
UniverCell

Content

Purpose 6-7
Vision 8-9
Passion 10-11
Company 12-13
History 14-15
The opportunity 16-17
Special applications 18-19
Extreme applications 20-21
Supply chain 22-23
21700 cells 24-34
High Energy 26-27
Heavy Duty 28-29
High Power 30-31
Customized cell solution 32-33
Tabless design 34
Cell development 35
Pouch cell 36-39
Pouch cell production 38-39
Electrodes 40-47
Pilot production 42-43
Mass production 44-45
Electrode finishing 46-47
Coating solutions 48-59
High-Nickel NMC cathode 50
LFP cathode 51
Graphite/Si anode 52
LCO, LMFP, LMNO, LTO, SIB 53
Aqueous LFP processing 54-55
Aqueous processing advantages 56-57
Dry coating 58-59
Research & development 60-63
From lab to mass production 62
Holistic cell development 63
Contact 64-65
Imprint 66


“The best way to
predict the future
is to invent it.”
— Alan Kay, computer scientist and pioneer of object-oriented programming



PURPOSE

UniverCell produces electrodes and battery cells for special applications, all made in Germany. With cutting-edge technology, superb production capabilities, and a world-class team, we accelerate the journey from initial concept to fully established products, which we then manufacture in the millions.

VISION

For a sustainable world powered by renewables, energy storage systems of exceptional **performance, stability, cycle life, safety and adaptability** are needed to satisfy the most complex and demanding end user applications.





PASSION

We are passionate about redefining energy storage. At UniverCell, our drive for **innovation, precision, and sustainability** powers every step — from lab to large-scale production. With expertise and curiosity, we create battery solutions that go beyond expectations.

COMPANY

Flintbek & Moorsee,
Kiel, Germany



HQ in Flintbek and newly established site in Moorsee, offices in the USA and South Korea.

2019

Founded

64,000 m²

Total facility size

1.5 GWh

Production capacity

approx. 100 employees

by 2025

HISTORY




2019

Founded
Flintbek, Germany
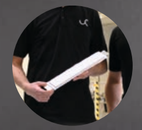
Started with R&D laboratory and pilot-production facility




2020

First electrodes

Producing and selling our first electrodes, made in Germany




2020

Pouch cell prototyping

Developing our first proprietary cells in pouch format

2021




Mass production of our pouch cells

With customizable chemistry



2022



Ramping up the mass production

Raising coating capacity to gigawatt-scale

International presence established

Additional offices in the USA and South Korea

2022



Today



Launch of cylindrical cell program

As new, versatile product line within our portfolio

2023



Cylindrical cell prototyping

Expanding our portfolio and hitting serial production

2024

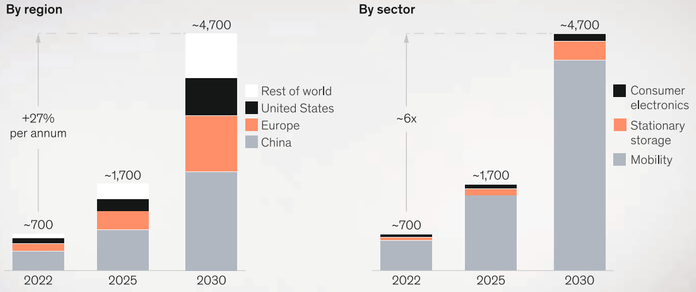
Acquiring new production facilities and vastly expanding
Moorsee, Germany

90 %

of manufacturers are focused on the high-volume automotive market, resulting in a shortage in other markets

The opportunity

Global Li-ion battery cell demand, GWh, Base case



[1]Including passenger cars, commercial vehicles, two-to-three wheelers, off-highway vehicles, and aviation.
Source: McKinsey Battery Insights Demand Model

McKinsey & Company

In scope of special applications

The global market demand forecast for lithium-ion batteries is expected to grow about 27 % annually to reach around 4,700 GWh by 2030.

The largest and fastest-growing market segment is electric vehicles (EVs). Both existing and emerging battery suppliers are focusing almost entirely on this segment.

There are no battery cell manufacturers in Europe that serve a variety of applications outside electric vehicles (EVs).

UniverCell fills the gap for cells in special application markets by producing mature and versatile cells in central Europe.

Highest quality for special applications

Flexibility in all demands

From high-power tools to energy-dense aviation needs — our products are engineered for maximum flexibility, safety, and performance. Whether it's e-mobility, medical devices, or long-life energy storage, we develop customized solutions to meet the specific challenges of your industry and application.



Power tools

High-power applications require high output currents with short charging times and moderate energy density.



E-Mobility

Cells with the highest performance and safety requirements, e.g., mobility, sports cars, and e-bikes.



E-Aviation

High-energy cells for applications in need of the highest energy densities combined with a high safety range.



Medicine

Markets with special needs for cells with the highest quality and safety requirements.



Special vehicles

Cells tailored for vehicles with unique performance profiles – such as construction machinery, agricultural equipment, or emergency vehicles.

When even the sky is no limit: Extreme use cases

From arctic cold to high-vibration environments, our cells are engineered to perform where standard batteries fail.

UniverCell delivers robust, high-performance solutions tailored for demanding use cases — ensuring reliability, safety, and longevity even under the toughest conditions.



Battery solutions for extreme applications

Power under pressure

Temperature Extremes

Reliable operation in both intense heat and freezing cold – from arctic expeditions to desert deployment.

Vibration & Shock Resistance

Mechanically robust cell designs for use in aviation, defense, maritime systems, or rugged terrain vehicles.

Weight & Space Constraints

Maximum energy in minimum space – perfect for satellites, portable systems, and airborne technologies.

High Power Demand

Fast charging and discharging with high current loads – ideal for drones, hybrid drives, and power tools.

Long Lifetime & High Cycle Stability

Thousands of charge cycles with minimal capacity loss – key for stationary storage, critical infrastructure, and long-term field use.

Harsh Environmental Conditions

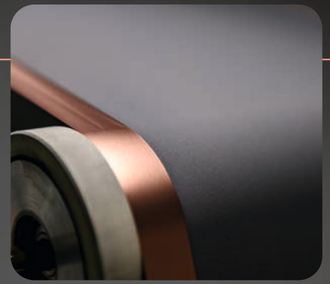
Corrosion-resistant, suited for moisture, salt, and chemically aggressive surroundings – perfect for offshore or coastal applications.

Sustainable supply chain within Europe



Slurries

Slurries are tailored to meet the highest safety and quality demands — especially when sensitive or critical raw materials from, but not limited to, Europe, are required, such as in medical, marine, or defense applications.



Electrodes

Electrode production and finishing are exclusively done in Germany. Harmful solvents, such as NMP, are either substituted with water or collected for local recycling.



Cells

Cell assembly also takes place in Germany. Critical materials, such as nickel and cobalt, are recycled by local partners to re-enter the battery production chain.

Products

A brief overview of our product portfolio



The 21700 UniverCells

UniverCell's 21700 lithium-ion cells are engineered to deliver superior energy density, outstanding cycle life, and exceptional safety.

Our tabless design features maximum power performance while ensuring exceptional thermal behavior.

By selecting next-generation battery cell materials, they are designed for demanding future applications and maximum flexibility – made in Germany, ready for the world.

Nominal voltage

3.6 V

Typical capacity

6.0 Ah

Cycle life*

> 750



UniverCell High Energy

UC2170-HE

The UniverCell high-energy cell enables highest performance. Its innovative tabless design pushes cell capacity to market leading 6.0 Ah while keeping excellent power performance.

Cell data

Values	UniverCell HE
Capacity (C/10)	6.0 Ah
Weight	62 g
Current const.	12.5 A
Current peak	35.3 A
Energy density vol.	890 Wh/L
Energy density grav.	350 Wh/kg
Place of production	Germany



* 1C/1C, 100 % DoD

The displayed data are SOP target values and do not imply a performance guarantee or a product warranty. Specifications and characteristics are subject to change.

Nominal voltage

3.2 V

Typical capacity

3.0 Ah

Cycle life*

> 3,000



UniverCell Heavy Duty

UC2170-HD

The UniverCell heavy-duty cell delivers outstanding performance under extreme conditions. The electrodes are designed to deliver exceptional energy output over a very long time. By combining ultra-safe LFP chemistry with an innovative tabless design, the best of both worlds comes together - safety and performance.

* 1C/1C, 100 % DoD

Cell data

Values	UniverCell HD
Capacity (C/10)	3.0 Ah
Weight	58 g
Current const.	11.2 A
Current peak	22.5 A
Energy density vol.	395 Wh/L
Energy density grav.	165 Wh/kg
Place of production	Germany



The displayed data are SOP target values and do not imply a performance guarantee or a product warranty. Specifications and characteristics are subject to change.

Nominal voltage

3.6 V

Typical capacity

5.0 Ah

Cycle life*

> 750



UniverCell High Power

UC2170-HP

The UniverCell high-power cell is loaded with a cutting-edge tabless design and advanced electrode architecture. This innovative cell delivers exceptional power output without compromising capacity. Its industry-leading heat distribution technology ensures optimal thermal management, making it a powerhouse of efficiency.

* 1C/1C, 100 % DoD

Cell data

Values	UniverCell HP
Capacity (C/10)	5.0 Ah
Weight	62 g
Current const.	50.4 A
Current peak	79.8 A
Energy density vol.	740 Wh/L
Energy density grav.	290 Wh/kg
Place of production	Germany



The displayed data are SOP target values and do not imply a performance guarantee or a product warranty. Specifications and characteristics are subject to change.

Customized cells on demand from lab scale to gigafactory production

The UniverCell solution



Standardized format

21700 is the state-of-the-art dominant cell type



Customized chemistry

Tailored with a unique chemistry



Dry coated electrodes

Boosts energy density and sustainability

Competitive edge

- Energy density
- Durability
- Lifetime
- Safety



One cell design for all applications

Aiming for 1.3 GWh annually, equivalent to 85,000,000 cells a year

Tabless design

Tabless design

More compact design & greater flexibility

Our 21700 lithium-ion cells leverage a tabless design combined with UniverCell's proprietary advanced cylindrical cell architecture to deliver outstanding performance. The 21700 format offers increased capacity and power density while maintaining a compact footprint — resulting in a market-leading gravimetric energy density — ideal for applications where low weight and maximum energy are critical. With superior thermal management and minimal internal resistance, our 21700 cells ensure efficient current flow and reduced heat generation under challenging conditions. Engineered and produced in Germany, these cells are the perfect choice for demanding applications, ranging from power tools to aerospace and spaceflight missions — setting new standards in energy density, durability, and innovation.



Cell development

Tailored solutions from concept to series production

We support our customers throughout the entire cell development process—from initial design to validated prototypes and scalable production. Whether cylindrical or pouch format, we assemble lithium-ion cells using customer-specified or proprietary components, precisely adapted to application requirements. With several years of hands-on experience in electrode development, cell assembly, and process optimization, we ensure efficient prototyping and a smooth transition to industrial-scale manufacturing. All prototypes are rigorously validated in our in-house formation and testing center, where performance, cycle life, and safety are tested under application-relevant conditions — delivering reliable data and a solid foundation for market-ready energy storage solutions.



UniverCell‘s pouch cell

Stacking maximum performance



Completely individual cells

Cells can be customized entirely for customer demands with consistent quality

The pouch cell

UniverCell’s pouch cells are designed for flexibility in shape, capacity, and performance. Their light-weight, compact form allows for tailor-made solutions in applications with specific spatial or energy requirements.

Using advanced stacking techniques and custom chemistries, we achieve outstanding cycle life, safety, and energy density — making our pouch cells ideal for high-end mobility, aerospace, and stationary storage systems.

Pouch cell production

From lab scale to mass production





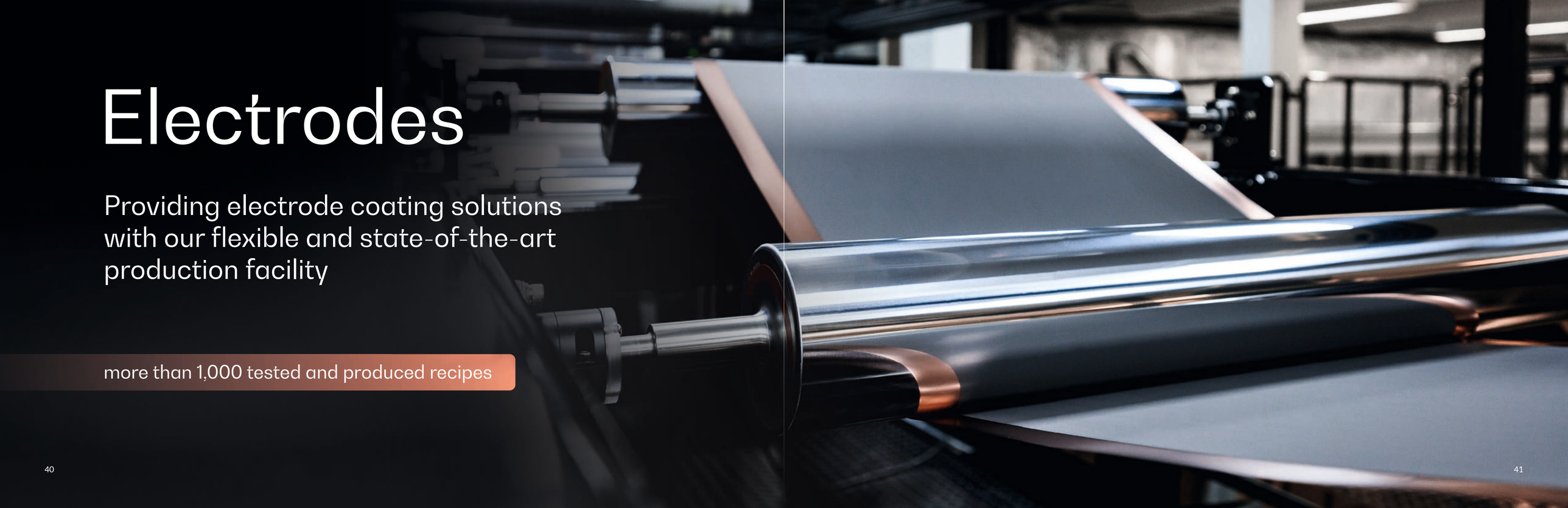


Cell assembly line capable of 1.2 million pouch cells per year.

Electrodes

Providing electrode coating solutions with our flexible and state-of-the-art production facility

more than 1,000 tested and produced recipes





Pilot production

Flexible line for processability testing

UniverCell's pilot production line is the critical interface between research and mass production. It allows us to develop, test, and refine new materials, chemistries, and processes under conditions that closely replicate industrial-scale manufacturing.

This line provides the flexibility to validate electrode formulations, optimize coating and drying parameters, and assess scalability — all without interrupting serial production.

It also enables customer-specific prototyping: whether developing a novel cell design, testing unconventional chemistries, or adapting to unique form factors, our pilot line ensures that innovations are production-ready before full-scale rollout.



Output: up to 2,000 m/day



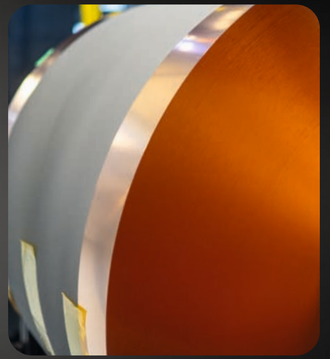
Mass production

For gigawatt scale production

Our mass production line is built for industrial-scale manufacturing. With a capacity of 30,000 meters per day, it enables high-throughput coating and cell assembly — while maintaining tight quality control at every step.

Designed for flexibility and reliability, the line accommodates a range of cell formats and chemistries, supporting everything from niche applications to large-volume series. Whether for energy storage, e-mobility, or aviation, we scale production without compromising on safety, performance, or consistency.

Automated systems, in-line monitoring, and robust process engineering ensure stable output and fast response to evolving customer demands — all made in Germany.



Output: 30,000 m/day

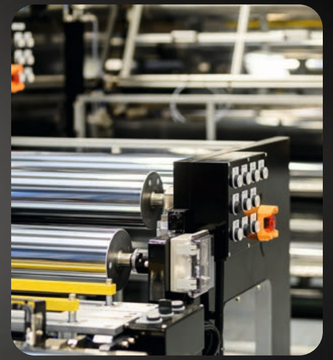
Electrode finishing

State-of-the-art calendering equipment

Our state-of-the-art calendering and cutting systems ensure optimal electrode performance and consistent quality at industrial scale. With an output of over 50,000 meters per day, we combine speed with precision in every step.

During calendering, electrode surfaces are compacted to achieve exact thickness, porosity, and mechanical strength — crucial for maximizing energy density and lifetime. Precise cutting processes then shape each electrode to match cell design requirements with minimal material loss.

Both steps are fully integrated into our production line, allowing us to deliver high-performance electrodes tailored to specific customer needs — ready for assembly at any scale.



Output: >50,000 m/day

Coating solutions portfolio

Offering a wide selection of material- and coating solutions for individual products





High-Nickel NMC cathode

Introducing one of the most advanced lithium-ion cathode materials: Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO2), or NMC. Renowned for its balanced performance, high specific energy, and minimal self-heating, NMC is the top choice for a variety of applications. With a nickel content exceeding 80%, it offers even greater energy density.



LFP cathode

Our LFP (Lithium Iron Phosphate) cathodes offer outstanding thermal stability, long cycle life, and enhanced safety—making them ideal for applications where reliability matters most. With no cobalt or nickel, LFP is also a more sustainable choice for modern battery solutions.



Graphite/Si anode

Our advanced anode features up to 80% silicon content, providing twice the capacity of standard graphite anodes. This significant improvement enables access to higher energy densities, making it ideal for applications requiring higher energy and enhanced performance. Moreover, our silicon-enhanced anode demonstrates excellent durability, maintaining performance for over 750 cycles, which is exceptional for a silicon content of this magnitude.

... and many more!

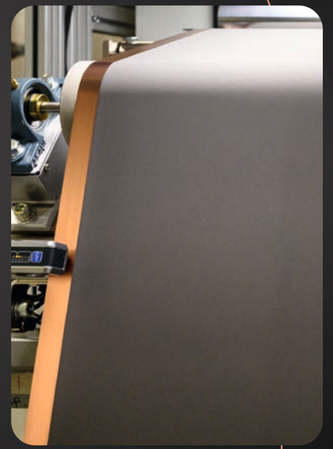
LCO, LMFP, LMNO, LTO, SIB ...

We take individual approaches seriously.

UniverCell uses individual chemical mixtures, active materials and additives optimized for the particular use and application requirement.

We work with the latest electrochemical materials. Furthermore, our Sales and R&D team have many years of material know-how and provide qualified services for realizing the desired requirements for the electrodes.

Electrode foils are coated according to your individual requirements, which are taken into account from the very first day of development. Coating materials, process details and product specifications are adapted to your specific application as part of our flexible electrode production.



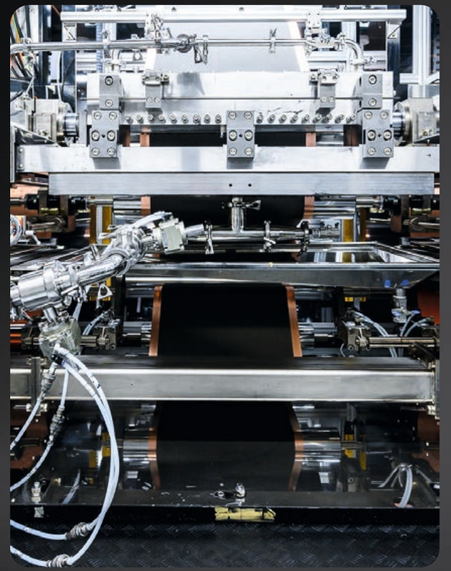
Water-based. Performance-driven.

Striving for an eco-friendly and cost-effective cathode without compromising performance



Offering wide advantages over conventional NMP-based coating

At UniverCell, we have developed a process for water-based LFP coating. Without the addition of organic solvents, our aqueous LFP cathode outperforms conventional NMP-based LFP electrodes. We have fully vertically integrated the process, using conventional materials and state-of-the-art equipment. Witness firsthand the exceptional performance of the most sustainable LFP cathodes on the market. Available in all volumes.



Lower manufacturing costs & higher production speed

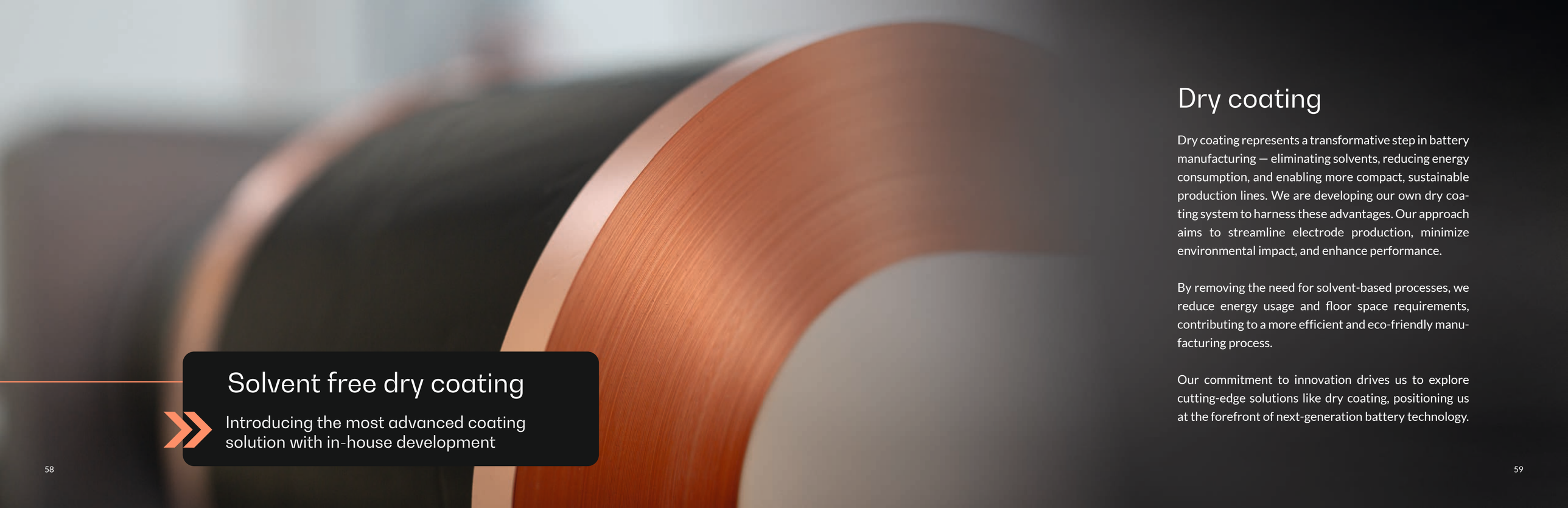
By removing NMP post-combustion or NMP recovery, the process costs are significantly reduced. The water-based process also requires less energy, as drying temperatures can be lowered. Furthermore, the need for additional protective measures throughout the toxic NMP processing chain is eliminated. Solvent-free product waste is also more economical to dispose of and recycle.

NMP has a higher boiling point than water. By using water, we are able to significantly reduce the drying temperature and increase the processing speed at the same time.



Sustainable process & lower toxicity

Our process overcomes the challenges of conventional cathode coating by replacing toxic NMP with water as a solvent. This allows us to dispense with environmentally harmful processes such as NMP post-combustion or NMP recovery. In addition, we do not use any fluorinated binders but materials that are free from hazardous ingredients. NMP is listed as a CMR substance (carcinogenic, mutagenic or toxic to reproduction). NMP can be readily absorbed through the skin or via inhalation. The use of NMP solvent necessitates specialized equipment throughout all processes to safeguard workers from exposure. Processing with water reduces protection requirements to a minimum.



Solvent free dry coating

Introducing the most advanced coating solution with in-house development

Dry coating

Dry coating represents a transformative step in battery manufacturing — eliminating solvents, reducing energy consumption, and enabling more compact, sustainable production lines. We are developing our own dry coating system to harness these advantages. Our approach aims to streamline electrode production, minimize environmental impact, and enhance performance.

By removing the need for solvent-based processes, we reduce energy usage and floor space requirements, contributing to a more efficient and eco-friendly manufacturing process.

Our commitment to innovation drives us to explore cutting-edge solutions like dry coating, positioning us at the forefront of next-generation battery technology.

Research & development

UniverCell uses individual chemical mixtures, active materials and additives optimized for specific use and application requirements.





From lab to mass production: customized electrode solutions

In the R&D laboratory, the focus is on advancing high-performance electrodes tailored to specific customer needs. Different mixers are available to prepare water- and NMP-based slurries on a laboratory scale. These formulations are carefully optimized for processability, slurry properties, mechanical stability, and electrochemical performance, with the goal of meeting the demands of pilot-scale production and ensuring a smooth transition from lab to larger-scale manufacturing.



Holistic cell development: from first concept to scalable production

Our process begins with transforming your initial idea into a tailored concept, designed specifically to meet your technical and commercial goals. We formulate and optimize slurries, rigorously tested in our in-house laboratories to ensure consistency and performance. From there, we move to electrode production and cell prototyping, refining every detail to achieve optimal results. Our state-of-the-art formation and testing center enables us to generate high-quality, reliable data that drives decisions and accelerates development.



Get your project started today!

Our team is here to support your project from day one — ready to answer questions and drive solutions forward.

Contact us: contact@univercell.group

Imprint

UniverCell Holding GmbH
Konrad-Zuse-Ring 1
24220 Flintbek
Germany

Entry in
Handelsregister

Register Number
HRB 22333 KI

Register Court
Amtsgericht Kiel
Represented by
Dr. Stefan Permien,
Marius Strack

Contact
Phone: +49 (0) 157 80 61 99 54
E-Mail: contact@univercell.group

Qualitätsmanagement
ISO 9001
www.dekra-siegel.de
DEKRA
zertifiziert

We foster the economy

EU.SH

Regional Economic Programme: Funded by the European Union - European Regional Development Fund (ERDF), the Federal Government and Land Schleswig-Holstein

Schleswig-Holstein. Germany's True North.

Follow us on LinkedIn

https://www.linkedin.com/company/19176792/

Let’s energize the future

UniverCell
www.univercell.group
contact@univercell.group

Konrad-Zuse-Ring 1, 24220 Flintbek, Germany

© 2025 UniverCell Holding GmbH – All rights reserved