



FAST DESIGN FOR ELECTROMOBILITY

C-TEC SCALES UP IN THE CLOUD WITH ALTAIR AND ORACLE CLOUD INFRASTRUCTURE

About the Customer

C-TEC, a young and innovative company based in Blaustein, Germany, specializes in the development and production of intelligent devices, machines, and systems. Special machines and solutions enable C-TEC's customers to optimize their production processes and to perfect, accelerate, and automate handling and throughput. C-TEC helps manufacturers improve their work processes and product quality — and C-TEC handles the entire range of functions, from engineering and production, to assembly and commissioning from a single source, ensuring that system functionality and reliability meet the company's objectives.



Having little to no experience with high-performance computing, it was very beneficial to have a solution that took care of our system and needs so we could focus on our expertise in engineering.

Miguel Salazar, simulation engineer, C-TEC



Their Challenge

The latest E.U. standards for passenger-vehicle fuel efficiency and emissions went into effect in 2017 with the Worldwide Harmonised Light Vehicle Test Procedure (WLTP). While automakers have embraced the new testing cycle, it demands more stringent compliance. C-TEC strove to **improve and optimize the aerodynamics** of box utility vehicles to meet WLTP standards while keeping most of the same components. This required **GPU-accelerated high-performance computing** (HPC). “The challenges we faced were a lack of experience in CFD simulations and no access to the hardware required to run expensive, compute-intensive multi-GPU workloads,” said C-TEC simulation engineer Miguel Salazar.

To comply with WLTP standards, C-TEC needed to optimize vehicle aerodynamics without changing too many components or incurring high costs.

Our Solution

C-TEC chose to work with Altair and Oracle on a solution — the turnkey Altair® Unlimited™ virtual appliance on Oracle Cloud Infrastructure (OCI). The fully managed Altair cloud appliance on OCI's superior bare-metal infrastructure removes the need for complex HPC management and enables flexibility, easy scaling, and top performance. It delivers unlimited use of a wide range of Altair solver software, plus HPC resource management tools and a user-friendly web portal. With Altair Unlimited, the C-TEC team **avoided the high cost of on-premises HPC architecture**. Altair's history in CAE and engineering simulation means our enterprise computing specialists know what companies like C-TEC need and can build a highly curated software as a service (SaaS) solution that's **easy to use and ready right out of the box**. With the Altair Unlimited virtual appliance on OCI, C-TEC ran Altair® ultraFluidX® on NVIDIA A100 Tensor Core GPUs to create a new design that reduced aerodynamic drag while retaining functional properties like a lightweight construction and high payload capacity.

Results

Stringent regulations and rising fuel prices are increasing the demand for aerodynamically optimized vehicles — which is an especially important feature in electric vehicles. “In our application, we **achieved up to 42% drag reduction** compared to a standard box-body workload,” said Salazar. “For driving out of town or on the motorway, test drive **fuel savings are around 27%**,” he said, and the improvements also increased vehicle range. By computing in the cloud, C-TEC avoided the high cost of an on-premises computing cluster. They avoided capex costs and the solution enabled them to pass along usage costs as an operating expense for the project. It also allowed the company to explore a new field and ultimately add it to their own permanent portfolio. Salazar added, “I'm pleased to say we saw significant **cost savings of around 49%**.”