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## PRESS RELEASE

# Arkema and Morrow enter a non-exclusive partnership to develop high-voltage solutions for batteries

**Arkema and Morrow have signed a Memorandum of Understanding for the development, screening, and testing of novel electrolyte formulations for the next generation of high-voltage batteries. Based on Arkema's proprietary ultra-pure lithium electrolyte salts and Morrow's large format batteries based on the cobalt-free high-voltage spinel (LNMO), this partnership will accelerate the development of new generations of batteries.**

Morrow Batteries aims to be the first company in the world to commercialize a battery operating with the LNMO technology as the active cathode material. Thanks to its special chemistry, LNMO will have a significantly lower cost and carbon footprint compared to batteries with a similar performance. In addition, the optimization of the electrolyte transporting positively charged ions between the cathode and anode terminals will enable to significantly improve the performance and competitiveness of this new generation of batteries.

*"We are pleased to partner with Morrow Batteries, one of the most innovative and ambitious scale-up companies in the European battery manufacturing landscape. Our collaboration paves the way for the commercialization of their cutting-edge battery technology based on LNMO and we are excited that it will have a part of Arkema inside",* said Armand Ajdari, Chief Technology Officer of Arkema.

Arkema recently inaugurated its Center of Excellence dedicated to batteries at Pierre-Bénite Research Center in Lyon (France) and is [accelerating its investments in this field](#). Employing world-class industrial process expertise, Arkema has developed high-purity Foranext® lithium salts that help significantly increase the power, stability, and lifetime of batteries.

*“Arkema is a world-leading supplier of PVDF binders for solvent-based, waterborne and dry processing, along with ultra-pure lithium salts to improve our cell performance. They are an excellent partner in our consortium of top-tier industry players to further optimize the performance of our high-voltage LNMO-based batteries”, said Rahul Fotedar, Chief Technology Officer of Morrow Batteries. “Even the most advanced electrolyte formulations on the market currently will not work in a battery containing LNMO and graphite. Arkema can today offer the next blockbuster lithium salts with the highest ionic conductivity that are extremely stable at the high operating voltage of LNMO, and this is improving our large format cell performance significantly.”*

This partnership will also explore the use of Arkema’s Kynar® CTO - a renewable PVDF grade with carbon derived from bio-feedstock using the mass balance approach - for the first generation of battery cells produced by Morrow. The next step is to develop water-based LNMO cathode manufacturing processes, enabled by Arkema’s Kynar® PVDF aqueous binders.

The common goal is to commercialize one of the world's most cost-effective and sustainable battery technologies and this world-leading technology has the potential to significantly reduce the cost of battery cells (20%) compared to the current level.

#### **About Arkema**

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 82% of Group sales in 2020, 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 €8 billion in 2020, and operates in some 55 countries with 20,600 employees worldwide.

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#### **About Morrow Batteries**

**Morrow** is building a highly cost-effective battery cell factory on the Battery Coast in the South of Norway with the aim to develop and industrialize new green and innovative battery technologies. Through a strong network of top-tier industrial leaders developing and manufacturing components for batteries, Morrow conducts system-level development of manganese-rich high-voltage cathode chemistries for commercialization with a 5-year horizon.

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