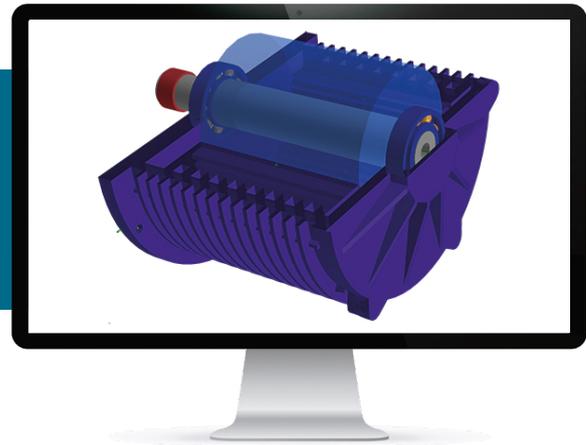


# Romax Evolve

## Electro-mechanical analysis tool for electrical machine designers



Electrical machine technology is moving fast, as the drive for electrification challenges machine designers to achieve higher torque densities and higher speeds. Engineers need reliable tools not only to conduct electromagnetic analysis, but also perform structural analysis, whether they are considering the machine in isolation, or as part of a complete system. Whilst pushing for innovation in this area, a foundation of expertise is essential.

Romax have a proven track record in electro-mechanical simulation and design, rotor dynamic simulation for industrial generators and electrical machine NVH capability. Romax Evolve incorporates this expertise into application-specific tools for the structural design and analysis of electrical machines, which integrate into powerful multi-fidelity full system analysis.

### Benefits

- Application-specific - dedicated tools for essential structural and NVH analysis of electrical machines
- Trusted expertise - Romax Evolve brings Romax's proven capability in electro-mechanical system analysis to the electrical machine designer
- Interfaces and workflows - to major electromagnetic packages means that Romax Evolve complements and enhances your existing tool chain



**We have created a promising powertrain concept, offering high efficiency in both electric and hybrid driving, good driving performance, and simple transmission technology. All design and efficiency calculations, as well as modelling and simulations, were done using Romax."**

Technische Universität Darmstadt

## Romax Evolve: multi-fidelity tools for electrical machine design and analysis, from initial studies through to validation with test data

### Model build:

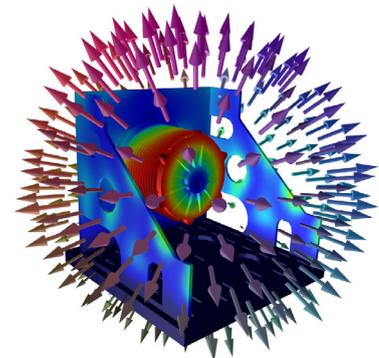
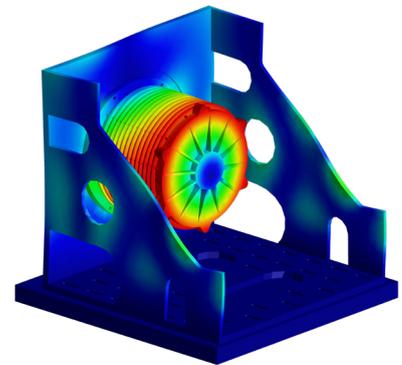
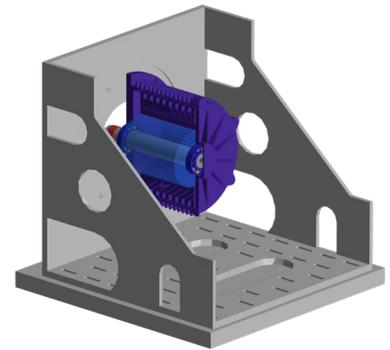
- Parameterised model builds for rapid structural modelling.
- Comprehensive bearing catalogues.
- Create, import and condense FE housing components.
- Import/export geometry with leading CAD tools.
- Import motor efficiency map.
- Interfaces to electromagnetic FE software packages for electrical machine geometry and excitation import.

### Analysis:

- Fast static analysis of electrical machine housing and shaft deflections.
- Evaluate bearings for durability.
- Evaluate motor efficiency and energy consumption considering bearing, seal and electromagnetic loss mechanisms.
- Calculate rotor-dynamic behaviour of rotor shaft system.
- Capture the effects of UMP on static and dynamic behaviour.
- NVH analysis of electrical machine including electro-mechanical excitation sources and rotor mechanical imbalance.
- Embedded acoustic solver brings complex simulation of radiated noise to the non-expert.

### Applications:

- CAE led design - consider structural and NVH performance from the early stages to prevent problems before they arise.
- Support the design process from initial structural concept through to detailed housing design, test planning, and validation.
- Sits alongside other Romax products as part of a comprehensive toolchain for component and system-level analysis.



Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Romax, part of Hexagon's Manufacturing Intelligence division, provides world-leading solutions for the design, analysis, testing and manufacture of gearboxes, drivetrains and bearings. Learn more at [romaxtech.com](https://romaxtech.com). Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter.

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