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## ARKEMA PRESENTS SPECIALTY MATERIALS ENHANCING BATTERY EFFICIENCY, SUSTAINABILITY AND RELIABILITY

**At The Battery Show Europe 2023 - Stuttgart, Germany, May 23-25, Booth J35 - Hall 10, Arkema is releasing a full range of specialty materials and more sustainable solutions for use both inside and outside of electric vehicle (EV) and energy storage system (ESS) batteries**

*“Arkema has a long history of innovation in the battery industry through its KYNAR® PVDF electrode binders and separator coatings. We are leveraging that knowledge, the Group’s extensive network of partner customers globally and unique synergies across its high-performance polymers, adhesive and coating solutions segments to invest heavily in the future of that market,”* Anthony Bonnet, Global Energy Scientific Director said.

Here are a few of the innovations Arkema will be showcasing at The Battery Show this year:

### MORE SUSTAINABLE PERFORMANCE INSIDE THE CELL

Arkema's flagship Kynar® PVDF will be showcased as high-performance material with a proven legacy for battery cell manufacturing. Kynar® PVDF is an efficient solution as an electrode binder and edge coating allowing an outstanding performance throughout the cells' service life. PVDF is a material of choice as a binder and adhesive layer for battery cell separator coatings.

### ULTRA-HIGH PURITY FORANEXT® LITHIUM SALTS

- Arkema will present its **Foranext® LiFSI lithium salt**, well-known for its best-in-class conductivity. The ultra-high purity and stability of Foranext® LiFSI helps tremendously with the capacity retention of the battery cell – adding high concentrations of LiFSI in the electrolyte will improve the lifetime of batteries. Also, Foranext® LiFSI stability in water is compatible with hydrometallurgy recycling processes. LiFSI is stable in water, enhancing safety (no additional HF generation) but also gives LiFSI a great recovery potential.

### NEW INCELLION™ WATERBORNE ACRYLIC SOLUTIONS

- Arkema recently introduced new acrylic-based solutions targeting higher cell performance with faster charging, longer life-cycle durability, and **increased energy density while ensuring world class safety and environmental compliance**. See the announcement [here](#) to learn more.

### INNOVATION OUTSIDE THE CELL

#### SOLUTIONS FOR THERMAL MANAGEMENT

- **Bostik, Arkema's specialty adhesives business**, introduces thermal conductive adhesives (TCA) for bonding battery cells and managing heat in Cell-to-Pack designs. **The XPU TCA 202** is a two-component, polyurethane-based adhesive specifically designed for heat dissipation in battery pack assemblies. It perfectly tackles the challenge to balance thermal conductivity with high mechanical strength while maintaining good levels of flexibility thanks to high elongation. **Its low-monomer content allows to meet most stringent regulations and enables easy product handling without specific training**. At a practical level it is also fast and

easy to process through automatic mixing, dosing and dispensing equipment. It adheres well to most substrates without using a primer, and cures at room temperature.

The launch follows the recent announcement - on May 17<sup>th</sup> - of the planned acquisition of Polytec PT by Arkema.

- **100% Bio-based Oleris® material for dielectric fluids** for direct fluid immersion cooling systems is derived from renewable castor oil, enhances dielectric fluids in battery direct liquid immersion cooling systems. The 100% bio-based n-heptanoic acid and carbon-neutral C7 fatty acid enables the synthesis of high-performance polyol esters, resulting in dielectric fluids with low viscosity, lower pour point, excellent oxidation stability, and biodegradability. This technology marks a major step forward in the development of more sustainable solutions for battery **thermal management**.

## SOLUTIONS FOR LOWER ENERGY INTENSIVE DIELECTRIC INSULATION

- With the emergence of electric mobility, new solutions that allow decarbonization are emerging. **New solvent-free UV technology enables low energy consumption**, instant drying and ease of application, which are key factors for efficiency and mass production of dielectric coatings for battery cells. The high performance **Sartomer® UV curable specialties are enabling this transition**, providing excellent dielectric properties, adhesion and flexibility.

By leveraging Group synergies with Bostik adhesive solutions and expertise, Arkema is identifying opportunity to develop solutions with unrivaled adhesion properties between the coated battery cells.

## LOWER CARBON FOOTPRINT RILSAN® POLYAMIDE 11 FOR EV BUSBARS

- **100% Bio-based Rilsan® Polyamide 11**, derived from renewable castor plants, for EV battery busbars, offers superior abrasion, thermal, and chemical resistance. Demonstrating its commitment to sustainability, Arkema has partnered with ENGIE to supply 300 GWh/year of renewable biomethane, further reducing the carbon footprint of Rilsan® Polyamide 11.

## INNOVATION FOR MORE CIRCULAR “END OF LIFE”

- **Arkema is collaborating with the Rhinoceros Project**, a consortium dedicated to advancing sustainable reuse and recycling in lithium-ion batteries across the European Union. Hosting a recent meeting, the members focused on cost-effective and sustainable technologies for battery materials recycling and reuse. Recovering and recycling KYNAR® PVDF, widely used as a battery cell electrode binder, was a key area of discussion. Learn more about the project [here](#)

Arkema is investing in one of the most complete product portfolios in the battery industry, including more sustainable solutions for cell assembly, pack assembly, thermal management, management systems and fire protection.

To learn more about battery solutions from Arkema, click [here](#) and visit booth # Booth J35 - Hall 10 at The Battery Show in Stuttgart.

Building on its unique set of expertise in materials science, Arkema offers a portfolio of first-class technologies to address ever-growing demand for new and sustainable materials. With the ambition to become in 2024 a pure player in Specialty Materials, the Group is structured into 3 complementary, resilient and highly innovative segments dedicated to Specialty Materials - Adhesive Solutions, Advanced Materials, and Coating Solutions - accounting for some 91% of Group sales in 2022, and a well-positioned and competitive Intermediates segment. Arkema offers cutting-edge technological solutions to meet the challenges of, among other things, new energies, access to water, recycling, urbanization and mobility, and fosters a permanent dialogue with all its stakeholders. The Group reported sales of around € 11.5 billion in 2022, and operates in some 55 countries with 21,100 employees worldwide.

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