



MODELLING AND SIMULATION

LCM is a pioneer in modelling and simulating mechanical, electrical and coupled systems. We utilise modern software tools to both develop and improve our customers' products. On that basis, we simulate highly complex machines ourselves – ensuring reliable and economical optimisation.

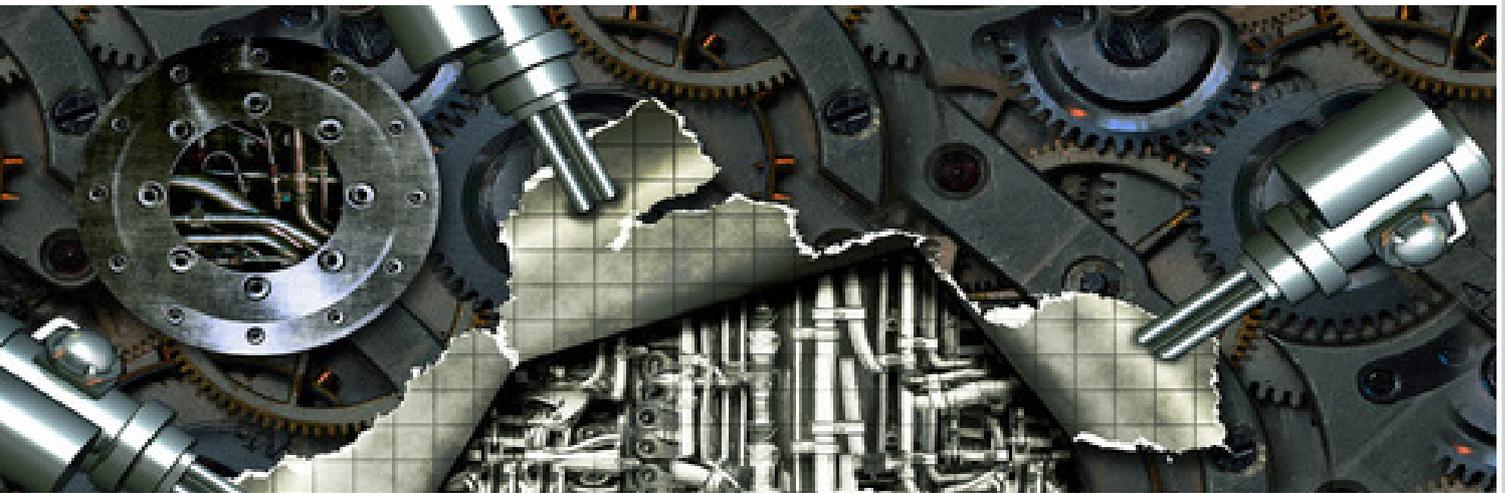
YOUR BENEFITS:

LCM is your experienced partner for a wide range of tasks in modelling and simulation – whether to electromagnetically simulate motors, develop a material model for a transformer core or optimise emission patterns of antennas. We support you in minimising the chance of breakdown, improving energy and resource usage, and increasing precision, speed and cycle time in systems and machines. Our profound understanding of machines and processes, as well as our use of the latest software, provide the basis to find a quick and reliable solution to your problem.

The HOTINT multibody simulation software developed by LCM allows all of the relevant influential factors to be mapped out in detail in the simulation model. With accurate simulation models, machine performance can be predicted in its working environment with a high degree of precision. The complexity of products is reflected in the large number of – sometimes unstable – parameters in the modelling, such as geometry, stiffness and damping. Fully automatic algorithms allow machines and processes to be optimised by making a suitable selection of parameters on the one hand, and unknown parameters based on measurement data from the real system to be identified on the other hand.

In the mechatronic design process, we rely on MagOpt for automated simulation, optimisation and evaluation – a tool that can integrate software packages from a variety of sectors. MagOpt is especially suitable for designing electrical and hydraulic motors and actuators, in addition to bearingless drive systems. Advanced algorithms ensure that all of the relevant parameters are coordinated perfectly.





OUR EXPERTISE INCLUDES:

- Profound understanding of machines and processes
- Comprehensive expertise of modelling and simulating complex mechatronic systems
- Automatic simulation, optimisation, evaluation and documentation
- Tailor-made software tools to integrate into development and production processes
- Use of commercial tools to simulate structural and fluid mechanics, electrodynamics and hydraulics

CURRENT REFERENCES:

Our knowledge and expertise in modelling and simulation can be demonstrated by the numerous projects that we have undertaken for customers in a wide variety of sectors. This is just a small selection of our references:

- From steelworks to press brakes: in simulation projects, we deal with metal forming processes in complex production procedures such as continuous casting, hot and cold rolling, stretch bending, folding and many more.
- A transformer core consists of thousands of sheets, which represents an insurmountable challenge for commercial simulation software. Developing an equivalent uniform material model allows the dynamic behaviour of large transformers to be simulated efficiently.
- Electrical drives must be able to cope with increasingly high demands in terms of energy efficiency. With our MagOpt simulation tool, we have optimised a wide range of motors and increased their efficiency whilst achieving a lower rate of material use. Many of these motors had already been serially produced for the automotive industry, industrial uses and medical technology.
- As components and circuits with the same or even higher performance undergo continual miniaturisation, the energy density also increases in these components. Thermal simulations of entire circuits in the design process help to detect hotspots early on and largely avoid them.
- Integrating antenna structures directly into components is becoming more and more commonplace, which is having a major influence on emission patterns. And this influence must be taken into account in the design and simulation. Commercial tools for 2D/3D field simulations are utilised, according to the degree of integration, to achieve an efficient antenna structure with maximal range and minimal energy use.
- The different of the components in modern machines requires the entire system to undergo an integrated analysis. With our HOTINT software, we simulate mechanical systems coupled with actuators, sensors and control systems to analyse magnetic bearing rotors, for instance.
- HOTINT's open interface enables it to be integrated into existing hardware and software environments. We seize this opportunity to simulate the interaction of flexible structures with gases and liquids.

