, electrostatic, DC conduction and electric transient solvers to accurately solve for field parameters including force, torque, capacitance, inductance, resistance and impedance.

High-Performance Design Delivery

Customizable modeling capabilities, automatic adaptive meshing and advanced high-performance computing technology allows designers to solve complete high-performance electromechanical power systems.

High Fidelity, Model-Based Design

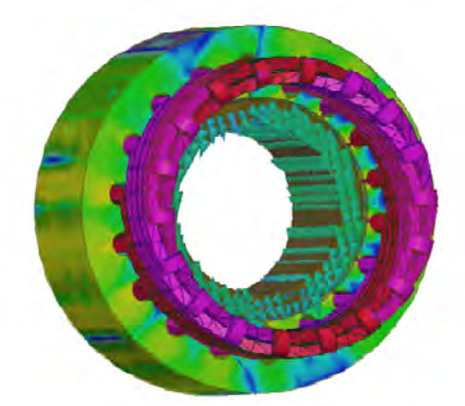
Automatically generate nonlinear equivalent circuits and frequency-dependent state-space models from field parameters that may be further used in system and circuit simulation to achieve the highest possible fidelity on SIL (software-in-the-loop) and HIL (hardware-in-the-loop) systems.

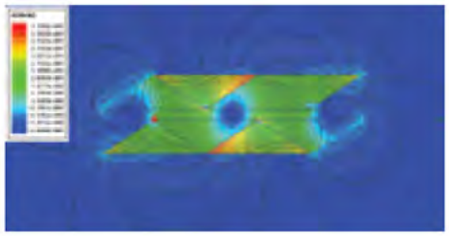
General Solver Capabilities

- Static Electromagnetic Fields.
- Adaptive Field Mesh.
- Frequency Domain.
- Magnetic and Electric Time Domain.
- HPC Frequency Sweeps.

Magnetic Transient with Rigid Motion

- Dynamic Effects on Rigid Motion with Symmetrical Field Conditions.
- Non-Cylindrical Motion.
- Advanced Embedded Circuit Coupling.
- External Circuit Coupling with Adaptive Time Stepping.





Correlated Magnetics Research investigated precise and rapid magnetization of materials a small volume at a time to produce higher torque-transfer performance from smaller, lighter magnets.

Using Maxwell along with Ansys Fluent® CFD software, Indar Electric developed a generator with a high efficiency rating in less than half the time that would have been required using conventional build-and-test methods.

/ Advanced Material Modeling

- Vector Hysteresis Modeling.
- Nonlinear Anisotropic Modeling.
- Functional Magnetization Direction.
- Magnetization/De-magnetization Modeling.
- Temperature-Dependent De-magnetization Modeling.
- Time and Frequency Dependent Core Loss Modeling.
- Dynamic Effects in Laminated Magnetic Materials.

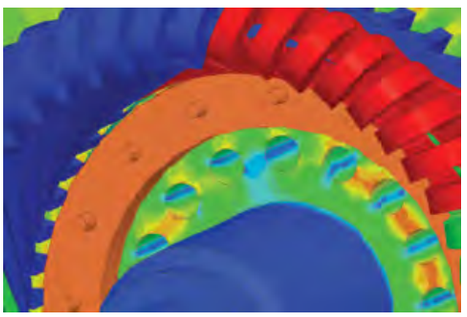
/ Multiphysics

- Magneto-Vibro-Acoustic coupling for rotating and non-rotating electromechanical design.
- Magneto-Stress coupling based on electromagnetic force and deformed mesh feedback.
- Electromagnetic-Thermal couplings with power loss and temperature feedback on Heat Transfer by Conduction, Convection and Radiation.
- Magneto-Thermal-Stress on Drive Design Life Cycle.
- Coupling with CFD based on power loss-temperature feedback.
- Coupling with CFD based on magnetic field, power loss and electric conductivity temperature for arc/plasma device design.

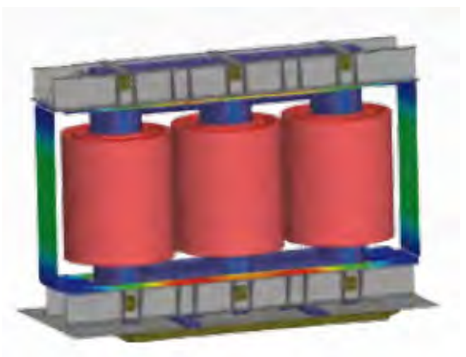
/ Multi-Domain System Capabilities

- Frequency Dependent Reduced Order Models and Nonlinear Equivalent Circuits from FEA analysis.
- Automatic Generation of the External Circuit and Electrical Machine Reduced Order Model for Model-Based Design (SIL and HIL).
- State-Space Reduced Order Models from Field Parameters.
- Frequency Dependent Models and S-,Y-, Z-, Parameters for Conductive EMI/EMC analysis.

Ansys Multiphysics solutions help cross-functional engineering organizations predict the performance of complex products influenced by multiple physics and improve their designs through simulations of the interactions between physics.



Engineers at WEG Equipamentos Elétricos S.A., Brazil, used Maxwell in a multiphysics simulation to optimize the trade-off between fan losses and electromagnetic performance in its new line of electric motors.



Pennsylvania Transformer Technology, Inc. performed multiphysics simulations using Maxwell, Ansys Mechanical and Ansys CFD to design next-generation transformers for the utility power industry.

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