HEXAGON | Romax TECHNOLOGY

RomaxAERO

AEROSPACE ENGINES

Consultancy and Simulation

75% CO_2

90% NO_x

65% Noise

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.

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.

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

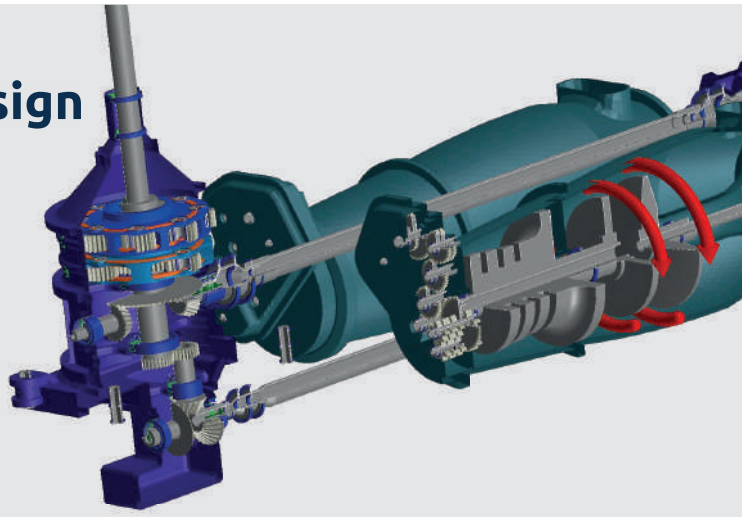
Advanced simulation of rolling element bearings for bearing designers and application engineers

Romax evolve

Electro-mechanical analysis tool for electrical machine designers

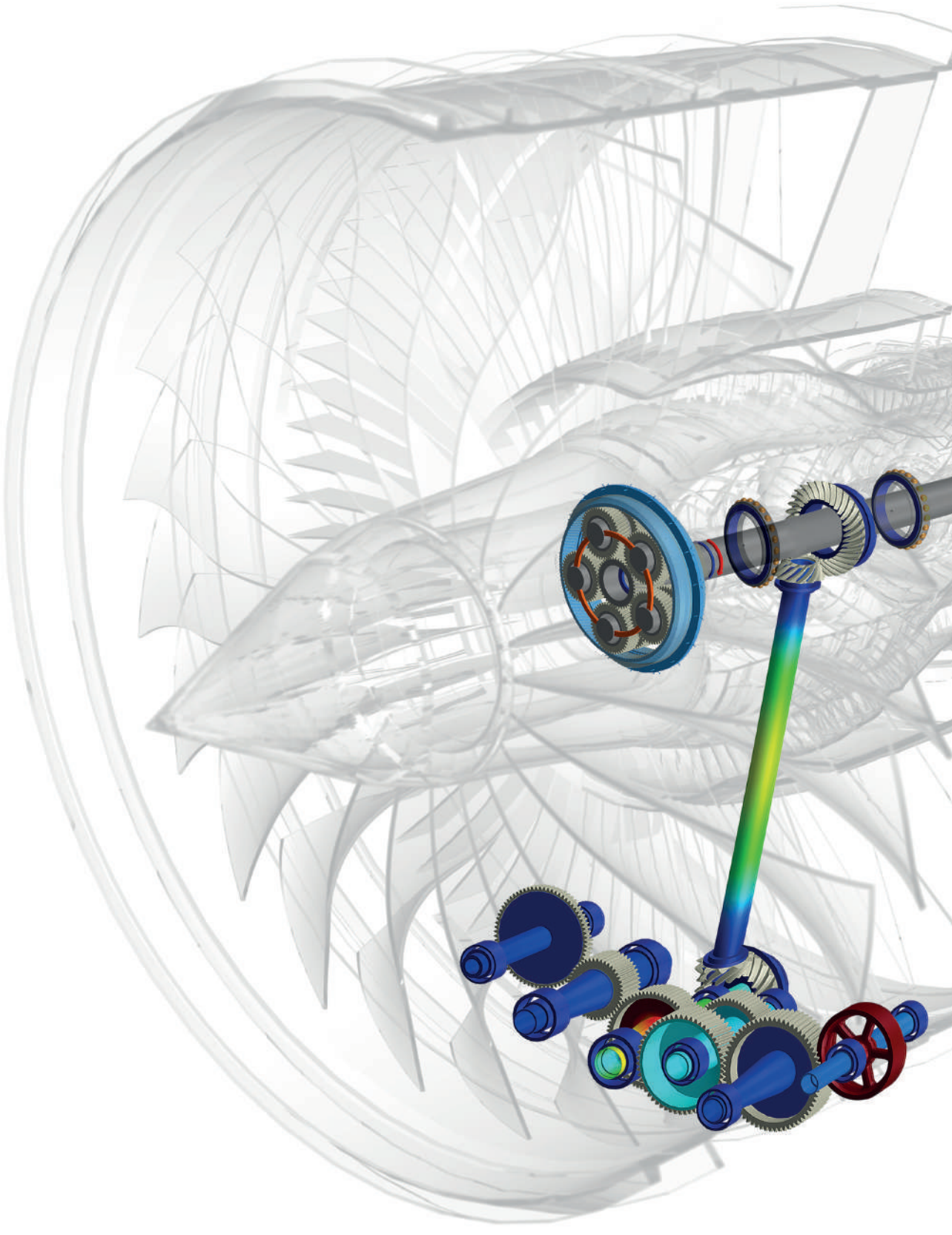
AIRWORTHINESS driven design

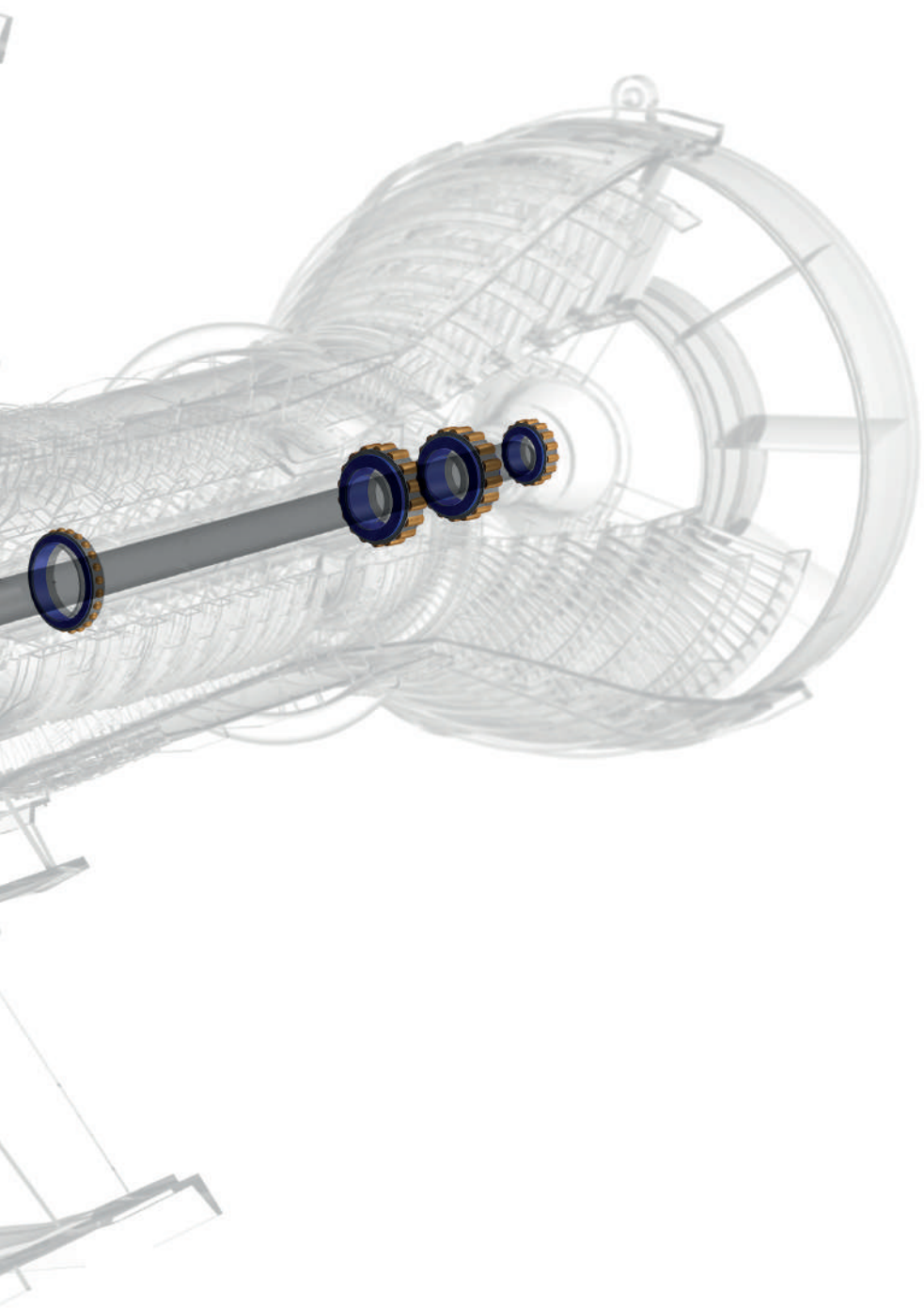
- Digital certification
- Aerospace physics
- Extended TBO
- Expedite development



Aero Engine Complete Drivetrain

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





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

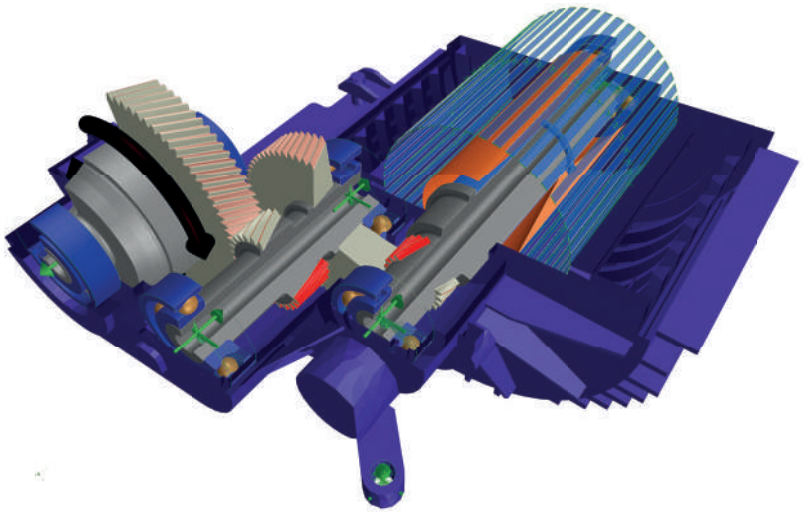
Geared Turbofan Development

The requirements on the aircraft industry to reduce pollution and fuel consumption are a significant challenge due to global environmental concerns and airline drivers to reduce energy costs. Transmission engineers continually need to develop innovative solutions to improve efficiency to meet these industry demands.

Romax's consultancy and expertise allows a large number of alternative concepts to be assessed quickly and accurately early in the design phase, to ensure optimal selection is made in terms of durability and efficiency.

One example is the development of new arrangements for geared turbofan or turboprop engines which introduce a transmission within the system. The gearbox is utilised to power the fan or propeller at controlled speeds. The turbine can then be optimised for size and speed, therefore increasing the propulsive efficiency of the low pressure system. By development of such systems, significant reductions can be gained in fuel burn, engine noise, CO_2 and NO_x emissions.

Electrification and Hybrid Solutions



Electrification and hybrid technology for aerospace applications are evolving quickly, driven by the demand for increasing efficiency and reduction in CO_2 emission.

Romax's innovative methods of analysing mechanical power transmission systems have placed our technology at the forefront of electrification. Underpinned by years of R&D and our leading position in automotive, Romax's unique simulation capabilities accurately predict interactions between the gearbox and electrical machine, and allow analysis and optimisation for power density, durability, efficiency and dynamics.

Our electrification experts have unrivalled expertise in developing complete electro-mechanical drivelines, ensuring whole system integration is achieved right from the start. Our software is both developed and used by our in-house experts, allowing us to offer a uniquely strong combination of cutting-edge simulation technologies and proven consultancy expertise within the field of electric drivelines.

Innovative and Integrated System Design

Weight is an important consideration for any component within an aerospace application. Larger deflections from weight-reduced thinner-sectioned components can lead to misalignment of the gears and bearings, reducing life and increasing vibration. Understanding the influences of these deflections is an essential part of the design analysis.

We have used our experience and advanced simulation techniques to evaluate an accessory gearbox considering complex weight-reduced component shapes within the transmission design. We assessed deflections and mode shapes of these components under various static and dynamic load conditions, and then identified the influence of the deformations on the gear mesh misalignment and bearing rolling contact. In addition, this enabled further optimisation of the structural components as well as gear or bearing micro-geometry.

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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