



COILS & WINDINGS DESIGN

2D/RS and 3D Coils & Windings Editor

Are you designing complex electromagnetic equipment and...?

- Analyzing large number of coils and rotational transients or highly non-linear switching sources and loads,
- Measuring electromagnetic fields on curved or bent surfaces of a device,
- Finding an inexpensive way to manufacture, high level of safety and low level of maintenance for an electromagnetic device,
- Discovering technology to explore the effect of hidden factors on product design, beyond the traditional multiphysics approach.

Are you looking for a CAE software offering a perfect blend of tools to...?

- Define a set of coils wound onto the device, number of turns in a defined area and limited by the gauge of a wire, and multi-phase systems with delta/star connections,
- Analyze resistive and inductive requirements, eddy currents and proximity effects,
- Couple series and parallel connections with additional circuit elements,
- Identify a set of coils, attach them with the right polarity and assign them to a winding with the required source while designing motors, transformers, sensors and many other devices,
- Determine true resistance and impedance under high frequency conditions,
- Find ways to omit secondary features in order to produce a model which is feasible for solution in a reasonable amount of time,
- Avoid inefficient and expensive trial and prototyping and improving product design.

ADVANTAGES OF BEM

- One can attain very high accuracy for fields because they are calculated **by integration**.
- The problem doesn't have to be artificially truncated, nor does a boundary condition need to be applied to the artificial boundary.
- For linear problems, unknowns are located only on boundaries of the problem. This radically reduces mesh generation time and storage requirements.

WHY INTEGRATED?

- INTEGRATED has “**Best of Breed**” tools that cover the range of physical systems involving magnetic, electric and high frequency fields as well as transient and eddy currents.
- Going beyond traditional multiphysics approach, INTEGRATED's “**Coils and Windings Editor**” is the latest innovation to facilitate AC motor design.
- Only INTEGRATED has the advantage of having both the **Boundary Element Method (BEM) and the Finite Element Method (FEM)**. This hybrid approach uses the strength of each method while designing a sensor system.
- Designs can be optimized successfully using API, Parametric and/or Scripting capabilities

All INTEGRATED programs provide **complete solutions**.

Parametric provides an easy to learn GUI based method of testing sensors through their range of operating conditions, as well as modifying basic designs to obtain optimum performance.

The **INTEGRATED API** enables the direct control of program functions by utility scripts or macros created in tools such as EXCEL and Visual Studio. Scripting can control the entire process of model creation and testing.

- Direct import of models from CAD Partners including: Autodesk, PTC, Solid Edge and SolidWorks.

MORE BENEFITS:

- Efficient multi-threading/parallelization for speed
- High resolution graphic representations
- Automatic meshing and removal of intersecting geometries
- World class support team ready to unlock your ideas

SOFTWARE THAT LIVES UP TO THE POWER OF YOUR IDEAS

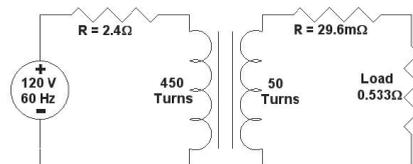
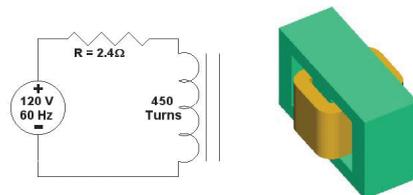
Electromagnetic simulation using time varying voltage sources

Ultimately, magnetic fields are produced by electric currents, but the majority of physical systems are driven by voltage excitation. Because of this, the determination of electric currents in coils adds another level of unknowns to the simulation of systems energized by time varying voltage sources.

INTEGRATED provides a direct solution for this class of problems through the definition of windings composed of coils and voltage signals.

In the simplest example, the current drawn by an iron core inductor will be primarily determined by its reactance at the source frequency.

Adding a secondary winding produces a complete transformer system. Here again, calculation of the primary and secondary currents will depend on operating frequency and load conditions.



Putting all these factors together clearly demonstrates the need for a simulation to handle multiple scenarios. In addition, the Graphical User Interface (GUI) provides a level of sophistication that makes defining these coils simple. Subsequently, the coils need to be grouped to form windings for which a wide variety of voltage or current sources can be defined (static, time harmonic or transient).

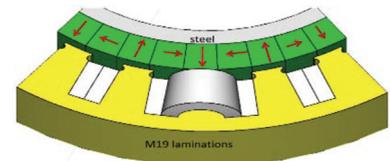
INTEGRATED Engineering Software has met this challenge with a coil and winding editor for two dimensional, rotationally symmetric and full three dimensional models

Coils with arbitrary shaped cross sections can be modelled with very good accuracy.

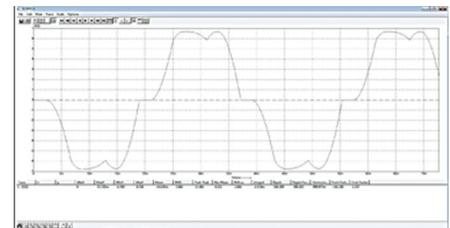
“We rely on MAGNETO to design many varieties of permanent magnet and electromagnetic devices. We have found good correlation between model prediction and measurements on final products. We especially like how easy it is to create/modify geometry, how quickly the self-adaptive solver converges and the ability to solve parametrically.”

—Michael Devine
Applications Engineering Manager, Dexter Magnetic Technologies, Inc., USA

Simulation of motors and generators can be especially challenging not only because of the large number of coils and rotational transients, but also because of the highly nonlinear switching sources and loads.



For these cases, INTEGRATED partners with **CASPOC**, a system simulator to model dynamic performance for a complete systems solution. Below, current through one phase with time, 66 ohm load, 150 rpm rotation.



PUT OUR SOFTWARE TO THE TEST

Don't take our word for it, send us your model, whatever the level of complexity. **We will show you how to get results from your exact design** – no packaged demos.

Contact us for an evaluation and start improving productivity today. A live demo is also available.