

Leak Detection for Electric Vehicle Battery Production

Long-standing customer relationships and extensive expertise

Electric vehicles are a decisive factor in reducing CO₂ emissions in road traffic. They store the energy required for propulsion in batteries and an electric motor converts it into motion. In contrast to combustion engines, no fossil fuels are required. If the batteries are charged with electricity from renewable energy sources, they even have a completely CO₂-free energy balance. Today, lithium-ion batteries are used almost exclusively as accumulators. Vacuum technology is indispensable for their production.



Tracer gas leak detection ensures quality

The proper functioning, quality and safety of lithium-ion batteries, which are used as accumulators in electric vehicles, depends on their integrity and impermeability to external influences such as moisture ingress. For this reason, leak detection systems are used in battery production to check the batteries. Pfeiffer Vacuum supplies the necessary vacuum solutions from a single source.

One of the world's leading battery manufacturers for the automotive industry is currently using test gas leak detection systems from Zeltwanger Leaktesting & Automation GmbH, which are equipped with complete solutions from Pfeiffer Vacuum. The systems must meet stringent requirements. The decisive factors here are achieving the required cycle time and high reproducibility of the battery cell test.



Enabled by Pfeiffer Vacuum technology, even the smallest leaks can be quantified and localized with the help of Zeltwanger's testing systems. This makes it possible to quickly eliminate leaks in a downstream production step. Changes to geometries and improvements to production methods and processes can be initiated based on the results obtained. This leads to quality improvements, increases the yield and reduces manufacturing and testing costs.

Together with Zeltwanger, Pfeiffer Vacuum's team of experts designed the appropriate solutions – tailored to the end customer's requirements.

Pfeiffer Vacuum is characterized by its know-how and expertise in leak testing and vacuum technology, combined with a broad product portfolio that offers the entire product range from a single source. Helium leak detectors from the ASI 35 series as well as valves, vacuum gauges, DuoLine, Hena and Pascal backing pumps and other components are used in the test system.



Figure 1: Products from Pfeiffer Vacuum

“Since our entry into leak testing with helium a few years ago, we have acquired extensive expertise through intensive development work and close cooperation with leading suppliers of key components - including Pfeiffer Vacuum. In addition to innovative ideas and skillful implementation, this is one of the main reasons for our leading position today. The transfer of knowledge and the support of the Pfeiffer Vacuum application team helped us with the preparatory work for important orders and enabled us to experience a helpful learning curve,” explains Markus Mattauch, the responsible project manager at Zeltwanger.



In the years leading up to project realization, the collaboration between Pfeiffer Vacuum and Zeltwanger was intensified. Zeltwanger had the opportunity to familiarize itself with the functionality of the technology in earlier projects. The concept for the vacuum components was developed in close cooperation with a view to performance, footprint and energy efficiency. The decisive factors were the short-term availability of the products and the well-known quality of Pfeiffer Vacuum.

Markus Mattauch adds: “When a customer from the automotive industry enquired about the supply of test gas leak detection systems, Pfeiffer Vacuum was our first choice: Here, we can not only rely on impeccable quality and the immense know-how of the experts. The team also kept to our very tight schedule and provided us with excellent support.”



Figure 2: Patrick Lange (Key Account Manager Pfeiffer Vacuum, right) and Jonas Klös (Market Manager Pfeiffer Vacuum, left) together with the project manager on the customer side, Markus Mattauch, (center) in front of a battery leak detection system

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optimal vacuum solution?**
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