



Coatema Coating Center

The company owned coating center is one of the world's best equipped with more than 1.200 m² of floor space. It offers 10 pilot plants and 1 production plant with working widths from 250 mm to 2.000 mm.

Almost all substrates like textiles, film, paper and foil can be processed on the Center's plants. For the **production of batteries**, various materials can be used like e.g.:

- ✓ Nickel foam
- ✓ Thin copper
- ✓ Aluminium films
- ✓ Expanded metal
- ✓ Different type of separator substrates

The experts in our lab will support you during coating trials and from your idea to the finished product.

In addition to our standard plants tailor-made machines and entire automation solutions are offered by Coatema.



Coatema Coating Machinery GmbH



Coatema R&D Center on 1.200 m²



Easycoater
Working width: DIN A 4



Basecoater
Working width: 250 mm



Support by coating experts in the Coatema Coating Center



Deskcoater
Working width: 500 mm



Inert drying system - Floation Dryer
Working width: 500 mm



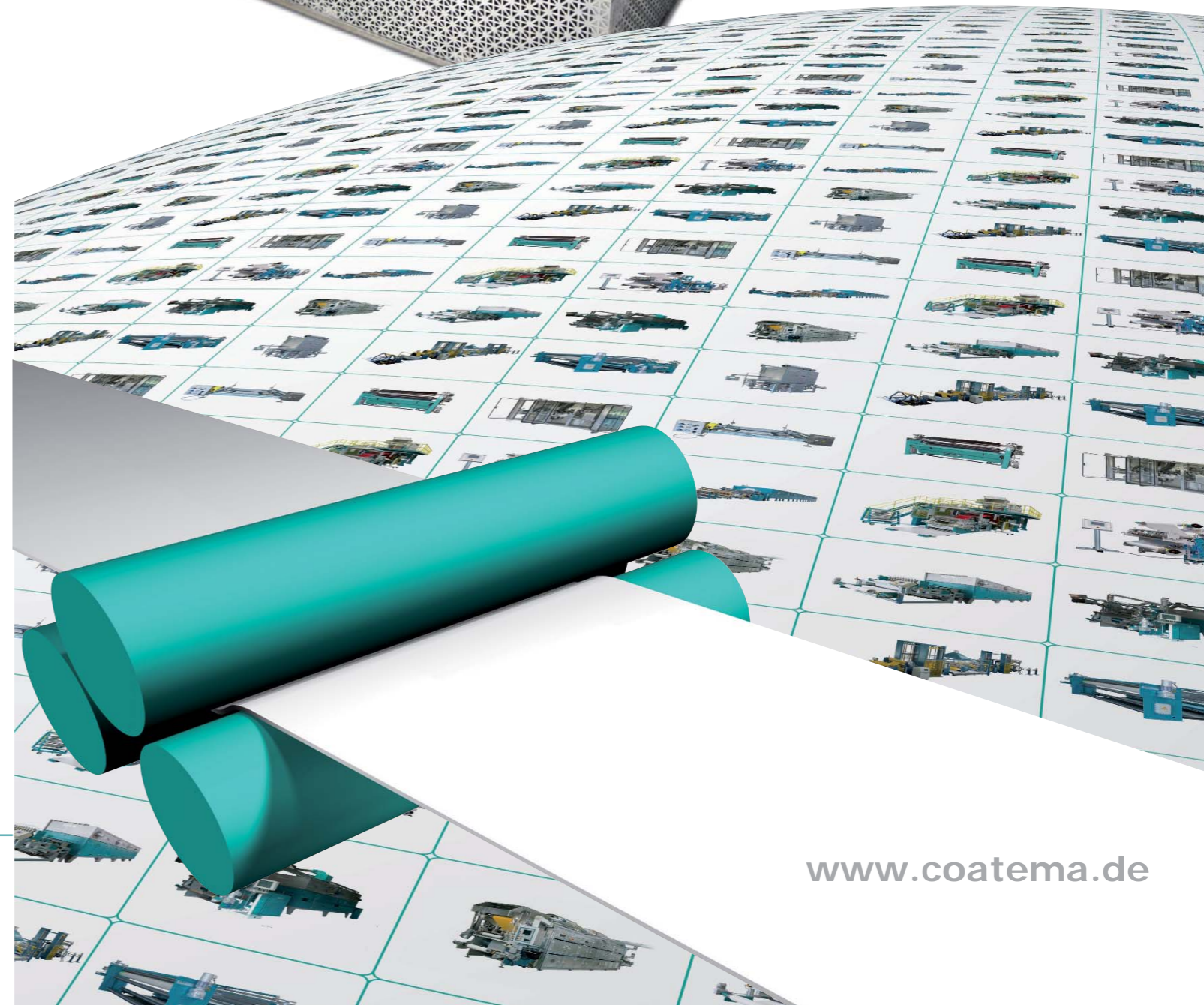
Use of the most chemicals and formulation methods

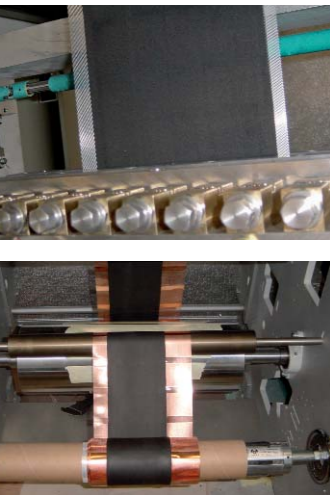


Linecoater
Working width: 500 mm



Click&Coat™ - Unit
Working width: 500 mm





Application of batteries

In-depth knowledge of the industry

For 30 years now, Coatema Coating Machinery GmbH has been designing and constructing coating and laminating plants for the most different applications. Almost all substrates and chemicals can be processed on Coatema plants; either as sheets or from roll to roll.

You may be sure that Coatema will also offer you the **optimal coating, printing, laminating and calendaring technologies** combined with different drying options under nitrogen atmosphere if needed.

Advanced battery technologies like **lithium-ion, lithium polymer and nickel metal hydride** require particularly efficient coating and casting processes for the anode, cathode and separator elements.

Battery developers and battery manufacturers can choose **single sided or double side coating**

processes, that are applied either **horizontally or vertically**.

The Coatema machines can handle **nickel foam, thin copper or aluminium films, expanded metal** or different type of separator substrates.

A wide variety of coating and printing can be used: Knife coater, Comma bar coater or reverse comma bar coater, slot die, engraved roller system, screen printing (thin film batteries). Intermittent coatings are standard for Coatema applications.

Calendering up to 60 tons on small or bigger working width are in the product delivery portfolio of Coatema.



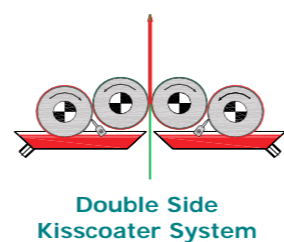
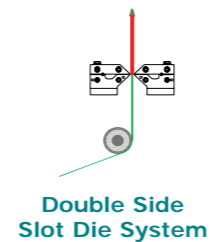
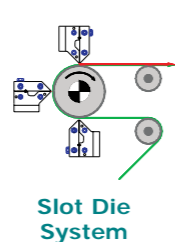
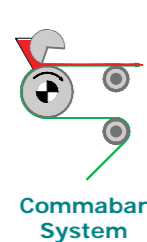
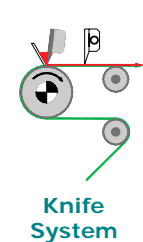
Coating plant for batteries on two levels



Vertical coating plant for batteries



Typical modular application systems for batteries



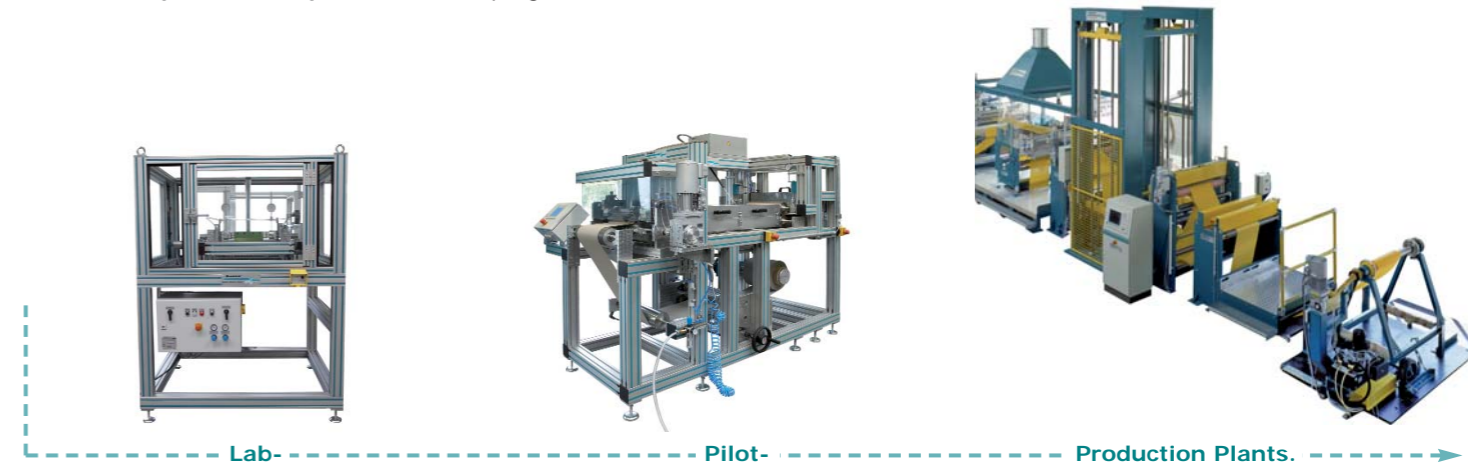
The right plant in the scale-up process

Coatema offers coating and printing expertise, from the laboratory coater to the production plant for different components of the batteries of today. The **Easycoater** can be used for developing letter size samples of anode and cathode or for casting processes.

On the **Basecoater** as shown it is already possible to run **smaller production operation** or sampling of

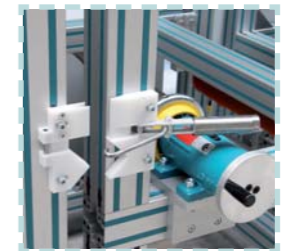
materials for customers. Based on these experiences the next step are high speed and very efficient **production scale solutions with working widths up to 1.200 mm** and flotation dryers in nitrogen atmosphere.

So from small scale to production scale of operation Coatema is the partner for battery coating operations.

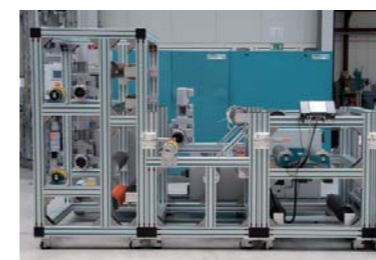


Click&Coat™ - Concept

Coatema has developed the innovative Click&Coat™ concept for pilot plants to be able to react faster and in a more cost-saving way to the most different requirements. Click&Coat™ permits the flexibility of the individual coating heads but also of the entire plant: The individual plant components are movable and can be brought into the right position by a simple "click" and be connected to the recently developed control system. This is a unique way to combine different processes in modular design.



Click&Coat™: the individual plant components can be brought into the right position by a simple "click"



Double rewriter and edge guiding system



Slot Die System



Hot Air Dryer



Calender