



HEXAGON



Romax
TECHNOLOGY



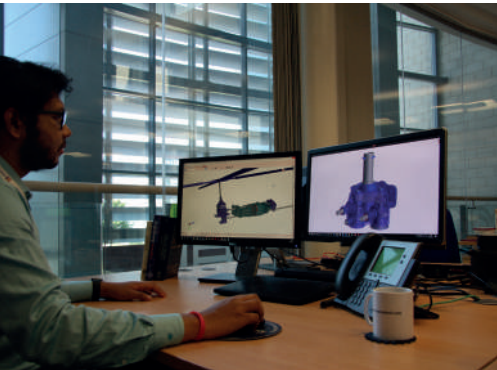
RomaxAERO

ROTORCRAFT



CONSULTANCY AND SIMULATION

SAFETY



Romax Technology offers a unique blend of world-leading simulation software and consultancy services, led by a team of industry experts.

Romax Consultancy

With a proven track record in the aerospace industry, Romax Technology can support or lead projects from concept design and system troubleshooting to technical due diligence, root cause analysis, and manufacturability.

RELIABILITY



From Concept to Certification...

Romax Aero helps you to meet challenging industry targets whilst developing new and innovative solutions, across the product development cycle.

Innovation for the Future

Romax industry-leading R&D experts develop all of our aerospace products, delivering innovative technology, enhanced performance, and new levels of efficiency, to support a sustainable future.

PERFORMANCE





Romax
AERO
nexus

WITH DIGITAL CERTIFICATION



Romax

concept

Rapid and intuitive exploration of drivetrain ideas to enhance the early product development process



Romax

enduro

Trusted structural simulation and optimisation for the design and certification of durable and robust aerospace drivetrains



Romax

spectrum

Full system dynamic simulation from gear and electric machine design through to structural vibration and sound



Romax

energy

A global efficiency prediction tool for aerospace drivetrains



Romax

spin

Advanced simulation of rolling element bearings for bearing designers and application engineers



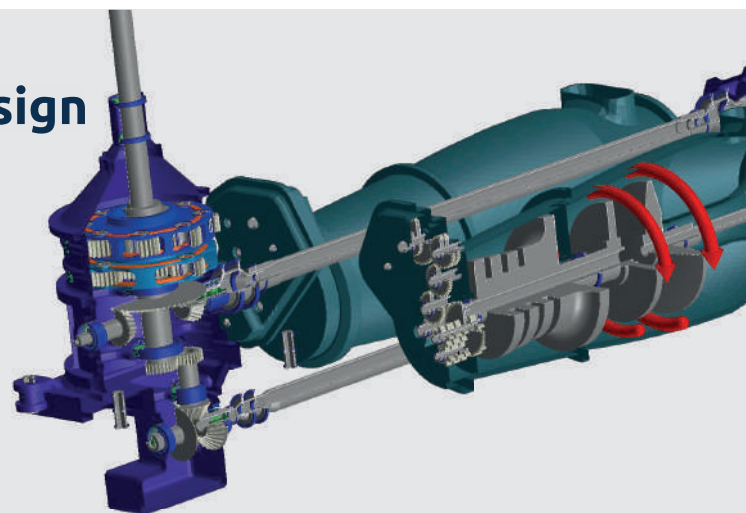
Romax

evolve

Electro-mechanical analysis tool for electrical machine designers

AIRWORTHINESS driven design

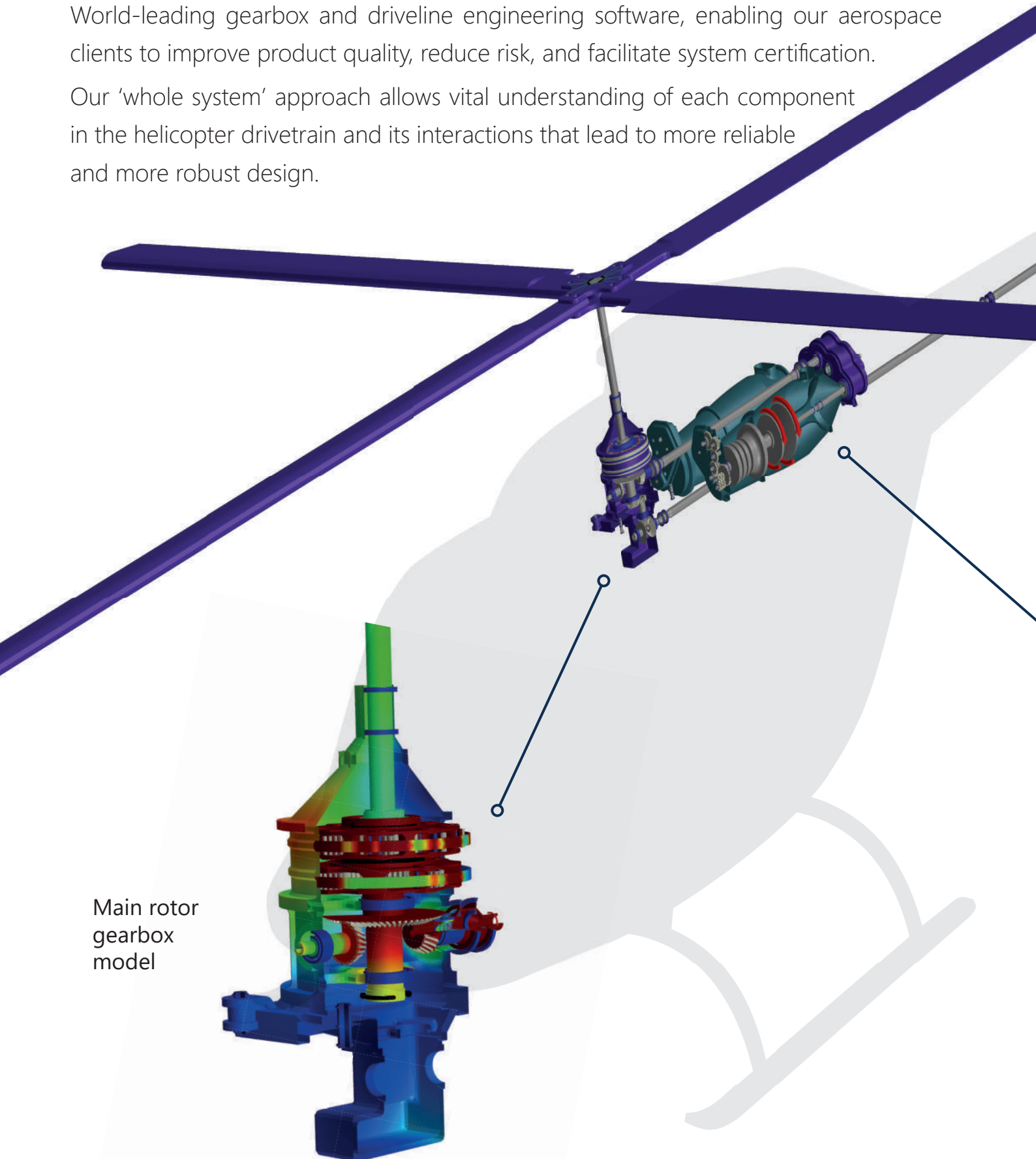
- ✓ **Digital certification**
- ✓ **Aerospace physics**
- ✓ **Extended TBO**
- ✓ **Expedite development**



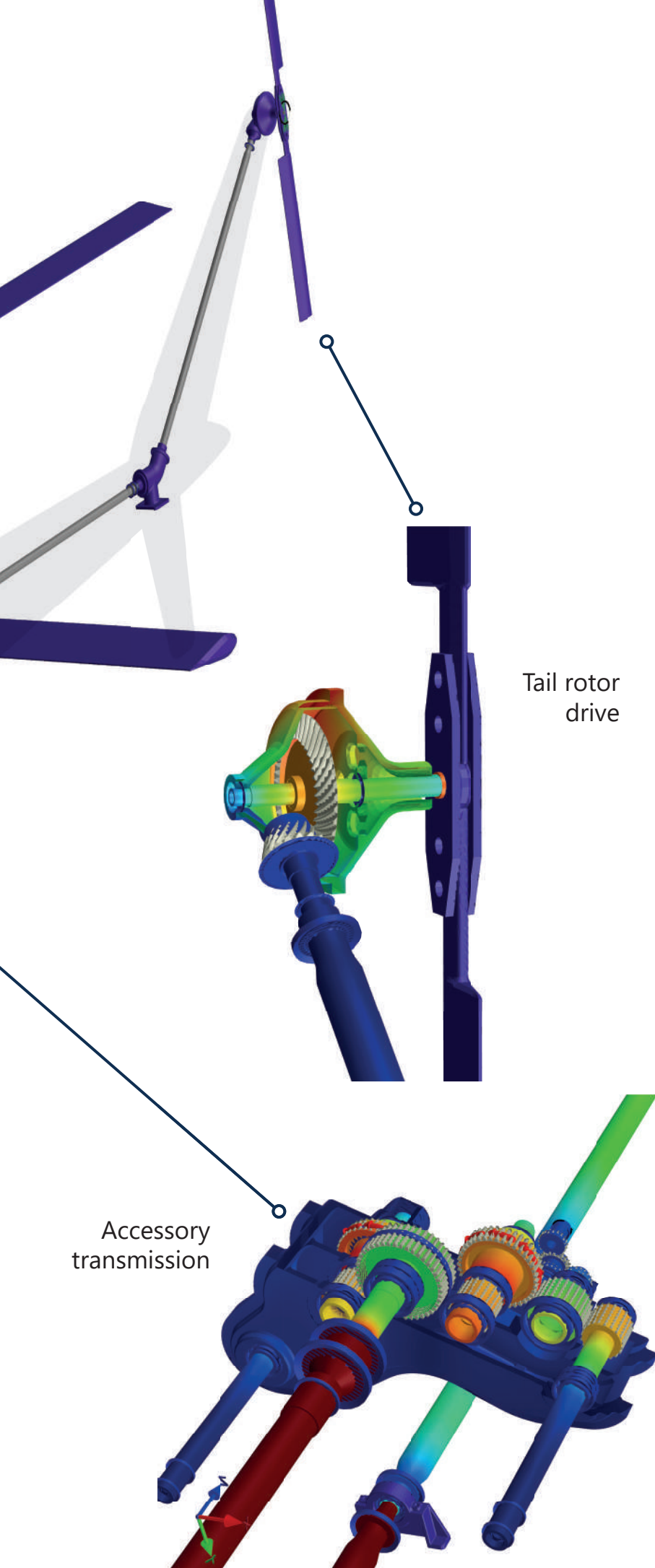
HELICOPTER COMPLETE DRIVETRAIN

World-leading gearbox and driveline engineering software, enabling our aerospace clients to improve product quality, reduce risk, and facilitate system certification.

Our 'whole system' approach allows vital understanding of each component in the helicopter drivetrain and its interactions that lead to more reliable and more robust design.



Main rotor
gearbox
model



INNOVATION

- Romax software has already led the automotive industry into electrification; now we're ready to lead our aerospace partners to the same success

SYSTEM UNDERSTANDING

- Model a whole system with all component interactions for understanding of system behaviour at a fundamental and detailed level
- Delivering insight and analyses throughout the design process

PERFORMANCE

- Achieve regulatory requirements to reduce noise, pollutants and fuel consumption with holistic simulation and optimisation for efficiency, noise and durability
- Providing sensitivity studies to assess tolerance effects

PRODUCTIVITY

- Suitable for every stage of the development process, from concept to detailed design, with varying levels of fidelity to appropriately balance speed and accuracy
- Integrates with the best third party tools for optimal, automated development processes

PRACTICAL APPLICATIONS AND SUCCESSES

Tilt Rotor

Demand for tilt rotorcraft is growing in the market, both for defence and civil applications. But it brings complexity due to the increased number of components and challenges in terms of weight/size. As the engines rotate in operation, lubrication systems need to take engine angle changes into account, alongside fuel and hydraulic flow. There are gearboxes in each nacelle to ensure that the engine output shaft speed matches the prop rotor speed, requiring up to five gearboxes to achieve this: two in each nacelle and one central transmission in the centre fuselage. The weight and size challenges are significantly greater than those faced by other rotorcraft. Romax has been proactively helping the industry select the optimal driveline design to maximise performance with minimal weight/size. Following successful implementation, its value was confirmed in the findings of a NASA-funded research study.



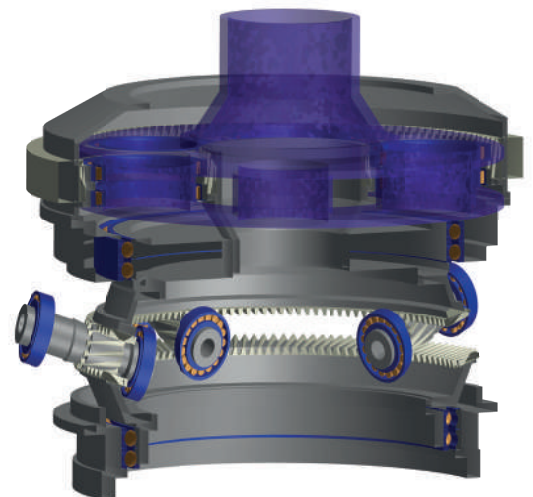
Helicopter Split-Torque Gearbox

Helicopter gearboxes with multiple load paths need to be designed to ensure equal load sharing. This can be achieved by setting the correct amount of backlash in the gear pairs to account for elastic deformation from torque application.

Consideration is required for deformation from gear tooth bending and contact, rolling bearings contact, gear shaft, gear blank and housing deflections. Accounting for all these factors is increasingly difficult with conventional FE tools.

Romax Aero Nexus is able to calculate the relative compliances of all the assembled components and deduce their relative deformations.

In one particular example, exhaustive parametric studies were performed to assess the percentage torque measured through one of the load paths. The results highlighted unequal load sharing closely matching findings from physical testing.





HUMS

Health monitoring is key to ensuring safety in rotorcraft. Romax has developed simulation-based prognostics to predict the performance and deterioration of the gear/bearing system by combining a digital model, simulation and measurement. This provides the operators with accurate insight over gear/bearing system behaviour, and enables them to predict damage. This allows the operator to accurately predict TBO and MTBUR, which saves cost and improves business performance.

Thermal and Structural Simulation

Romax Technology have developed a multi-physics and multi-fidelity simulation process for aerospace gearboxes, using a completely holistic engineering approach to gearbox analysis which combines thermal analysis with CFD analysis to understand the impact of thermal and high speed effects on gearbox loads, deflections, stress, fatigue and dynamics.

This involved investigating and developing multi fidelity thermal and fluid flow analysis techniques that maximise and accelerate Engineering understanding of thermal phenomena during the design and simulation process of aerospace gearboxes. In addition, existing dynamics capabilities were developed and enhanced through the inclusion of centrifugal and gyroscopic effects to fully represent high speed effects.

Aerospace Major OEMs

Youn Park, Global VP for Aerospace, comments: "At Romax we have a trusted track record when it comes to understanding and developing technologies which can optimise the design process. This is an incredibly exciting time for our aerospace business. We are providing major OEMs with our world-class solutions to enable faster, more accurate and cost-effectively designed aero engines."

Romax Aero

Romax Technology has worked with the aerospace industry since 1989, helping industry leaders solve challenging problems and reduce development lead-time in aerospace engines and rotorcraft drivetrains. Through a combination of experience and collaboration, Romax Technology has developed the Romax Aero nexus offering specifically to support aerospace applications. Romax Aero Nexus can help you optimise design and deliver improved performance for durability, safety and efficiency at a system level.

Along with condensed design times and reduced testing through simulation, Romax solutions reduce costs and the risk of drivetrain failures.



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