Altair FluxMotor™
Rotating Electric Motor Design

Altair FluxMotor is a flexible open software tool dedicated to the pre-design of electric rotating machines. It enables the user to build a machine from standard or customized parts, add windings and materials to run a selection of tests and compare results.

Product Highlights

- Dedicated to electric rotating motor design
- Rapidity of design
- A user-oriented winding tool
- Automated tests and reports allowing quick evaluation of machine efficiency
- Fast analysis with good accuracy
- Effective machine parts management (slots, bars, magnet shapes, etc.) with customizations
- An innovative catalog project management

Learn more:
altair.com/fluxmotor

Based on modern technology, Altair FluxMotor is a fast and accurate tool for electric rotating motors' pre-design. When necessary, connection with Altair Flux™ finite element software enables more advanced studies, taking into account more complex phenomenon.

Benefits

High Productivity Gain
- Efficient working environment
- Create a model of an electric motor and evaluate it within a few minutes
- The technical-economic potential of an electric motor pre-design can be quickly understood, offering a high gain of productivity when modeling electric rotating machines
- Better visualization of machine performance ensures accurate choices

A Broad Range of Users
- Technicians, engineers or researchers
- From designers and manufacturers to integrators, maintenance and training staff

Fulfill All the Design Tasks
- Whatever the level of use: beginner, intermediate or expert
- Whatever the task: from selection or pre-design of motors to evaluation of performance

Fast and Accurate
- Based on optimization technology, FluxMotor helps reduce computing time to the minimum
- The computations are based on 35 years of Flux experience, insuring accurate results
- Settings adapted to the task – levels of accuracy vs. speed
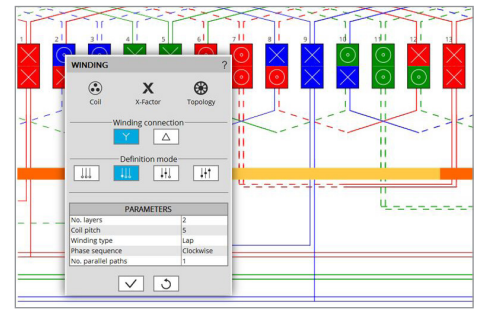
Connection for Advanced Studies
- Easy Flux project export to perform advanced studies like eccentricity, vibro-accoustic, etc.
- At any time, the full parameterized Flux project, with all the physical properties embedded, is ready to be solved in the Flux environment
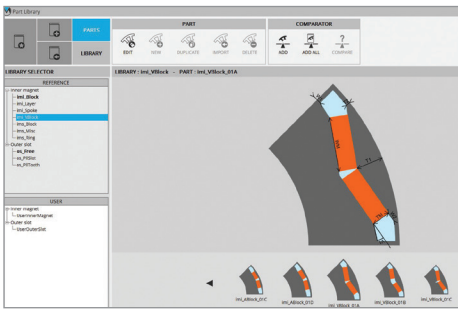
Part library
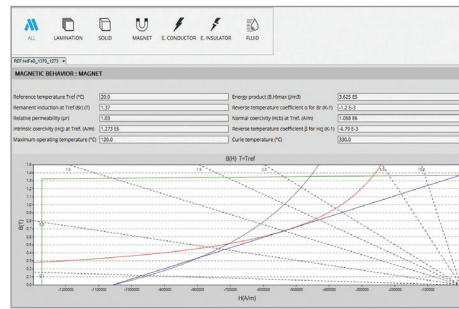
Material database

Winding tool

Capabilities

Designing Electric Motors
• Synchronous machine with permanent magnets - Inner and outer rotor
• Induction machine with squirrel cage. Inner or outer rotor, with slot or bar skewing
• A straightforward coupling with Altair HyperStudy™ for optimizing the machine performance and topology

User-oriented Winding Tool
• Offering 4 different winding modes (automatic, easy, advanced, and expert levels), the winding area is designed to help users find the right winding architecture
• Settings are well adapted to the task
• An automatic diagnostic is issued to evaluate the quality criteria of the winding. This helps users find the right winding parameters

A Comprehensive and Scalable Material Database
• A large selection of typical materials is provided: lamination, magnet, electric conductor, electric insulator, etc.
• Users can manage their own materials
• Easy way to define B(H) curve or iron losses parameters

Effective Machines Part Management
• In the Part Library area, libraries are provided with standard parts
• Many slots, bars or magnets are available
• All the topologies are parameterized

Customization of Parts
• Parts can be edited and customized for unlimited configurations
• Parts can be designed from a sketcher

Powerful Project Management
Motor Catalog environment allows easy management of motors and projects.
• Access past studies quickly
• Manage full range of products
• Quick performance maping and ranking

Testing and Evaluating Electric Motors
• FluxMotor's dedicated test environment enables users to assess motor performance
• Standard and relevant test portfolio available
• Predefined tests ready to be performed
• Relevant input parameters allow users to control the test conditions
• Processes based on optimization technology
• Results are automatically illustrated

List of Automated Tests Ready to be Performed
• Open circuit tests with cogging torque and back-emf
• Maps vs (I_d, I_q): Flux, inductance, torque, iron losses, etc.
• Data sheet present comprehensive synthesis of machine performance
• Working point computations with sine wave or square wave drive
• Performance mapping with efficiency maps

Getting a Report Automatically
• Description of all the achieved work for design and tests
• Export files for easy machine performance comparisons, in html or pdf format
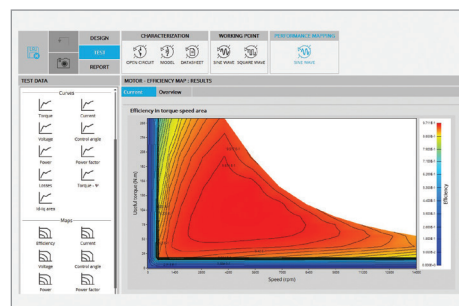
Computation of Performance Mapping
• Efficiency map & duty cycle
• Motor and generator mode

A Seamless Connection to Go Further
Flux models ready to be solved and analyzed can be generated within seconds. Thanks to this connection to Flux finite element electromagnetic and thermal simulation software, advanced studies – like eccentricity, vibro-accoustic, advanced drive and control strategies, etc. - can be launched

Efficiency map

Back-emf results

Motor catalog with comparator