

# Romax

## Improves Reckon Drive Product Reliability with Drivetrain Structural Simulation Software

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The shift towards electric drivetrains has created unprecedented demand for new transmission architectures across numerous vehicle platforms at a time when subject matter expertise is at a premium. When developing new transmission designs, meeting durability targets is almost always the number one priority. However, it is, naturally, not the only important performance attribute that must be met. Durability requirements must be balanced with the need for light-weight and low-cost solutions which meet noise and vibration targets whilst also exhibiting excellent efficiency.

### Predicting Product Behavior

Reckon Drives, headquartered in St. Etienne, France, designs and manufactures helical and spur servo-grade planetary gearboxes for various kinds of applications, for laser cutting, packaging, printing machines or machine tools.

Previously, it has been difficult for Reckon to show their customers precisely how their products will behave in each application. However, predicting this is crucial for building confidence in the robustness of a design.

For many years, Romax Technology, headquartered in Nottingham in the U.K., has delivered CAE tools which enable simulation-led design. Building on *RomaxDesigner*, *Romax Enduro* is a new tool aimed primarily at drivetrain durability engineers. It is a sophisticated, yet easy-to-use structural design, analysis and optimization solution for the development of Right First Time, durable electro-mechanical drivetrain systems.

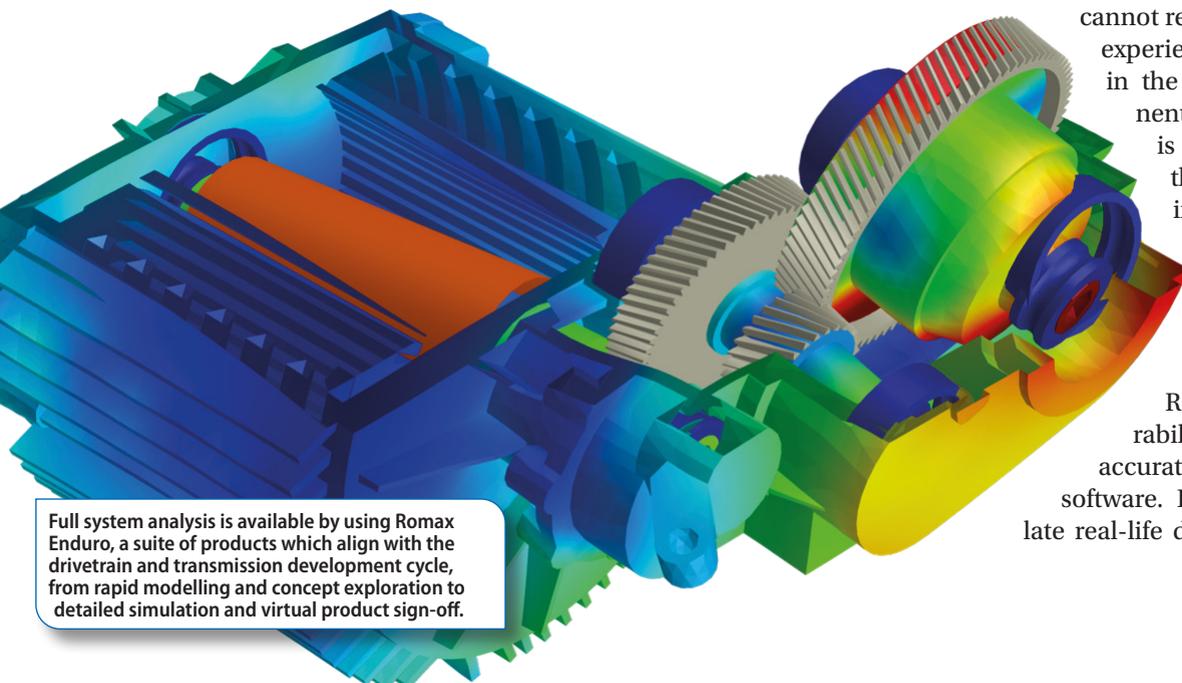


The Ultimate series from Reckon are used in highly dynamic applications. Product recommendation requires safe application engineering and is performed using Romax.

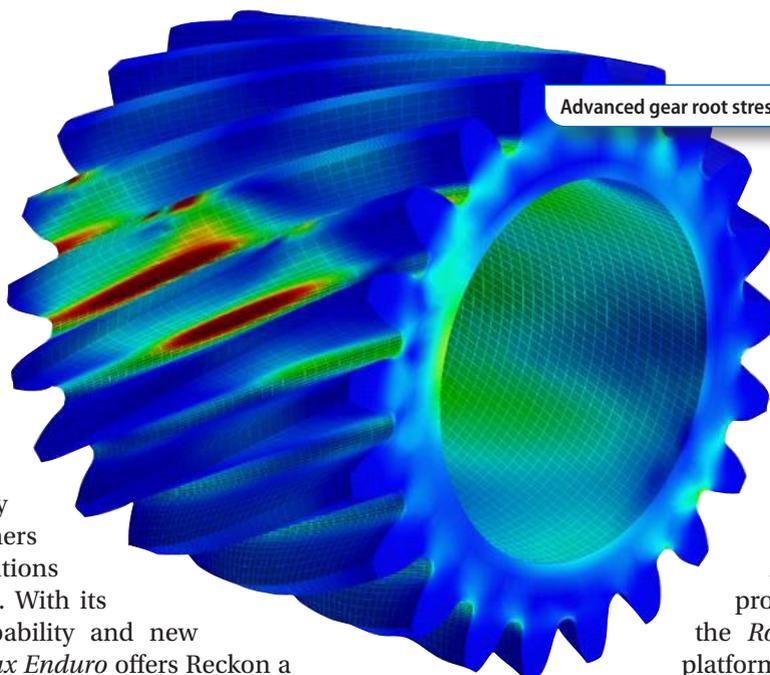
*Romax Enduro* allows users to understand the interactions between components in the system by incorporating advanced component contact models within a whole system structural analysis, predicting loads and misalignments and component stresses and life within a single tool. It gives insight into the behavior of the system, meaning that if a component fails then the root cause can be easily identified, and remedial design changes can be developed and tested in a virtual environment.

This is particularly important for new drivetrain architectures and applications—designers cannot rely on prior knowledge or experience to give confidence in the architecture or component sizing. Where weight is a concern and where there is flexibility of housings, shafts and carriers, *Romax Enduro* can give the required level of modelling detail and results' accuracy.

Using *Romax Enduro*, Reckon can predict the durability of their products more accurately than with any other software. It allows them to simulate real-life duty cycles and optimize



Full system analysis is available by using Romax Enduro, a suite of products which align with the drivetrain and transmission development cycle, from rapid modelling and concept exploration to detailed simulation and virtual product sign-off.



Advanced gear root stress analysis in Romax Enduro.

gearbox designs, giving Reckon confidence in the suitability of their product for a specific customer application. It enables them to quickly and clearly demonstrate to their customers the benefits of Reckon solutions over competitors' products. With its full-system simulation capability and new easy-to-use interface, *Romax Enduro* offers Reckon a proven solution that was once affordable only to large OEMs and Tier 1 suppliers.

"*Romax Enduro* takes so many parameters into consideration. It's easy to use, fast and really safe and that's reassuring for our customers," said Martin Mijno, CEO at Reckon Drives. "With this software we can see where the weak points are in our design and make them stronger by revealing the truth of what's happening within the gearbox. Using *Romax Enduro*, Reckon is able to make precise and professional client recommendations. From a customer point of view, sizing a gearbox using standard catalogs is increasingly seen as unprecise and risky, and a growing number of engineers are beginning to challenge datasheet values. Many suppliers from Europe or Asia understood that customer engineers prefer selecting gearboxes having a high torque rating, so they have modified their catalogs with higher ratings for the same products. We want to go the other way around and offer superior safety by proving that our torque ratings are the safest."

### Lifetime and Performance Simulation

Ensuring durability performance without exclusively relying on expensive physical testing means simulation is key. Being able to create a detailed structural analysis of virtually any drivetrain, analyze its durability performance, and make changes where required, allows users to realize an optimal design whilst reducing the need for prototyping.

One option is to use a combination of finite element tools to predict loads and misalignments (which can be an extremely time-consuming process) and component specific tools for analysis and ratings. However, these simulations are not coupled together, which means important component interactions aren't captured.

Productivity and quality can also be negatively affected as two copies of the model have to be built and subsequent changes replicated manually. Furthermore, whilst

component specific tools may offer a wide range of rating standards, they do not provide the required level of sophistication and structural analysis.

*Romax Enduro* is one of six products recently launched on the *Romax Nexus* platform. The platform comprises a suite of products which align with the drivetrain and transmission development cycle, from rapid

modelling and concept exploration to detailed simulation and virtual product sign-off. The flexible products use workflow-oriented environments and seamlessly blend desktop and cloud technologies. All products work seamlessly together, which offers a level of process integration that enables true multi-attribute optimization via repeatable, automatable processes. Customers are using *Romax Nexus* products to achieve their development goals in the design of next generation propulsion systems, and exceed their targets for durability, efficiency, and NVH in cost-effective fashion.

*Romax Enduro's* customers particularly value its speed and trustworthiness, and rely on its wide-ranging features, including internal FE meshing, highly intelligent CAD integration, and powerful ability to handle large duty cycles. Reckon Drives has been impressed with the capability it brings in optimizing their design and development.

"*Romax* goes further and works with the most respected experts around the world to develop their own additional algorithms for bearing calculations. Because even the greatest products cannot perform if poorly sized, Reckon engineers use *Romax Enduro* to give our customers the perfect recommendation, so their application achieves the longest lifetime and the best performance," Martin Mijno said. **PTE**

### For more information:

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