## Electric Motor Cooling with SIMERICS MP+

**SIMERICS MP+** CFD software can be used to perform thermal analyses of oil cooled electric motors with fast analysis times. Thermal effects can impact the design, spacing and size of these motors. The analysis requires a transient, three-dimensional CFD model comprehending all the important parts such as the windings, rotor and stator laminate, end rings etc. The multiphase Volume of Fluid (VOF) approach is used to model the convective cooling of the solid components by the oil flowing inside the rotor and the stator, while Conjugate Heat Transfer (CHT) is used to model heat conduction in the solid components. Excellent agreement with thermocouple measurements has been demonstrated.

The above type of analysis has acquired importance due to the rapid growth in the market share of electric vehicles.
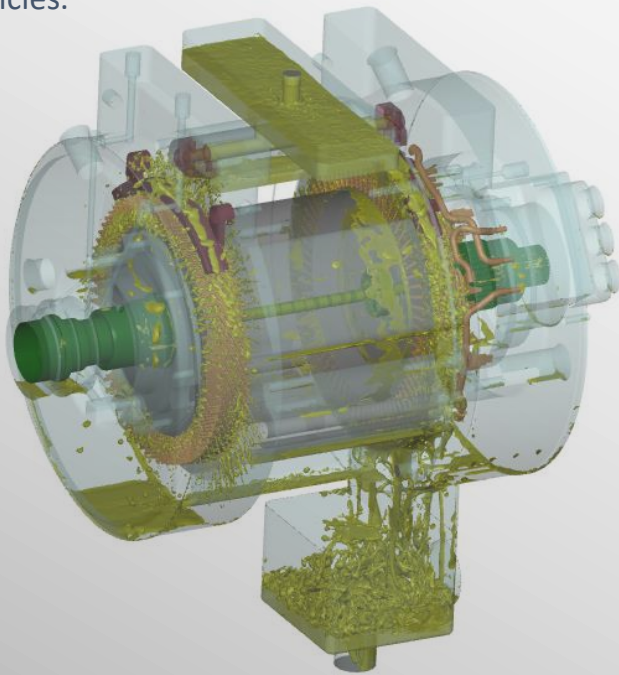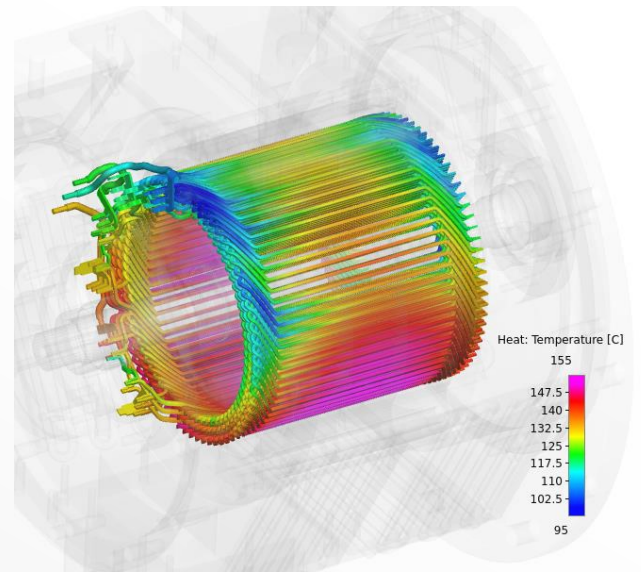
**SIMERICS MP+** is a CFD software environment that includes a robust distributed memory multi-node parallel solver, user friendly GUI based pre- and post-processors, semi-automated model set-up, automated meshing and an expression editor for user functions. The complete set of transient, three-dimensional transport equations are solved. A wide range of applications and physics can be simulated. The latter includes multi-phase flows, cavitation, fluid structure interaction, conjugate heat transfer, radiation heat transfer, design optimization and more.

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# SIMERICS MP+
## FLOW SIMULATION SOFTWARE

**ACCURATE**

**RELIABLE**

**FAST**
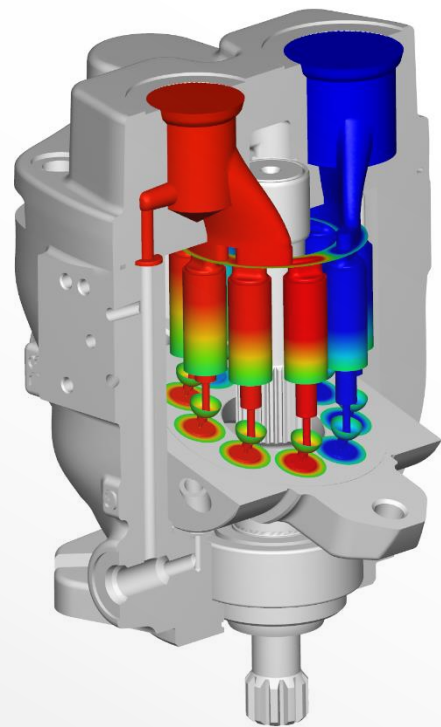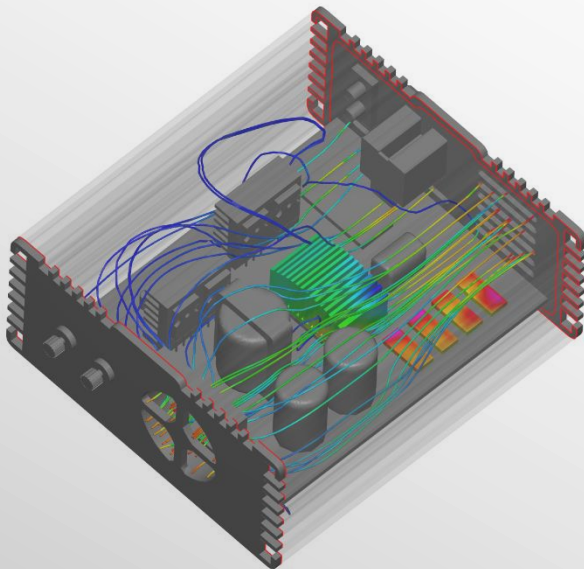
- **ACCURATE RESULTS**
- **RELIABLE SIMULATIONS**
- **FAST MODEL SETUP**

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