

# Adrian Technologies GmbH

RomaxDESIGNER optimises client designs to deliver improved gearboxes and axles faster



**“RomaxDESIGNER means we can accurately model the function and behaviour of any kind of planetary gear set. Its simulations improve our understanding and show the potential for improvement of selected concepts or designs. Verification is fast.”**

**Prof. Dr.-Ing. Jörg Adrian,**  
General Manager, Adrian Technologies GmbH

Providing driveline technology and design services for gearbox and axles, from concept engineering to prototype build and testing, Adrian Technologies GmbH (ATech) serves market sectors including defence, off-highway, agriculture and mining.

Headquartered in Germany and with offices in Belgium, Korea and China, clients include DANA, MSPrecision, KIMM, Kessler & Co., Shinjeong, Liugong, Xiangong, Xugong, Claas, PIV/Brevini, Hyundai TnA. “We primarily develop components and assemblies for non-automotive markets – and have used Romax software from day one, since 2000,” says Dr-Ing. Franz-Werner Adrian, company founder and president. “My previous employer used Romax, I was aware of the benefits, so we adopted RomaxDESIGNER as our key calculation and simulation solution. We now use the software in all phases of design and development.”

“Initially, we used RomaxDESIGNER as a straightforward calculation tool,” says Prof. Dr.-Ing. Jörg Adrian, general manager. “Over time, it’s increasingly become our optimisation solution, notably in microtopology, and has

## Client

Consulting, design and engineering services for Europe and Asia AWD (all-wheel drive) and MPV (multi-purpose vehicle) clients in defence, agriculture, off-highway, and mining.

## Challenge

To optimise design and development for diverse requirements/applications; make more informed decisions earlier in the process.

## Solution

RomaxDESIGNER software: whole-system simulation and modelling to support gearbox and driveline optimisation.

## Benefits

Investigating multiple concepts and designs to focus on the most effective; whole-system modelling to easily implement other components in the drivetrain; significant time savings.

greatly improved communications in terms of enabling us to discuss alternative design options in meetings and reports, and their impacts on system and component complexity, and, of course, the cost implications.”

## ‘Can you start tomorrow?’ - meeting client demands

Jörg Adrian continues, “We provide our clients with turnkey proof-of-concept projects, designing drivetrain components and controls, and with specialist technologies and knowledge to upgrade existing products for special applications.” With a project lasting 1-3 years on average, core ATech services include: concept studies, benchmarking and concept selection; layout, detailed drawing and supplier selection; and prototypes, testing and production release.

When they first get in touch, most of our non-Asia customers say something like, ‘we have a development project but can’t find an acceptable solution on the marketplace. Do you have any ideas?’ After discussing potential approaches, their next question is usually ‘can you make prototypes and, at the very least, perform functional tests on them?’ As a project progresses and the client likes our answers, the third question is ‘can you start tomorrow?’ We like that question best.” Adrian provides an example of how a client project might come about: “Distributor gearboxes in some all-wheel drive (AWD) and multi-purpose vehicles (MPVs) are often just adaptations needed to complete the drivetrain between shiftable transmission and axle. This can be because MPVs are normally produced in low quantities compared to other vehicles. Gearbox manufacturers can be extremely reluctant to make adaptations to current production transmission, with cost among the reasons.

## Optimising designs

“There are many all-wheel drivetrain concepts on the market,” Jörg Adrian continues. “The ‘best’ concept doesn’t exist yet, so our solutions are based on specific customer needs. RomaxDESIGNER enables us to properly model all concepts investigated; in a short time, frame it enables concept studies, parametric studies and improvements through advanced level analysis. Differentials can play an important role in drivetrain concepts, and make an essential contribution to driving stability, comfort and wear. RomaxDESIGNER means we can accurately model the function and behaviour of any kind of planetary gear set. Its simulations improve our understanding and show the potential for improvement of selected concepts or designs. Verification is fast.”

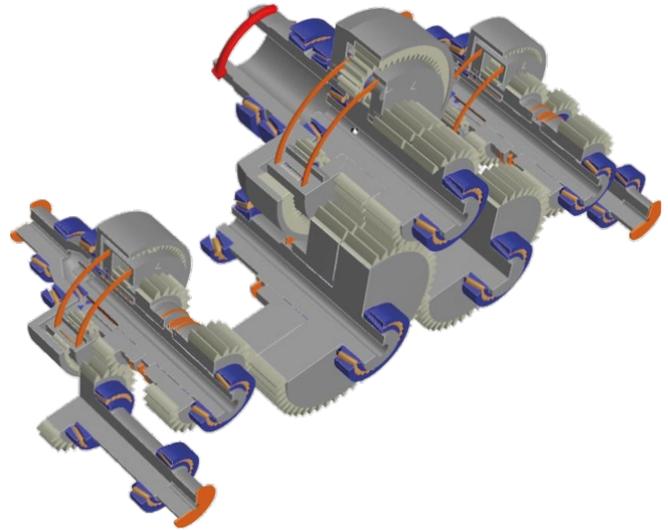
Franz-Werner Adrian adds, “I define Right First Time as a vision, a target to aim for. Of course, you want to reduce the number of iterations in a development project with the subsequent administration, new parts, new testing, and so on. Each iteration means more time and costs. Even if development projects without changes in product specification during the development phases are rather exceptional, we need to strive for Right first Time in order to have time and cost under better control.”

## ‘When performance counts’

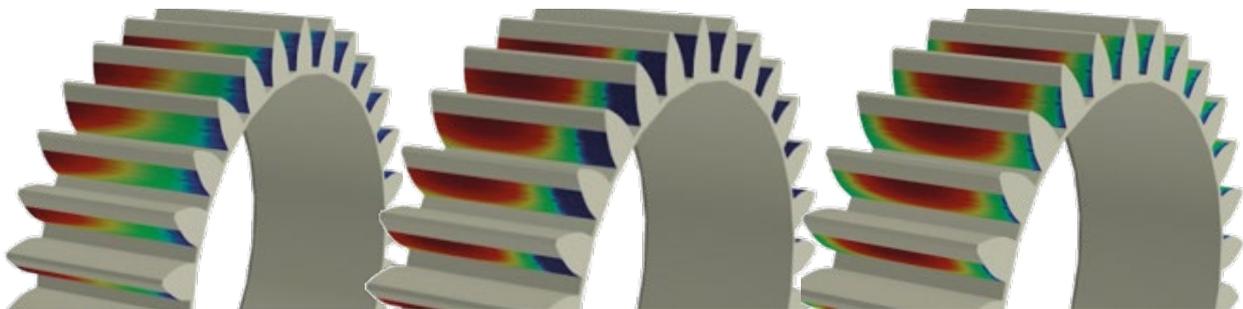
“Using Romax we can explore parameters and investigate different alternatives in the concept phase, and do so within very short time scales,” says Jörg Adrian. “One of the biggest time savings is in the simulation of measured/defined load cycles into the one used during testing. As well as modelling different concepts we want to investigate the impacts of different loads on reliability and lifespan. A key advantage of RomaxDESIGNER is we can easily implement other drivetrain components to simulate the complete system - even if we have no responsibility over those components, we can still observe the potential impacts. Our future plans definitely include continuing to work with Romax software - to deliver value to our clients, and to maintain our high standards of consultancy.”

## Summary of benefits

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- Rapidly assess concept designs and reduce design iterations
- Instil confidence in simulation with more accurate modelling and analysis
- Understand component interactions with a whole-system perspective
- Produce a higher quality end solution for customers, through intelligent design optimisation
- Save time and cost



All-wheel drive concept for a multi-purpose vehicle, modelled in RomaxDESIGNER



Gear contact pattern improvement (left to right) after microtopology modifications in RomaxDESIGNER



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*Since the time of writing this case study, the Romax product offering has evolved. The features and benefits described here most clearly map onto our new product Romax Enduro.*



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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