

Battery production powers up

Uni Münster, Germany





The University of Münster, Germany MEET battery competence center employs an international team of over 150 scientists. MEET brings together basic scientific research and industrial applications in one location. The team works on innovative electrochemical energy storage devices with enhanced performance, longer lifetime and much higher energy, while still providing maximum safety.

Prof. Martin Winter and Dr. Gerhard Hörpel are in charge of building up the center that focuses on:

- new electrode materials with higher capacity
- new electrolyte materials
- new productions processes

The research center has been built up with more than 30 external industrial partners, representing the entire value chain from raw materials suppliers to end users.

The MEET Arcades are the home of the star of the 1,000 m² research center: the battery laboratory, which includes the following modules:

- active materials synthesis
- electrode and cell production
- cell testing, safety and electrical measurement technology

Case study

Lithium battery research and production.

Advantages:

- Stable and exact low dew point conditions in dry room
- Constant conditions all year round
- Turn-key delivery of complete dry room
- Only one supplier – saves time
- Energy-efficient design



Technical Manager Mr. Uwe Hoolt operating the MDU system.

Research of great importance

The center is expected to become one of Europe's top research institutes for electrochemical energy storage devices.

Lithium-based batteries have a special potential because they are flexible and variable when used for energy storage. Today they are already the dominant energy storage system for small mobile devices and their superior energy and power density show great potential for use in large systems like cars.

Up until now lithium-ion battery performance has not been sufficient for use in large systems. The focus at MEET is the development and characterization of materials for lithium batteries as well as new production processes for lithium-ion batteries with better performance, improved safety and lifetime.

Extreme production climate demands

Industrial Lithium battery manufacturing takes place in settings of all sizes, from small laboratory environments to full mass production dry rooms.

These high energy batteries must be produced in less than 1% humidity environments because lithium reacts with water vapor to form lithium hydroxide, hydrogen and heat. Exposure to moisture levels greater than 1% results in poorer battery quality, performance and shelf life.

The University already knew of Munters when the MEET center was established, since one of our high efficiency desiccant air treatment systems had been in use for some time in a smaller battery research dry room, supplying dry air at very low dewpoint.



Turn-key supply shortened installation time

Munters was the only supplier of air treatment systems that was able to supply a turn-key project. As a result, Munters was appointed supplier and delivered a 30,000 m³/h MDU system for installation in the new MEET research center 100 m²/315m³ dry room.

By using Munters as its only supplier of all dry room components, MEET was able to finish the new facility very quickly, which was a very important parameter.

By just using Munters as its supplier, MEET saved a lot of coordinating and planning time. Munters handled all details such as cabling, lighting, floor, windows, ducts, etc., and completed the total installation exactly on time.

The MEET battery center is the only University in Europe that has such high quality and large dry room facilities, and expects to attract both Ph.D students, scientists and teachers from all over the world.



Munters low dew point expertise

This Munters MDU system is specially designed to control moisture levels at -43°C dewpoint with 12 persons working in the room. The MDU system supplies an air flow of $30,000\text{ m}^3/\text{h}$, creating an air-exchange rate at 95 1/h. (Exhaust air $1,200\text{ m}^3/\text{h}$).

The supply air is distributed into the dry room via a ceiling of perforated sheets to achieve laminar flow conditions. The return air intakes are integrated in the wall panels a half meter above the floor.

The desiccant wheel is individually designed with a unique low dew point purge sector for heat recovery and a special cooling sector that ensures efficient dehumidification performance with very low energy consumption.

This closed loop reduces the moisture load as no outside air is required for cooling down the rotor material. Energy consumption is considerably reduced and rotor and sealings lifetime are prolonged.

A special team at Munters are designing low dew point solutions for lithium battery manufacturers, providing individual solutions for the demanding processes.

Thanks to many years of experience and the continuous development of rotor materials, purge sectors and energy efficient components, Munters is able to supply systems meeting the greatest demands from battery manufacturers all over the world.

Would you like to find out if Munters has a solution for your company too? If so, please visit our website, www.munters.com

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