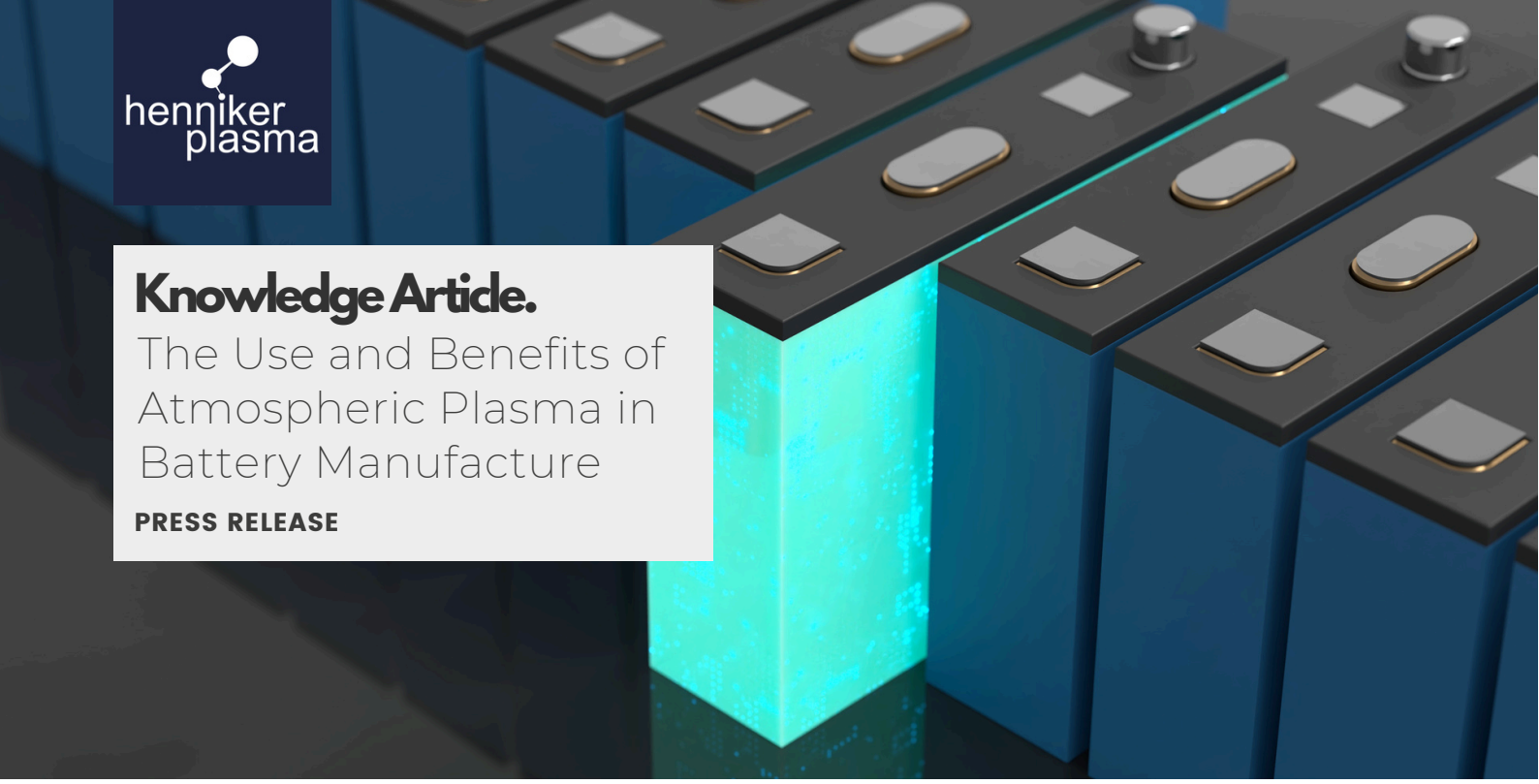


Knowledge Article.

The Use and Benefits of Atmospheric Plasma in Battery Manufacture

PRESS RELEASE

Advanced battery technology.

In the evolving landscape of battery manufacturing, atmospheric plasma technology has emerged as a valuable tool, enhancing various aspects of the production process. This advanced technology involves the use of ionized gas (plasma) at atmospheric pressure to treat surfaces, which significantly improves adhesion, cleanliness, and the overall performance of batteries.

Enhanced Adhesion and Surface Activation.

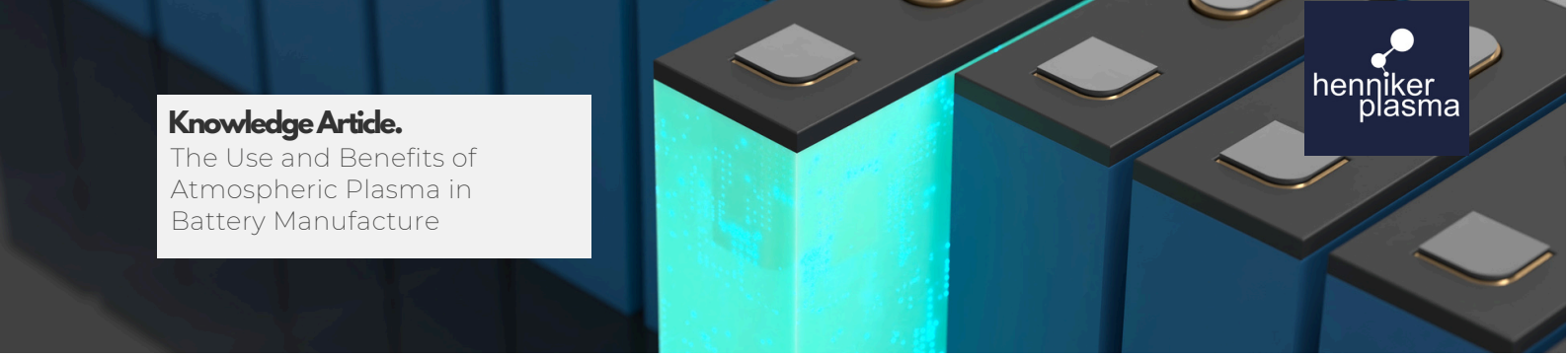
Atmospheric plasma treatment is particularly beneficial in the surface preparation stages of battery manufacturing. It cleans and activates the surface of battery components, promoting better adhesion of coatings and sealants. This improved adhesion is critical for the reliability and longevity of batteries, especially in applications where consistent performance is non-negotiable.

Cleaning and Contaminant Removal.

One of the major advantages of atmospheric plasma is its ability to clean surfaces at a microscopic level. The plasma treatment removes organic contaminants, oxides, and other residues that can impede the performance of batteries. This cleaning process is crucial in ensuring that the battery components are free from impurities that could cause failures or reduce efficiency over time.

Applications in Adhesive Bonding.

In battery potting, where components are encapsulated with protective materials to enhance durability and prevent leakage, atmospheric plasma treatment ensures that adhesives bond effectively. Specific adhesives like polyurethane and epoxy are commonly used in potting processes. The activation of surfaces by plasma treatment enhances the adhesion of these materials, resulting in more robust and reliable battery assemblies.



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Integration in Manufacturing Processes.

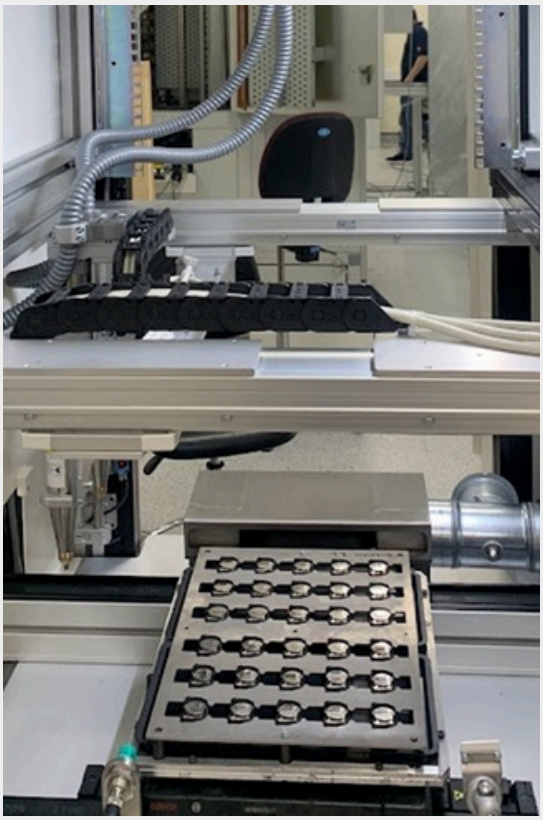
Henniker Plasma's Cirrus atmospheric plasma system exemplifies the integration of this technology into manufacturing lines. The Cirrus system delivers a continuous plume of active plasma gas, enabling precise and localized surface treatment. It is designed to be easily incorporated into existing production lines, with features like a user-friendly interface and compatibility with robotic handling systems, making it a versatile tool for modern manufacturing setups .

Specific Benefits for Battery Manufacturing.

- *Improved Adhesion: Enhanced bonding of electrode materials and separators.*
- *Enhanced Durability: Better potting and sealing of battery components.*
- *Increased Reliability: Cleaner surfaces lead to more consistent performance.*
- *Versatility: Effective on a wide range of materials including polymers, metals, ceramics, and glass.*

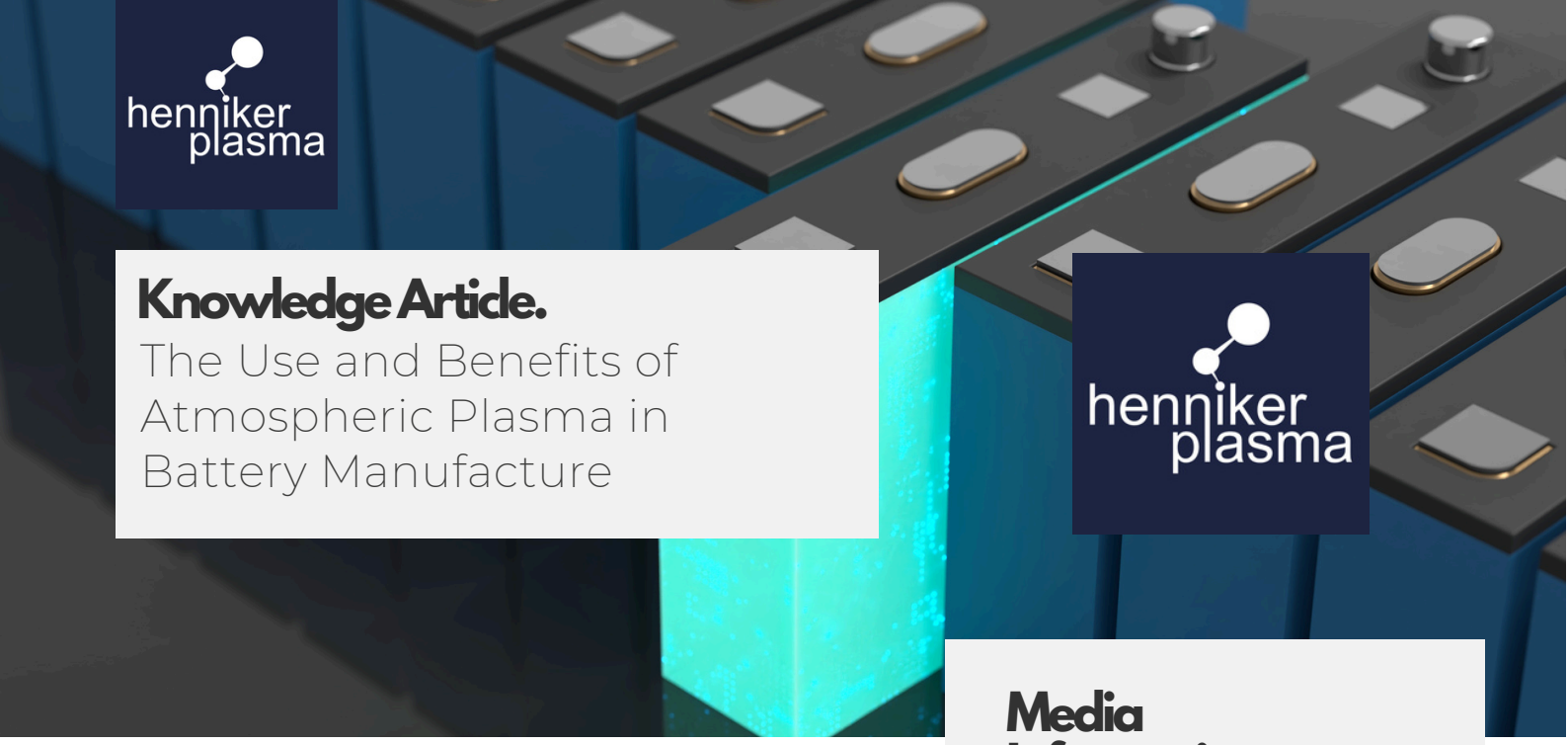
Henniker Plasma's Cirrus and Nimbus systems are noted for their ability to treat various materials with ease, ensuring high-quality surface activation and cleaning. The compact design and operational efficiency make them suitable for both small-scale applications and large production environments.

Example Installation.



The Nimbus System, installed in a production cell adaptable for both in-line and off-line operations, features two plasma nozzles mounted on a Cartesian axis system, cleaning 15 parts per pallet. Positioned just 5mm from the surface, the torches' cleaning path and speed were optimised via internally conducted Design of Experiments (DOE).

Operating on Ni-coated stainless-steel surfaces, the plasma effectively eliminates hydrocarbons, increases surface energy, and enhances adherences for all subsequent processes, such as potting compound application.



Knowledge Article.

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References.

For further detailed information about the Cirrus and Nimbus atmospheric plasma products and their applications, you can refer to the resources provided below:

Cirrus Model

Dual Atmospheric Plasma Torch

Atmospheric Plasma Robot

These references offer comprehensive insights into the capabilities and integration of atmospheric plasma systems in various manufacturing processes, highlighting the critical role of this technology in enhancing battery manufacturing.

Media Information.

For Immediate Release

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About Henniker Plasma.

Henniker Plasma is one of the leading manufacturers of plasma treatment systems for cleaning, surface activation to improve adhesion, and functional nano- scale coating.

Backed up by more than 20 years of experience, Henniker's innovative plasma treatment equipment is trusted globally in both critical industrial manufacturing settings to solve key adhesion challenges, and by leading academic research groups helping to support a wide range of fundamental research.

Henniker's advanced plasma systems are configurable tools that are both robust enough for reliable, repeatable industrial processing and at the same time flexible enough for the research into, and development of, leading-edge plasma processes. They transform materials, adding significant functionality and value.

For more information about Henniker Plasma visit: plasmatreatment.co.uk