It's all in the vacuum

Jonas Dobner, Application and Project manager at Pfeiffer Vacuum dropped in on PES Solar. Needless to say, we were very interested to hear about their latest vacuum technology and solutions. These are already making an impact in the renewable energies segment and used in leak detection and various types of lithium batteries in the company has a long history in our business and is ready for the challenges ahead.

Jonas Dobner

PES: Welcome back to PES Solar/PV, it's great to talk with you. Would you like to begin by giving us a brief overview of Pfeiffer Vacuum?

Jonas Dobner: Pfeiffer Vacuum develops, produces and distributes components and solutions for vacuum generation, measurement, analysis and leak detection. The company is a global player and has 3,200 employees worldwide. Pfeiffer Vacuum offers reliable vacuum and leak detection solutions, for battery production in the Li-ion battery market.

PES: We know that climate change and environmental awareness mean a higher demand for renewable energy solutions, using improved technologies in the field of energy storage. As these all depend on vacuum technology, could you explain what this is in general and specifically in regards to lithium-ion batteries?

JD: The application of vacuum is indispensable in the production of Li-ion batteries. Vacuum is required for mixing the so-called slurry, which is applied to the battery cell electrodes. The coil drying and electrolyte filling also takes place under vacuum.

Furthermore, leak detection is an essential step in quality control to protect battery components, cooling systems, battery modules and battery packs from moisture ingress. In addition, the generation or escape of hazardous substances is avoided.

PES: We know that Li-ion batteries are being used in more and more applications. Are all these batteries produced in the same way?

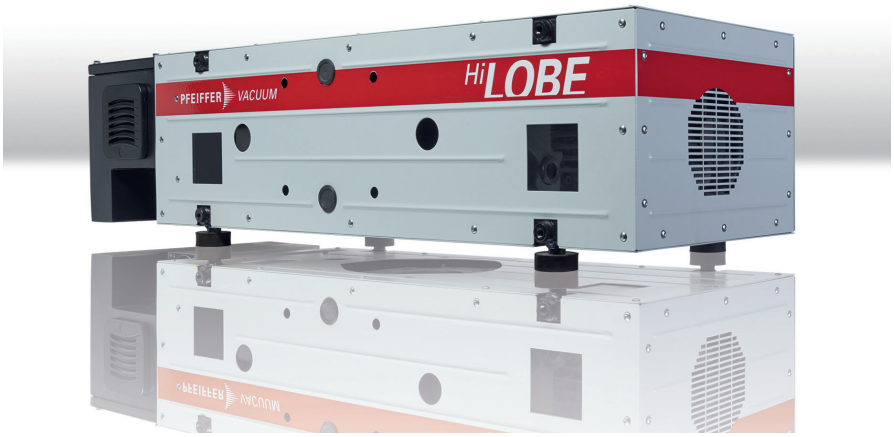
JD: No, the production steps vary slightly for the different cell types. There are three common types of battery cells:

The pouch cell which is also called coffee bag because of its appearance, the prismatic cell, where the cell is integrated into a stable rectangular housing and the cylindrical cell which we all know from the supermarket. This applies for consumer type cylindrical cells and their larger counterparts for e-mobility or grid-connected applications.

PES: Although there are numerous types of Li-ion batteries, would it be fair to say that several of the production steps for the batteries require vacuum technology?

JD: Absolutely! As long as we are talking about Li-ion batteries, with liquid electrolyte there are no differences in vacuum applications. With the development of solid-state batteries, which have a solid electrolyte, the whole thing will look a bit different and other vacuum processes will become relevant.

PES: We have heard about your leak testers and we would like to know more, is there a one fit for all users or does it depend on the area the client is working in?



‘As the market becomes more dynamic, an agile and innovative product development process is essential to optimally serve the needs of the customers.’

JD: This really depends on the application. Battery components like the cell cover clearly are the domain of tracer gas leak detectors, with their low detection limit. Other applications like cooling circuits are optimum for our high precision Micro-Flow leak detection technology, which uses air as a tracer gas.

Some applications are even covered by both detector technology types. This applies for example to testing battery packs. Parameters like PASS/FAIL criterion, localizing or integral test, and last but not least, costs lead all too soon either to leak testing with a specific tracer gas, or use of air-based test methods.

We are proud of our strong application support, which assists our customers in selecting the right test criteria and methods.

PES: Please could you also tell us about your vacuum pumps, why are they important to the process?

JD: In general, the pumps generate the vacuum which is needed for the different production processes. The pumps have to have a high resistance to poisonous and toxic fumes in drying, filling and formation processes. Pfeiffer Vacuum pumps generally are known to be robust and efficient to ensure sustainable production of Li-ion batteries.

PES: In an industry where things change so rapidly, how important is R&D to you?

JD: As the market becomes more dynamic, an agile and innovative product development process is essential to optimally serve the needs of the customers. Pfeiffer Vacuum also collaborates with relevant industrial partners in the development of pumps and leak detectors.

PES: Currently are there any new products in the pipeline?

JD: In March we introduced a completely new developed series of scroll pumps called HiScroll to our product portfolio, which guarantees short cycle times and increased energy efficiency.

Regarding the production of Li-ion batteries, it is especially used for electrolyte filling processes. With our Roots pump HiLobe we offer a pump for low and medium vacuum applications, at lower operating costs and short pump-down times.

Earlier this year we also introduced our new Helium and Hydrogen sniffer leak detector, ASM 306 S, for faster cycle times especially in battery pack testing.

Additionally, we can provide analytical tools in the area of mass spectroscopy, such as the OmniStar GSD for the detection of electrolytes.

PES: Why should a prospective client choose your products, what makes them stand out from the competition?

JD: In its 130-year-old history, Pfeiffer Vacuum has distinguished itself first and foremost in collaborating, with customers to develop customized solutions. In the field of leak detection, Pfeiffer Vacuum is the only company that offers leading air leak testing solutions, as well as better tracer gas leak detection technologies. Pfeiffer Vacuum also can provide pumping solutions, with outstanding performances for short cycle times and efficiency.

PES: We know Pfeiffer Vacuum is a global player, are there any markets that you would like to break into, geographically speaking?

JD: We can proudly say that we have massively expanded our existing facilities in Wuxi, China, with a new production plant. In the Li-ion battery market especially, it is necessary to be present in Asia. Most of the major battery producers are based there.

But also, in Europe, where new battery manufacturing plants are planned, we are prepared to fulfill the local needs and can offer strong global sales and service network.

PES: What are your predictions for the solar industry in the coming year and Pfeiffer Vacuum in particular?

JD: Pfeiffer Vacuum has been able to participate in the growth of the solar industries over the past few years. We see a significant investment cycle starting from 2021. In the meantime, in the solar business are researching new technologies to optimize their production lines and to increase the efficiency of the solar cells. The demand for renewable energies will push the solar industry enormously in the long term.

www.pfeiffer-vacuum.com

Pfeiffer Vacuum

Founded in 1890

Workforce: approx. 3,200

Sales and service companies: more than 20 worldwide

Manufacturing sites worldwide: 10

Pfeiffer Vacuum is one of the world’s leading providers of vacuum solutions.

In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems.

Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products that are used in the analytics, industry, research & development, coating and semiconductor markets.