

SPEED Software

The SPEED programs for electric motor design are simple to use, fast and efficient.

They are intended for:

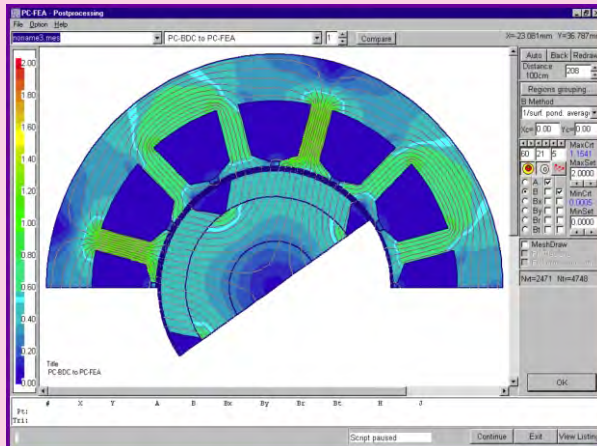
1. Sizing and preliminary design
2. Studying the performance and quickly assessing the effect of parameter changes.

The programs include several common features:

1. Graphical outline editor for shaping and sizing the lamination and the axial dimensions
2. Template editor for non-geometric parameters
3. Performance analysis including the electronic controller
4. Output of numerical data, graphs and waveforms
5. Utilities such as material databases, links to finite-element software and winding editors.

Motor design done with SPEED software is interactive and fast. However, SPEED does not do the engineer's job. It has no judgement and it is not automatic. It is a specialised calculating tools to assist the motor designer.

SPEED software is backed by over a decade of experience within the SPEED Lab. at the University of Glasgow. Several hundreds of new motor designs have been developed with SPEED, many of them at the leading edge of electric motor development and application.



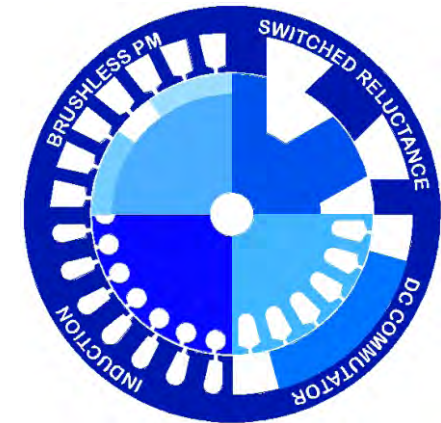
UNIVERSITY
of
GLASGOW

SPEED was developed by the
SPEED Laboratory
at the University of Glasgow, GB.

It is distributed and supported in Central,
Eastern & Northern Europe
as well as parts of Asia by:

MACCON GmbH
Aschauer Str. 21
D-81549 Munich
Tel. +49 89 651220-0
Fax. +49 89 655217
Email: software@maccon.de

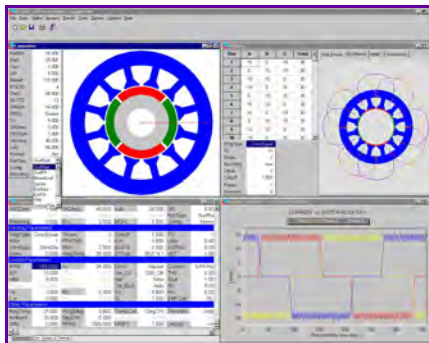
MACCON
MOTION UNDER CONTROL



PC-BDC

Brushless permanent magnet motors and their controls—

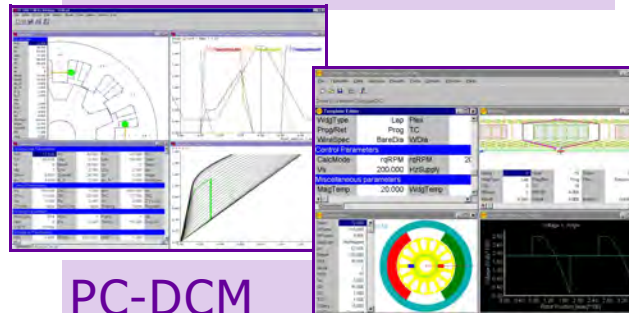
- Efficient user interface
- Manual with extensive technical appendix
- Graphical outline editor; template editor
- Output design sheet with over 200 output parameters
- Several controller models including sinewave, squarewave and AC Volts drive options
- Fast magnetic circuit calculation
- Can losses calculations
Magnet losses due to tooth-ripple effects on open-circuit
- Back-EMF detection waveforms for sensorless operation
- 9 standard rotor types
- Winding editor: 4 standard winding types, plus complete custom, automatic “winding” of fractional-slot windings
- Approximate airgap winding calculations
- Harmonic analysis of waveforms
- Finite element link
- Steel & magnet databases
- Injection of current harmonics
- Converter switching losses
- Balanced operation as a capacitor split-phase motor from the AC line
- Phase self- and mutual inductances and synchronous reactances
- Simulation includes current, EMF and torque waveforms
- Alt+1, Alt+2... instant display of standard designs.



PC-SRD

Switched reluctance motors and their controls—

- Efficient user interface
- Manual with extensive technical appendix
- Graphical outline editor; template editor
- Output design sheet with over 100 output parameters
- Automatic calc. of magnetisation curves from geometry
- Calc. of current and torque waveforms; energy conversion loop
- Calc. of torque, efficiency, currents in windings, controller transistors & diodes and loss breakdown
- External mag.curve import/export facility
- Finite-element link
- Range of control options e.g. current regulation
- Normal/short fluxpaths; Single phase
- Ranging (batch design); database for steels
- Alt+1, Alt+2... instant display of standard designs



PC-DCM

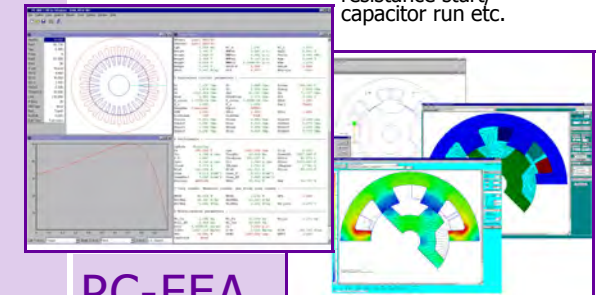
Permanent-magnet DC commutator motors and their controls—

- Efficient user interface
- Manual with extensive technical appendix
- Graphical outline editor; Template editor
- Output design sheet with over 150 output parameters
- Calc. of torque, efficiency, current, current & torque waveforms, weights, inertia
- Four slot shapes
- Winding types: Lap, wave, progressive, retrogressive
- Databases for steels, magnets, brushes
- Torque/speed characteristics
- Drive with DC volts, semi-converter, full converter, chopper

PC-IMD

Split-phase and 3-phase induction motors—

- Efficient user interface
- Manual with extensive technical appendix
- Graphical outline editor; Template editor
- Output design sheet with over 180 output parameters
- Design sheet calculator
- 12 fully-editable rotor slot types
- Winding editor; Speed/torque characteristic
- Dynamic simulation (line-start calc.)
- Equivalent circuit editor; Phasor diagram
- Calc. of torque, efficiency, power factor, current, and equiv. Circuit parameters at any value of slip
- Deep bar effect
- Calc. of saturation of leakage and magnetising reactances
- Split-phase motors: capacitor-start/capacitor run, permanent split capacitor motors, resistance start/capacitor run etc.



PC-FEA

Finite Element engine tightly integrated with SPEED motor design programs—

- Geometry input directly from the SPEED motor design software giving instant access to more than 200 basic motor configurations including switched reluctance, PM brushless DC and induction motors
- Automatic mesh generator with concentration of nodes under user's control
- Ultra-fast magnetostatic solver optimised for electrical machine problems
- Graphical and numerical magnetic field distribution
- “Push-button” calculation of motor parameters and performance.