**Customer Highlight**

**DRIVING ELECTROMOBILITY WITH THE 3DEXPERIENCE PLATFORM**

Kreisel Electric, based in Austria, develops the world’s most advanced battery technology for electric vehicles and combines them with battery management systems, transmissions and electric motors to create complete electric vehicles—including the world’s first electrified Hummer H1.

The company was founded by three brothers whose passion for electric propulsion has given birth to high performing battery packs and energy storage systems for the road and home. Passion for electromobility technologies and fast cars were the driving forces behind Kreisel Electric’s project to electrically-power a 1971 EVEX Porsche 910, baptized the Kreisel EVEX 910e.

Replacing this classic model’s original combustion engine with its patented and award-winning long-range battery pack required careful planning, ingenious engineering and 3D technologies from Dassault Systèmes’ 3DEXPERIENCE platform.

“**We can integrate parameters like the heat transfer from the motor. We can set temperature limits. We can basically simulate everything.**”

—Helmut Kastler, Head of Mechanical and Electrical Engineering, Kreisel Electric

**ELECTRIC POWERTRAINS**

Kreisel Electric uses sophisticated modeling and simulation software to optimize a motor’s performance and balance all components of an electric powertrain, says Helmut Kastler, Kreisel Electric’s head of mechanical and electrical engineering.

One challenge is verifying that transmissions can keep pace with new, more powerful electric motors. In the early days of applying electric motors to transportation applications, a transmission had to handle 5,000 to 6,000 revolutions per minute (rpm); now, electric motors can generate 15,000 to 20,000 rpm. Electric sensors on the transmissions communicate information to the vehicle’s electronic control unit (ECU), which acts like a central nervous system, providing lubrication on demand to limit friction and heat.

“The software allows us to easily connect the characteristics of individual parts together and see the combined effect of the mechanical power, thermal power, electrical power, each to the other, so that we can create a whole system,” says Johannes Pumsleitner, a research engineer at Kreisel Electric. “We can start simulating systems by providing any parameter, and we can also simulate driving behavior.”

Noise management is another key issue. An electric motor can run almost silently. But the transmission, which has more mechanical components, generates noise if it is not properly synchronized with the motor. “We have to take care of the noise,” Kastler says. “You can simulate whatever you want, but you need to know which attribute has to be optimized.”

With 3DEXPERIENCE, Kreisel Electric engineers had a single source of trusted information that promoted real-time collaboration, state-of-the-art design and simulation applications to engineer, test and manufacture all required components and systems as well as planning tools to ensure the project stayed on budget and on schedule.

**CHALLENGE**

To transform the legendary 1971 EVEX Porsche 910 combustion-powered car into an electrified supercar, Kreisel Electric needed to design and build a battery pack, cooling system, gearbox and powertrain that would fit in the car’s available space. To achieve this, the company needed a solution that was robust yet flexible enough to enable the different disciplines involved to collaborate while keeping costs and schedules in check.

**SOLUTION**

Kreisel Electric relied on the 3DEXPERIENCE platform and its Electro-Mobility Accelerator’s integrated applications that cover the entire development lifecycle from requirements to digital concept, design, simulation, manufacturing as well as overall project management.

**BENEFITS**

Project stakeholders enjoyed real-time collaboration, centralized and secure access to geometric data, company know-how and project information thereby promoting creativity and innovation while reducing costs and overall development time. Digital crash simulations reduced physical prototyping costs and the integration between engineering and production enabled early manufacture of designed parts.

For More Information

[www.3ds.com/customer-stories/kreisel-electric](www.3ds.com/customer-stories/kreisel-electric)