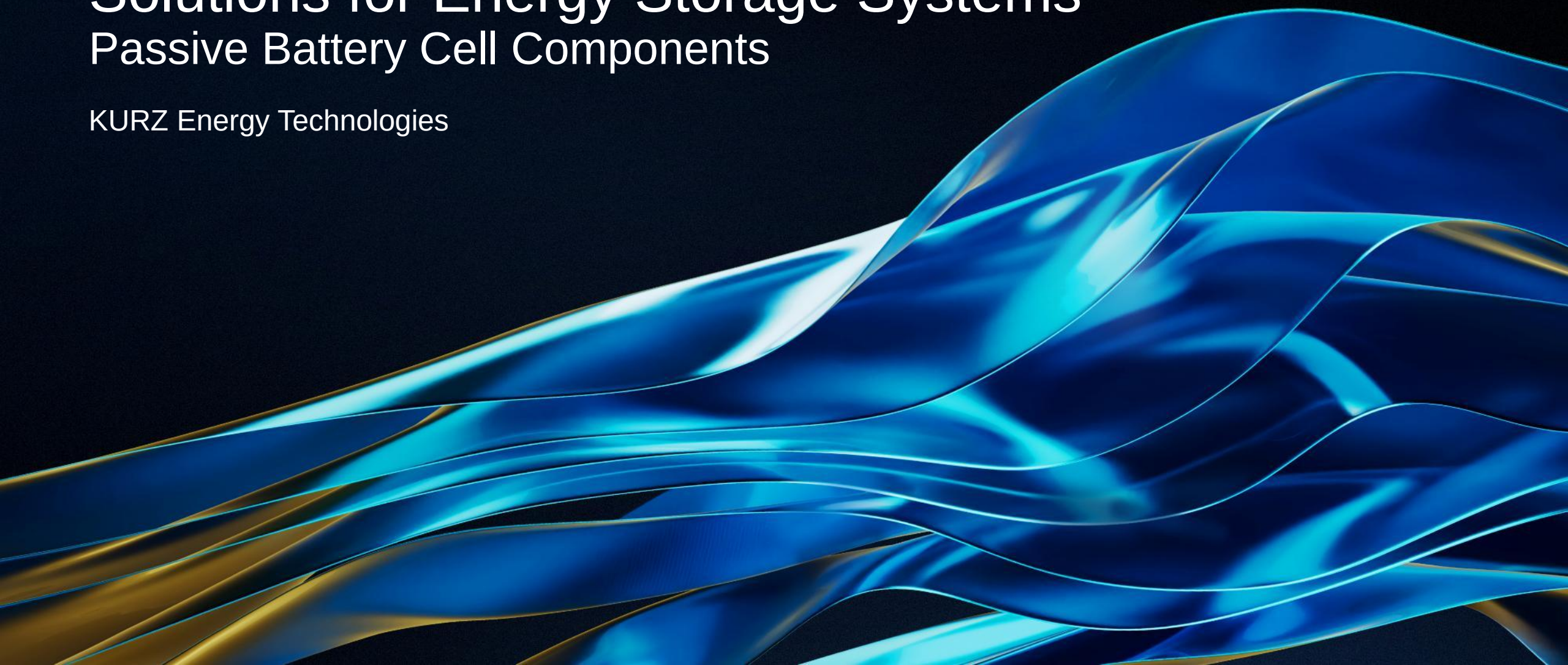


Solutions for Energy Storage Systems

Passive Battery Cell Components

KURZ Energy Technologies



KURZ Group

A Complete Solution Provider

Family run business **since 1899** (5th generation)

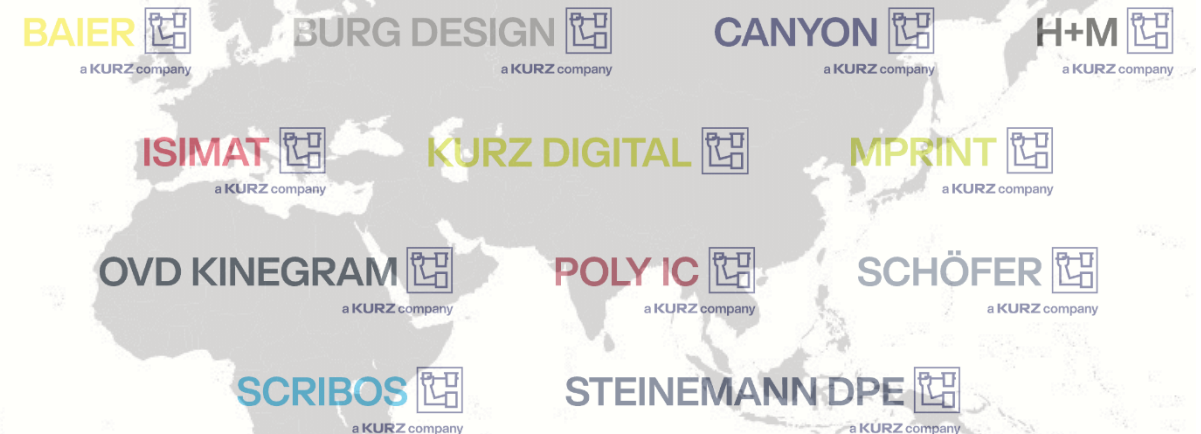
Global leader in thin-film technology

Supplies **worldwide leading** products for surface finishing, decoration, labeling, and counterfeit protection

Over **6,000 employees**

Global presence in more than **30 locations**

Manufactures in **Europe, Asia** and the **USA**



KURZ Industries

Smart, Award Winning, Creative

Automotive



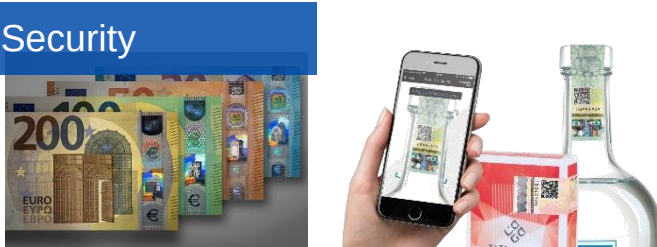
Graphics & Packaging



Appliances



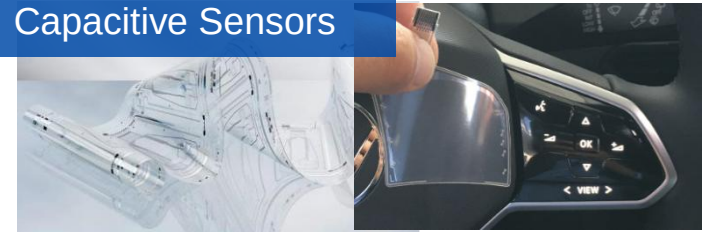
Security



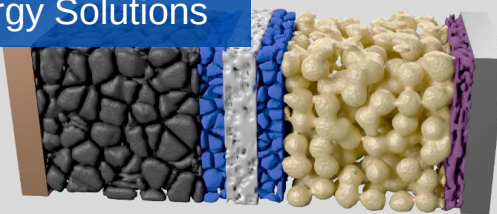
Card technology



Capacitive Sensors



Energy Solutions



Construction

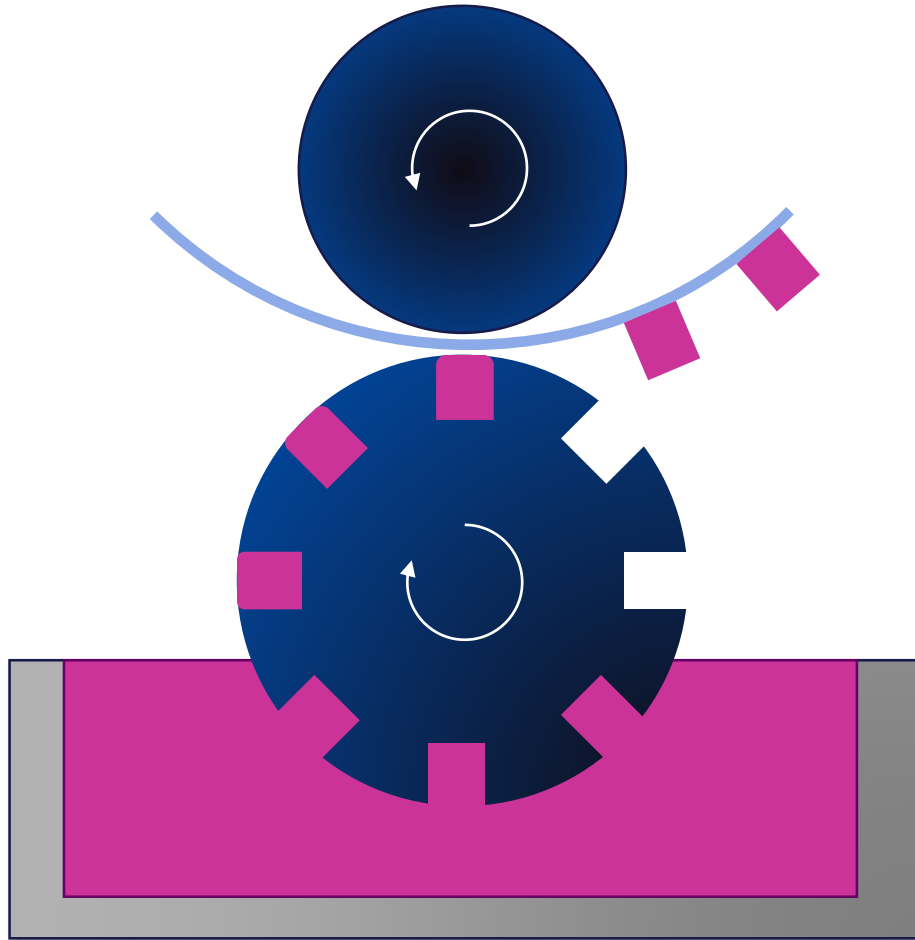


Smart Surfaces



KURZ - Facts

Gravure Printing



Printing



Structuring



Coating



Metallization / PVD



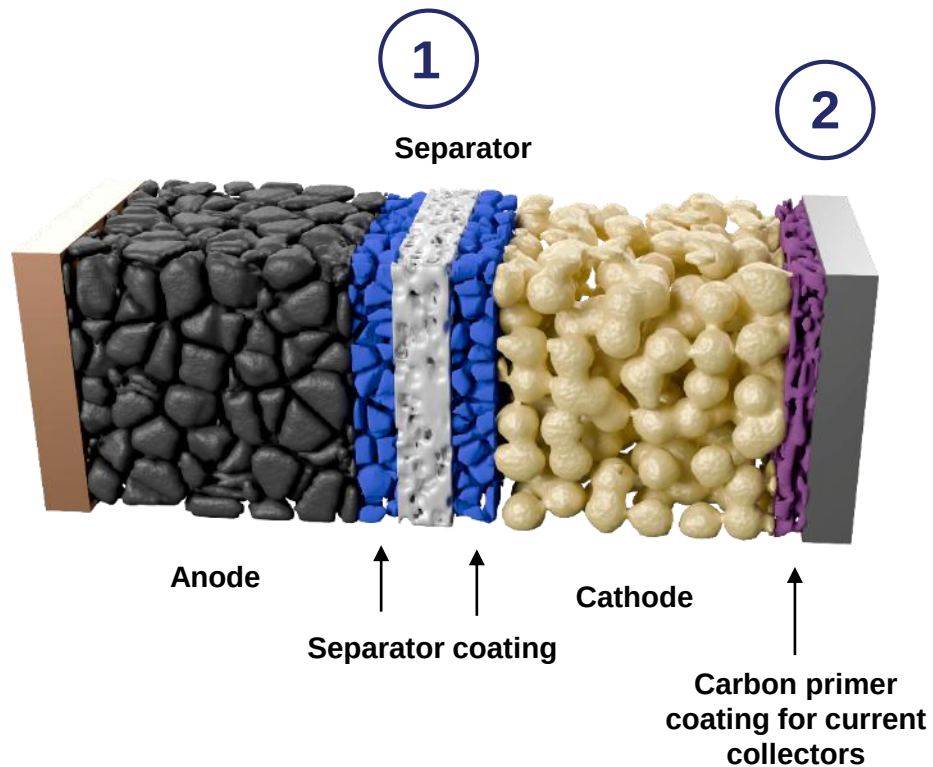
- Production speeds up to **800 m/min**
- Roll widths up to **2600 mm**
- **> 1.6 billion m²** annual coated foil production

Battery Cell Components:
Coated Separators

KURZ – Energy Technologies

Foil Solutions for Energy Storage Applications

Functionalization of surfaces and interfaces for Li-ion battery components



1 Coated separators



2 Carbon primer coated current collectors

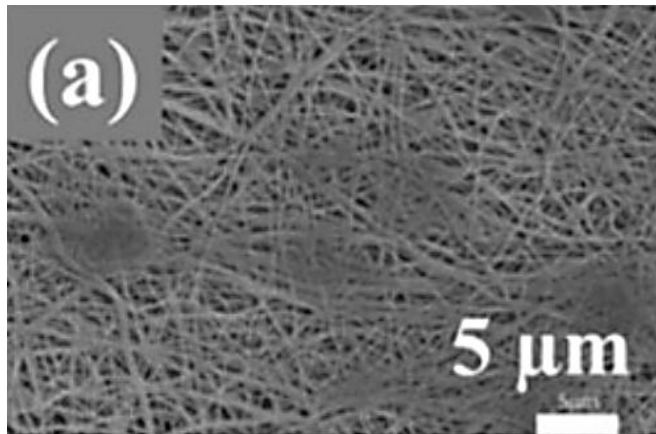


Horizon-Kurz New Material Technology

Types of Separators

Non-woven/
Fibre

Glass fibre / Paper

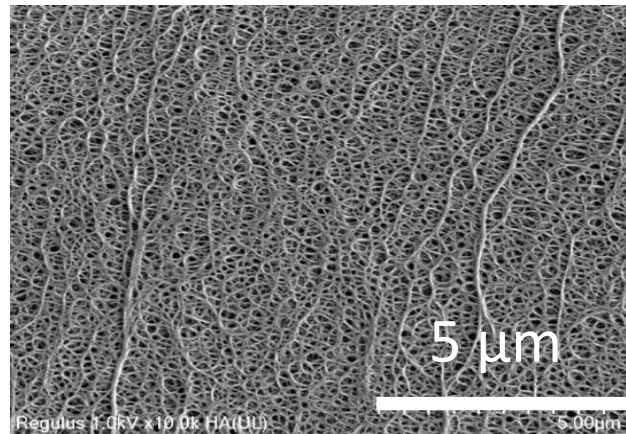


[R. Fazaeli, ACS Omega, 2025, 104]

Polyolefin-based film separators

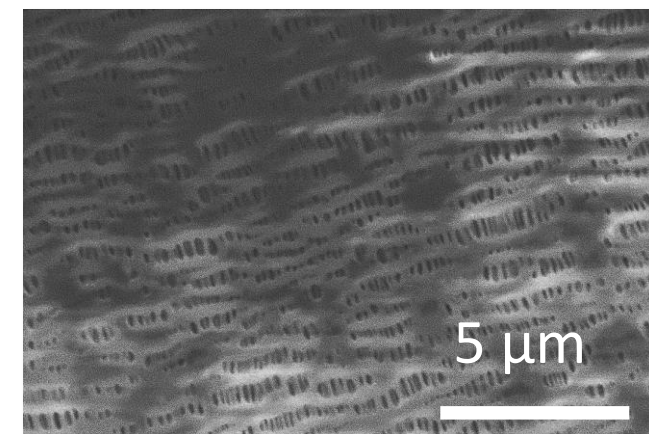
Wet-type

Polyethylene (PE)



Dry-type

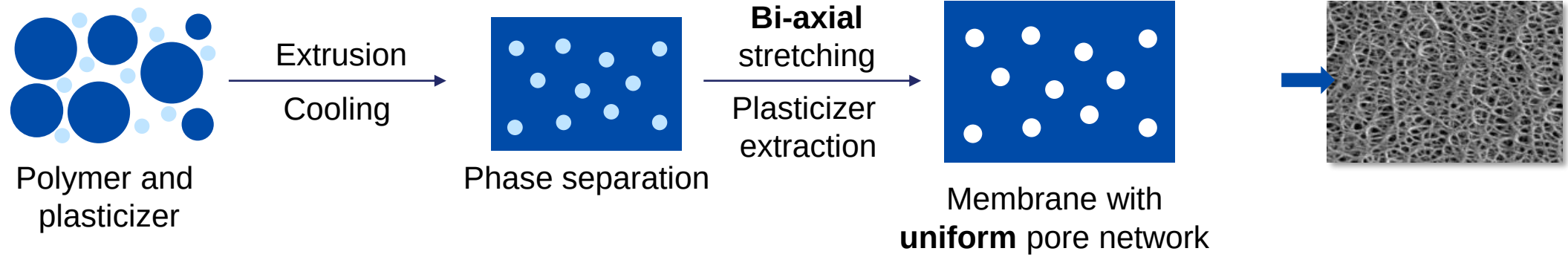
Polypropylene (PP)



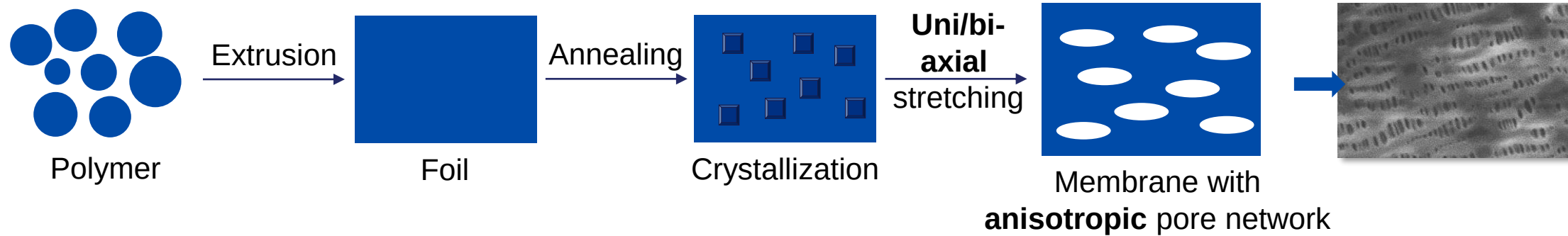
Horizon-Kurz New Material Technology

Separators Production

Wet process



Dry process



Horizon-Kurz New Material Technology

Joint-Venture of Jiangsu Horizon & Kurz Energy

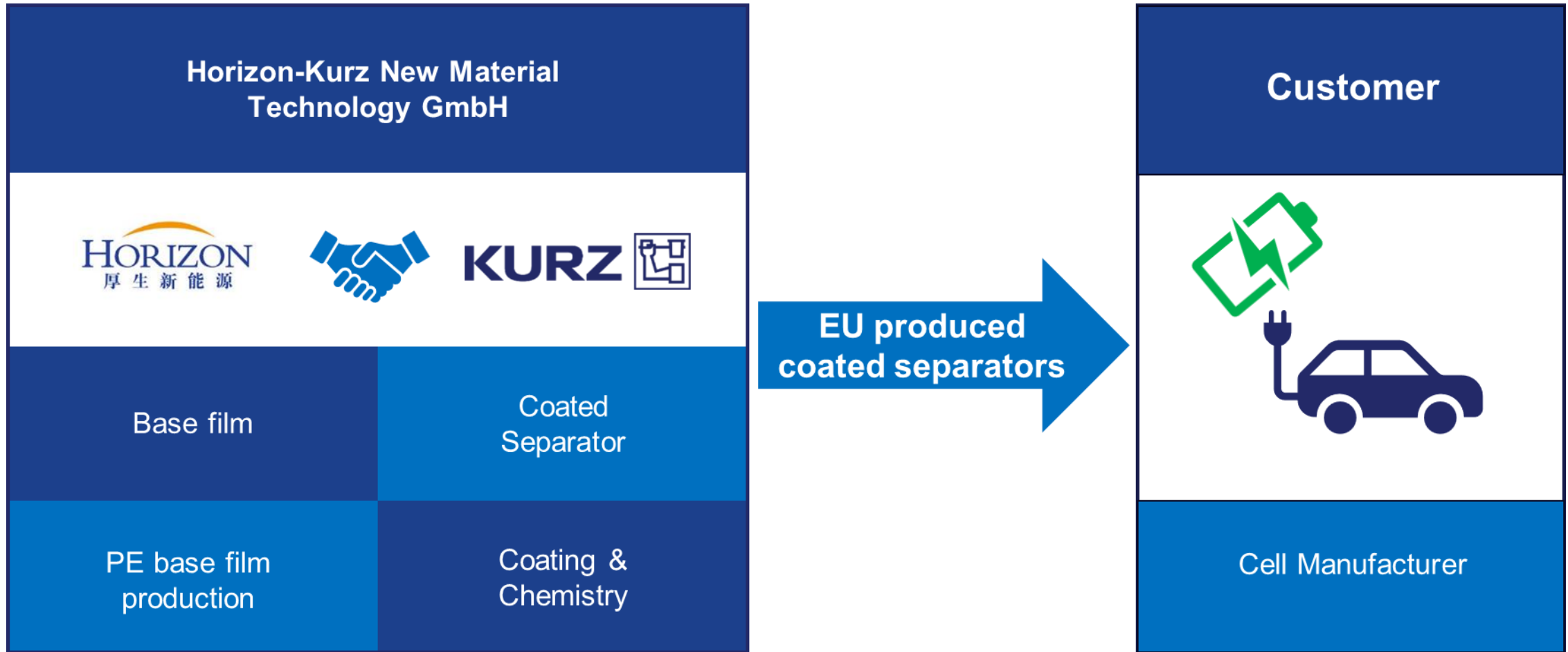


- World leading supplier of battery separator film
- Established in Jintan, Changzhou City, Jiangsu Province in 2017
- Over 3 billion m²/a base film production capacity
- CATL supplier since 2020



Horizon-Kurz New Material Technology

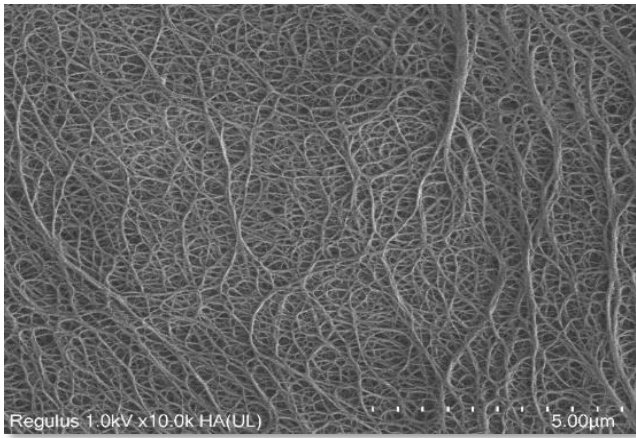
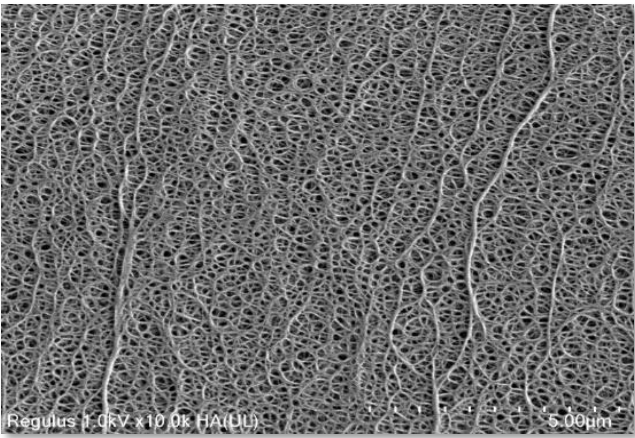
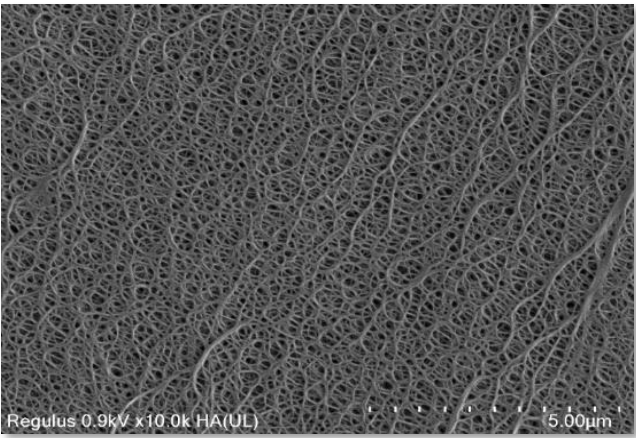
Joint-Venture – Coated separator films made in Europe for Europe



Horizon-Kurz New Material Technology

Base Film – Available Grades

Thickness		5µm	7µm	9µm	12µm	16µm	20µm	25µm
Performance	Standard	○	○	○	○	○	○	○
	High porosity	○	○	○	○	○	○	○
	High strength	○	○	○	○	○	○	○



Horizon-Kurz New Material Technology

Advantages of Coated Separator Films

Ceramic: Boehmite $\text{AlO}(\text{OH})$, Alumina Al_2O_3
Adhesive layer: PVDF, PMMA

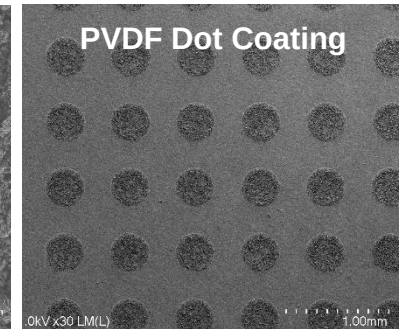
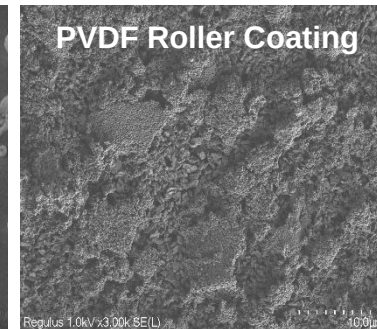
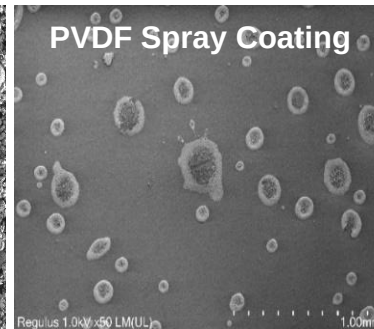
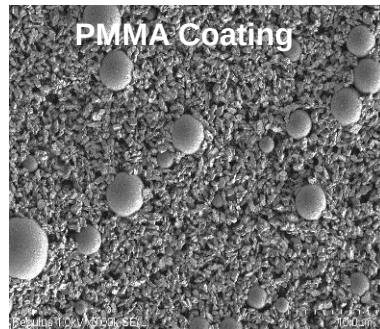
- Higher thermal stability
 - Improved electrolyte wetting
 - Higher safety against Li metal dendrites
 - Improved mechanical stability
- Longer cell life-time and better performance



Horizon-Kurz New Material Technology

Coated Seperator Products

Coating type	Coating thicknesses	Performances	Applications
Ceramic (Alumina)	Base film + 2/3/4μm	Heat resistant	High Capacity (HC) and High Safety (HS)
Ceramic (Boehmite)	Base film + 2/3/4μm	Heat resistant	HC and HS
Ultra thin ceramic	Base film + 1-2μm	Heat resistant	HC, HS and High Rate (HR)
PVDF	Base film + 1-3μm	Adhesion	Pouch
Ceramic + PMMA	Base film + 2/3/4μm Ceramic + 2-5μm PMMA	Heat resistant + Adhesion	HC, HS, PFAS-free
Ceramic + PVDF	Base film + 2/3/4μm Ceramic + 1-3μm PVDF	Heat resistant + Adhesion	HC, HS (Pouch/Prismatic)

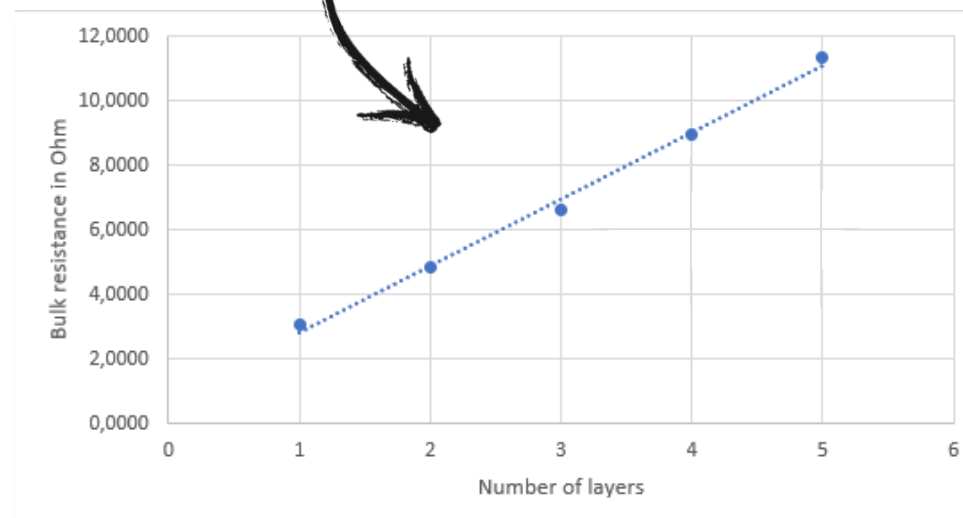


Horizon-Kurz New Material Technology

Separator Testing

Important separator foil characteristics

- Thickness
- Area weight
- **Gurley** (air permeability)
- **MacMullin Number** (ion conductivity)
- **Electrical breakdown voltage**
- **Thermal shrinkage** (105/120/130 °C)
- **Puncture strength**
- **Moisture**
- Strength & Elongation (MD & TD)
- Coating peel strength



MacMullin number: around **9-10** for coated separators

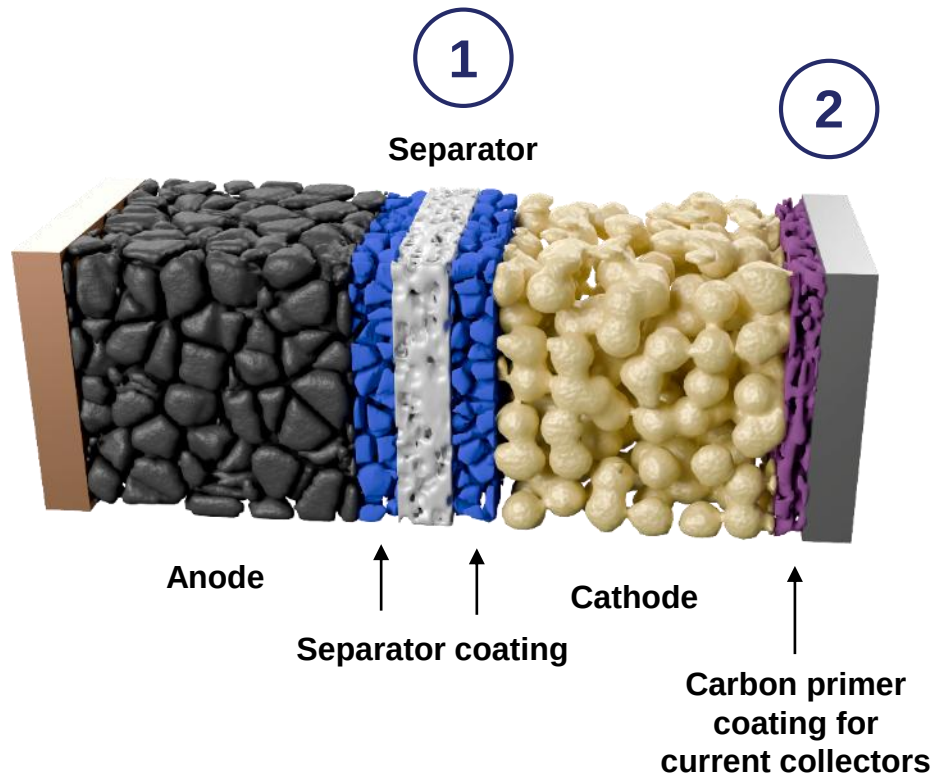
Battery Cell Components:

**Carbon Primer Coated
Current Collectors**

KURZ Energy Technologies

Foil Solutions for Energy Storage Applications

Functionalization of surfaces and interfaces for Li-ion battery components

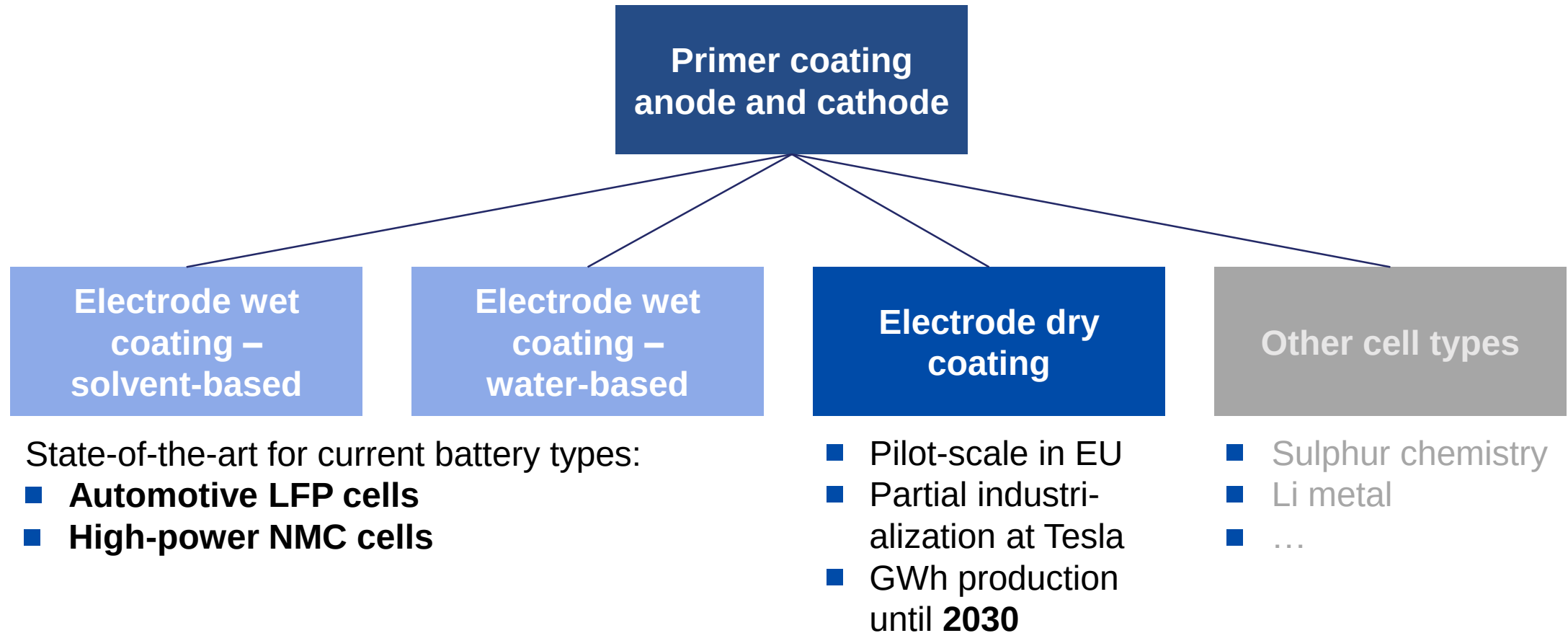


1 Coated separators



2 Carbon primer coated current collectors



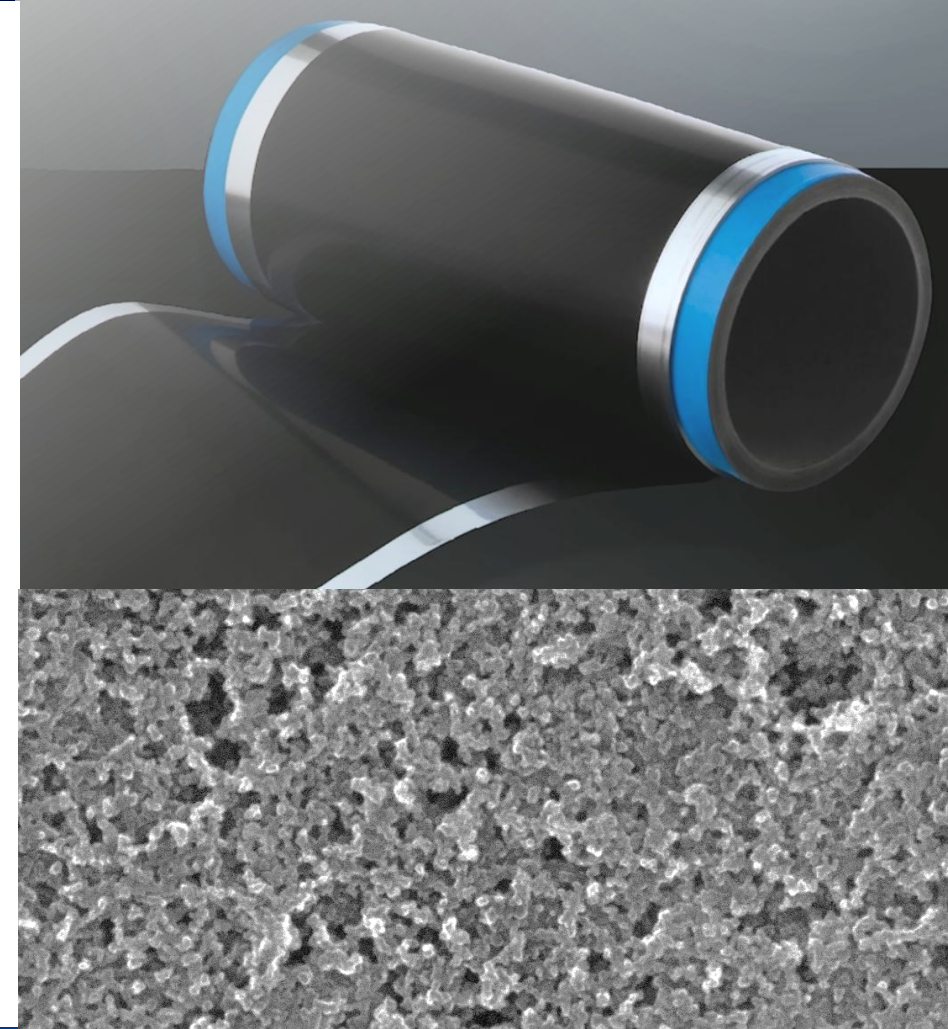


Horizon-Kurz New Material Technology

Advantages of Coated Current Collectors

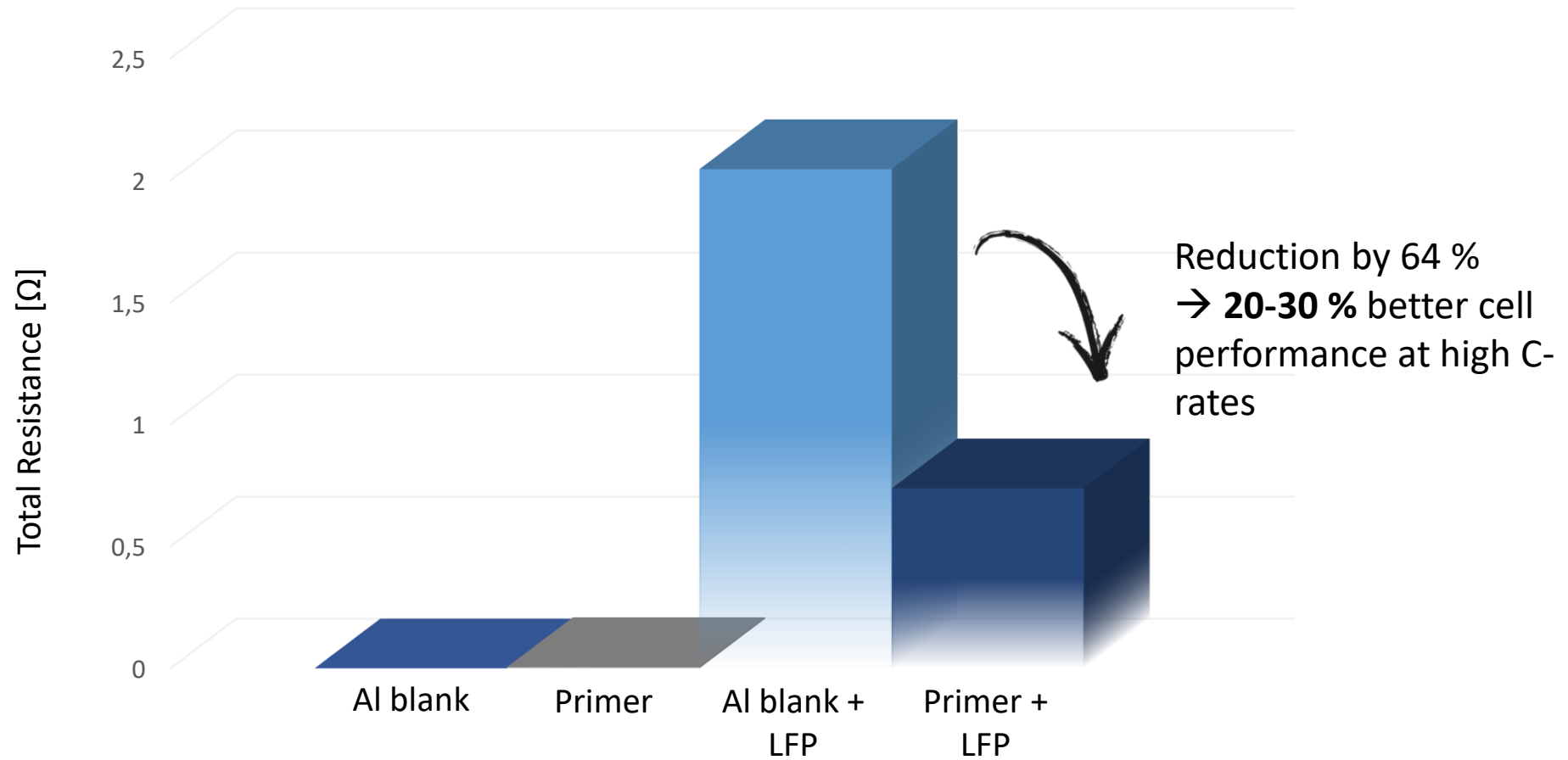
Conductive pigment: conductive carbon, graphite, graphene, CNTs

- Lower internal resistance / faster charging
 - Better adhesion
 - Corrosion protection
 - Lower conductive carbon content in the electrode
- Longer cell life-time and better performance



KURZ Energy Technologies

Total Resistance w/ LFP electrode



KURZ Energy Technologies

Carbon Primer Chemistries & Status

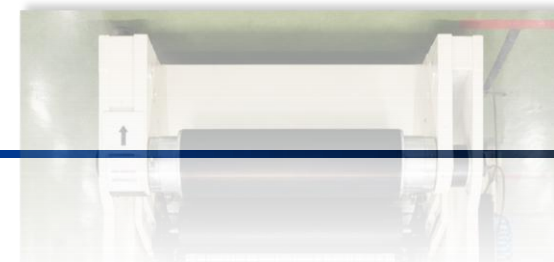
■ Primer for solvent/water-based wet-coating (available)

- Chemistry ✓ developed
- Production scale testing ✓ finished
- Functionality ✓ proven in cell tests
- Roll-to-Roll samples ✓ available

■ Primer for dry-coating (under development)

■ Production status:

- Pilot-production line → available
- Upscaling production line → 2026/27

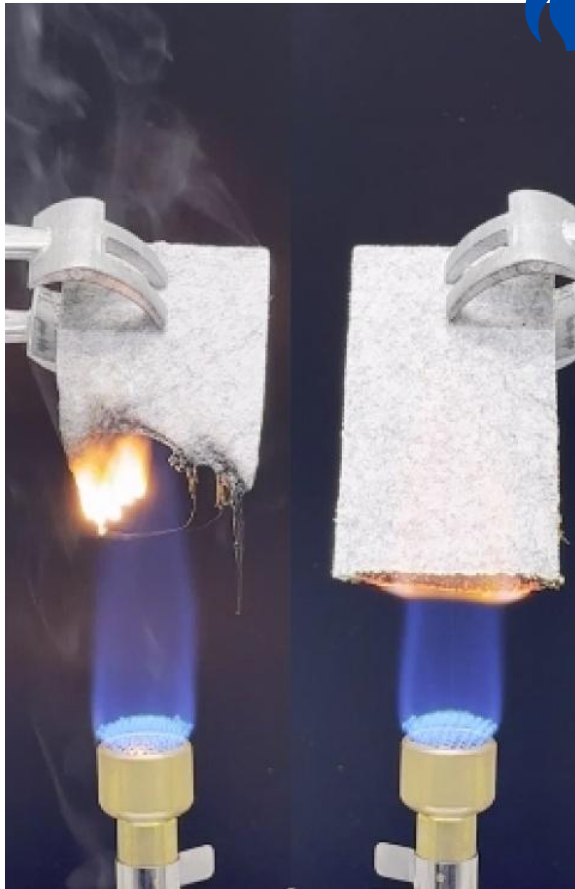


Additional Battery Solutions

KURZ Energy Technologies

Additional Battery Solutions

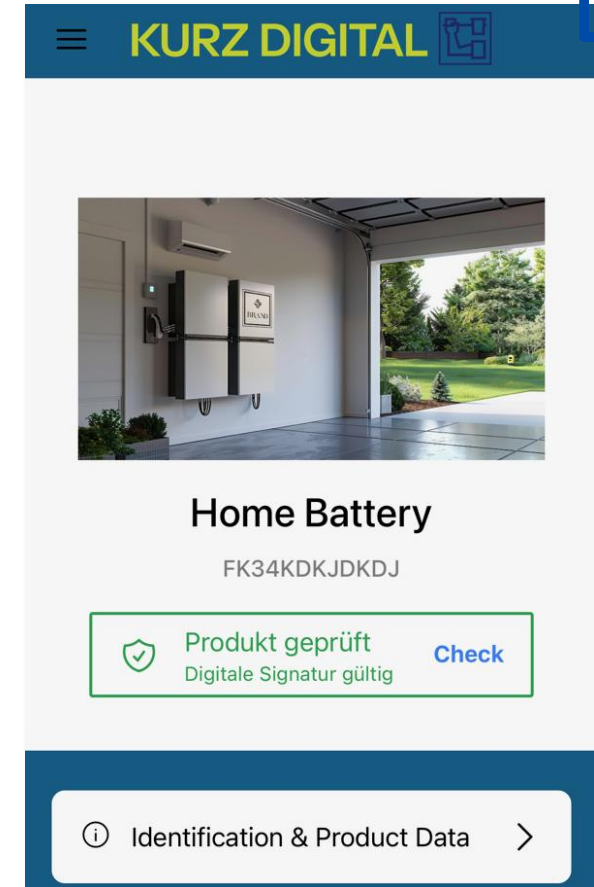
Flame protection



EMI Shielding



Battery Pass



Thank you very much for
your attention!

Thank you very much for your attention!

Contact

Dr. Julian Müller

R&D New Technologies

Energy Technologies

LEONHARD KURZ Stiftung & Co. KG

Schwabacher Straße 482

90763 Fürth / Germany

Telefon: +49 911 71 411035

julian.mueller@kurz.de

www.kurz.de

