Press release

Hardheim, November 04, 2021

EIRICH to present trailblazing process technology for lithium-ion batteries at the Battery Show Europe 2021

Excellent slurries and continuous coater supply

Flexible, efficient and sustainable, EIRICH MixSolvers® offer an effective solution in electrode mix processing for laboratories and gigafactories alike. Downstream, the ContiFeeder® process ensures continuous coater supply. EIRICH will showcase its future-shaping solutions for lithium-ion batteries at the Battery Show Europe 2021 in hall 8, stand 126.

Processing electrode mixes for lithium-ion batteries is one of the most complex elements in mixing technology. At present, this process of coating the electrodes usually involves slurries. The quality of the mix when preparing these slurries directly influences their processability and affects cell performance.

The MixSolver® – the perfect solution for labs and gigafactories alike

EIRICH's MixSolver® is an intensive mixer that is specially optimized for this purpose. It is available in several sizes for various applications, from laboratory systems with throughputs of just a few hundred milliliters per hour all the way to 1,000 l/h per mixer. Unlike conventional mixing systems like planetary mixers, the MixSolver® features a rotating mixing pan with an eccentrically arranged mixing tool. The tool's geometry and speed are adjusted precisely to the processing application. "The MixSolver® gives us excellent control of the shear forces we apply in the various preparation stages. We therefore have an excellent range of options for influencing the properties of the slurries, while our customers benefit from higher solids content and greater battery performance," explains Dr. Stefan Gerl, Head of Process Engineering at EIRICH. The system also makes it possible to maintain identical slurry quality, even with increased output, as the only changes are either increased fill level or reduced idle times. This simplifies scale-up and massively increases flexibility.

The quick, energy-efficient way to perfect slurries

The MixSolver® enables a process that creates a perfectly dispersed electrode slurry in 15-20 minutes. The first step involves intensively mixing all the dry components (active materials, conductive carbon black, binding agents and additives). After adding a sufficient portion of the solvent, the mixture is processed to create a plastic mass. This has a major influence on the final slurry quality. The plastic body is then thinned to the required viscosity. Dr. Gerl is convinced: "With energy consumption of around 16 Wh per liter on production machines and incredibly high solids contents, we achieve excellent performance when producing electrode slurries compared to other processes." A special measurement procedure conducted during or after the mixing process allows for inline viscosity measurement for quality assurance purposes. This ensures

that only slurries falling within the customer's specified tolerances are taken from the mixer. The mixer is equipped with EvacMix® technology for directly degasified slurries. The rotating mixing pan is surrounded by a tight-fitting pressurized container that degasifies the electrode mix alongside the mixing process. EIRICH also offers the MixSolver® with a double jacket for a temperature-controlled process, as well as with explosion protection.

The EIRICH ContiFeeder® – perfect for just-in-time coater supply

The ContiFeeder® process is EIRICH's response to the need for a high-performance system directly connected to the coater. As with processing in the extruder, the electrode mix is emptied in a slurry tank attached to the mixer after the mixing procedure. This enables additional degasification, temperature control and quality assurance though inline sensors or samples. If this more intensive quality control detects that a batch is defective, it can be easily ejected without negatively affecting the slurry stored in the buffer tanks. These tanks are used as intermediate storage on high-output systems. The last of these provides the coater with a continuous supply of slurry. Users therefore have a better range of options when it comes to batch process quality control, while also enjoying the benefits of continuous coater supply. "We are responding to increased inline process control and IoT with our QualiMaster® LiB system for quality assurance and process optimization," explains Gerl. This is based on the QualiMaster® quality system for molding materials in casting, which has proven itself around the world for decades. "It constantly measures and records several hundred values, before providing them to manufacturing execution systems."

Dry-processed electrodes spreading fast

LiB technology will continue to develop in the coming years. By delivering high flexibility in terms of raw materials and processing methods, EIRICH process technology lets users adjust quickly and smoothly to all raw materials, recipes and processing methods in battery production. Dr. Stefan Gerl believes that the next few years will see an increased trend towards dry-processed electrodes: "That is not a problem for us. The operating principle of the EIRICH intensive mixer is perfectly suited to processing structured electrode dry mixes. All we have to do is adjust the operating method and a few parameters compared to electrode slurries," he explains. This means that EIRICH customers no longer have to replace the mixer as and when processes or recipes change in future.

EIRICH will present its pioneering process technology at the Battery Show Europe, to be held from November 30 to December 2 2021 at the Messe Stuttgart, in hall 8 at stand 126. The following landing page provides an insight into the advantages that EIRICH solutions offer in electrode mix processing:
https://www.https://www.eirich.com/en/industries/li-ion/

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Images:

Unlike conventional mixing systems like planetary mixers, the MixSolver® features a rotating mixing pan with an eccentrically arranged mixing tool. This creates perfectly dispersed slurries in 15-20 minutes, with low energy consumption.

The MixSolver®, shown here with the eccentrically arranged mixing tool, is optionally available with EvacMix® for directly degasified slurries, a double jacket for a temperature-controlled process, and explosion protection.

Downstream from electrode slurry processing in the MixSolver®, EIRICH's ContiFeeder® process ensures a continuous feed of high-quality electrode mix.

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EIRICH mixing systems reliably ensure excellent wet and dry dispersion. This helps quickly achieve an optimum carbon network structure. These perfect electrode mixes lead to especially high battery capacities.

EIRICH intensive mixers are also suitable for preparing active materials and processing structured electrode dry mixes.

All Photos: EIRICH

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About EIRICH:

The EIRICH Group, with Maschinenfabrik Gustav Eirich as its strategic center in Hardheim, Germany, is a supplier of machines, plants and services for mixing technology, granulating/pelletizing, drying and fine grinding. Its core competences are processes for the preparation of bulk materials, slurries and sludges. These processes are mainly used in areas like ceramics and refractory materials, casting, construction materials, battery masses, fertilizers, ore processing, precast concrete and pavers, as well as recycling of steel dusts and sludges. Through close cooperation between its own technology centers around the world, as well as with research and teaching institutions, the "hidden champion" provides solutions for innovative and economic products and processes. The family-run company was founded in 1863 and now has twelve sites across five continents.

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