

# MotorSolve

Electric Motor Design Software

MotorSolve version 6 is the complete design and analysis software for permanent magnet, induction, synchronous, electronically and brush-commutated machines.

Motor and generator designers can use this template-based software for quick and easy virtual prototyping.

MotorSolve simulates machine performance using equivalent circuit and our unique automated finite element analysis engine. Typical FEA user controls such as mesh refinements are not required as MotorSolve performs these operations for the user.

## Machine Types:

### Brushless DC & PMAC machines

- Sync. Reluctance
- IPM
- Surface
- Bread-loaf
- Spoke
- Inset
- More

### Induction machines

- Interior and exterior rotors
- All standard bar shapes
- All standard wound configurations

### Brushed & Wound field DC machines

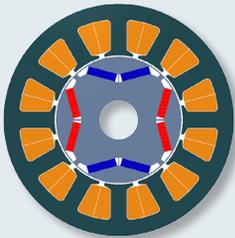
- Brushes
- PMDC
- Series
- Shunt
- Universal
- More

### Switched reluctance machines

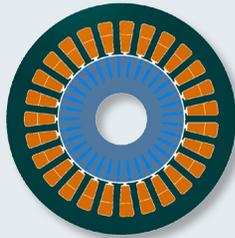
Templates for both interior and exterior types.

### Thermal

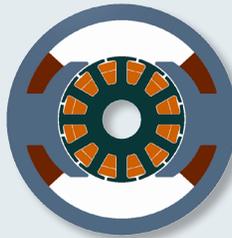
- Non-vented (TENV)
- Forced Cooling (TEFC)
- Contact cooling
- Spray cooling
- Duct cooling + Water Jackets



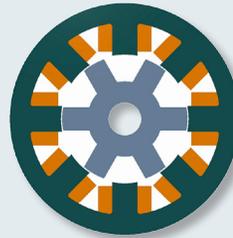
BLDC module



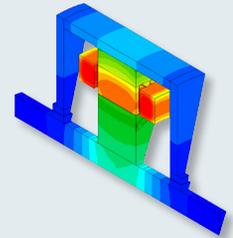
IM module



DCM module



SRM module



Thermal Analysis

MotorSolve BLDC supports AC generators or generating mode analysis. Any electrical machine in the BLDC module can be simulated in motor mode or generator mode, depending on the operating condition.

### Output Waveforms & Charts

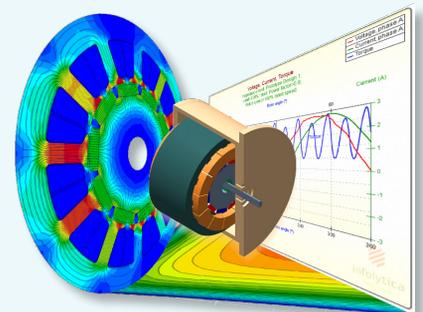
- Current
- Back-EMF
- Torque
- Flux Linkage
- Duty Cycle losses
- Heat flux
- Heat capacity
- Phasor Diagrams
- And many more

### Machine Performance

- Torque
- Efficiency
- Air Gap Flux
- Cogging Torque
- Efficiency Maps
- And many more

### Field Plots

- Demagnetization prediction
- Losses
- Flux density
- Current density
- Thermal
- Surface Force Density
- And many more



# MotorSolve

Electric Motor Design Software

## Other Features Include

- Automatically calculates list of all balanced windings
- Auto-size: Get an initial value for several parameters related to the size of the machine based on torque per unit volume or rated current density
- Take notes and document design changes
- DXF Import of the rotor, stator, and armature geometry
- VHDL-AMS and Simulink® export capabilities
- Export results into your spreadsheet
- Create multiple design alternates in the same model to do quick and easy performance comparisons
- Pre-defined library of linear, nonlinear and anisotropic materials
- Several winding diagrams available (Phase Back-EM, Winding factors, Görges diagram, Animated Airgap MMF, etc)

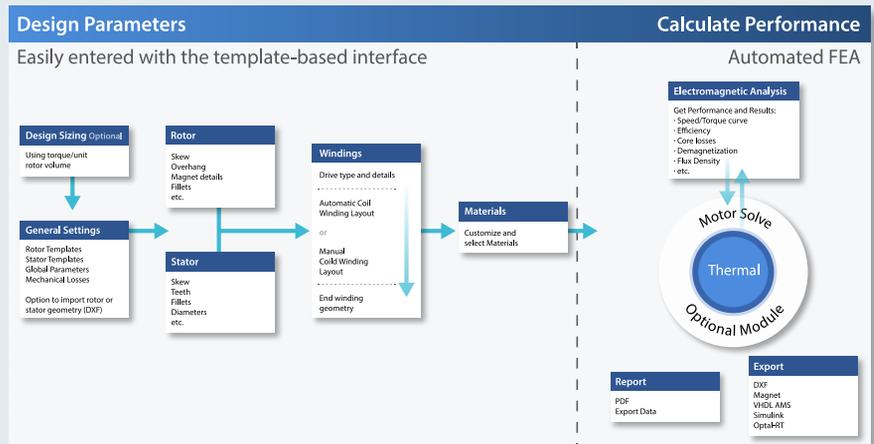
## Automated FEA Engine

MotorSolve includes several analysis methods, suitable for different phases of the design process. Outputs quantities, waveforms, fields and charts can be based on different analysis methods, allowing users to choose the computation time based on their required degree of accuracy.

Only FEA simulations accurately predict:

- Performance when there is saturation
- Hysteresis, eddy current & winding loss
- Deep bar effects
- Coupled Electromagnetic and Thermal effects

Performance parameters, waveforms and field plots are available with just one click.



## MotorSolve Thermal

MotorSolve Thermal is a 3D FEA-based thermal analysis tool for calculating the steady-state temperatures using the losses from BLDC or IM's electromagnetic analysis and perform the electromagnetic analyses at these steady-state temperatures.

## Export

- DXF
- VHDL-AMS
- Simulink®
- eDrivesim from Opal-RT
- FloMASTER

## Scripting

Powerful scripting capability for customization, batching and optimization possible: All MotorSolve commands can be accessed through APIs. Use this feature with any programming language or any ActiveX compliant application, (e.g. Microsoft Excel)

If you would like to learn more about MotorSolve, visit our website for the latest product information and application examples.

Contact us to request a web demonstration or a trial copy of MotorSolve today.

