

Solar



Coating solutions for 3rd Generation Photovoltaics market brochure

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www.coatema.com



Lab2fab scaling a process

Leveraging cutting-edge coating & printing equipment

In the world of 3rd Generation Photovoltaics, our pioneering solutions for S2S or R2R coating and printing are revolutionizing renewable energy production. These 3rd Generation PV systems are lightweight and flexible, offer unparalleled design freedom, making them perfect for applications in greenhouses, indoor environments, and even wearable technology.

At Coatema, we are not just another coating company, we are a collective of seasoned experts with over two decades of experience in the OPV and perovskite markets. We have cultivated strong alliances with premier research institutions worldwide, establishing ourselves as a reliable and proficient partner across the whole production process of 3rd Generation cells and modules – from initial R&D and pilot equipment to mass production.

Our core expertise lies in the distinct layers of the coating and printing processes, including curing and crosslinking, annealing, and encapsulation processes. From screen printing, engraved roller printing, and inkjet printing processes to slot die coating, we provide state-of-the-art application systems.

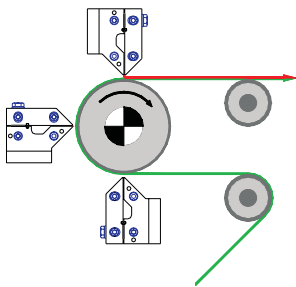
Application systems, complemented by sophisticated layer registration technology and a wide array of precise, efficient drying and annealing methods, equip you with the tools necessary for high-quality production processes and enhanced yield. Trust Coatema to bring innovation and quality to your production line.



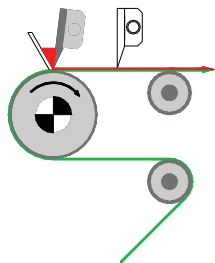
Rewinder



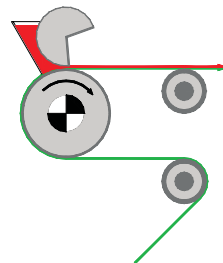
Coating & printing systems



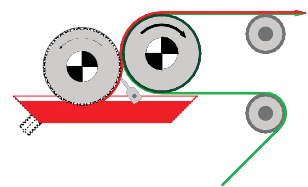
Slot die system



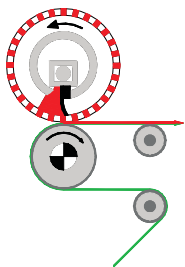
Doctor blade system



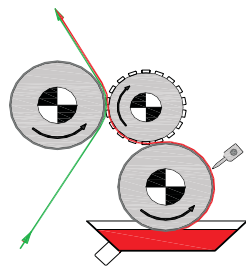
Commabar system



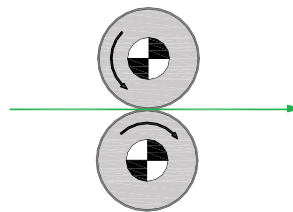
Engraved roller system



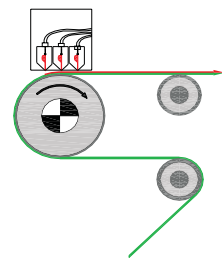
Rotary screen system



Flexoprinting system



Hot embossing system

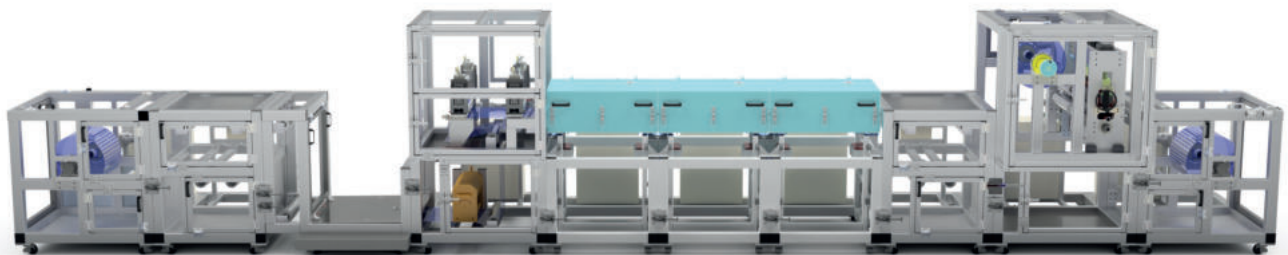


Inkjet system

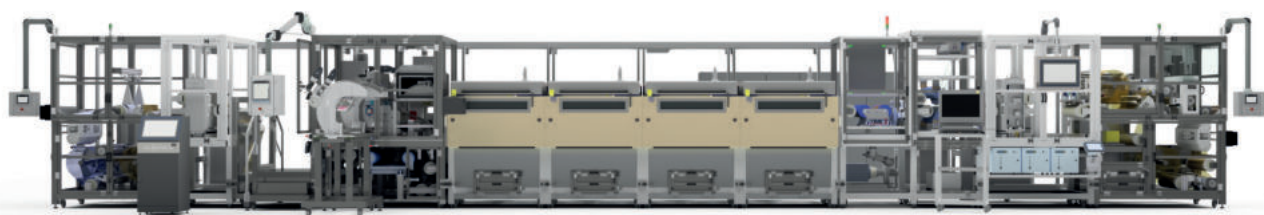
Coatema lab, pilot, and production solutions



Easycoater Evolution



Extended configuration of a Click&Coat™ coating line



Click&Coat™ pilot line



Coating and printing solutions

Overview

Coatema is a leading provider of coating systems for 3rd Generation Photovoltaic technologies, offering solutions for fundamental research, development centers, pilot plants, and industrial manufacturing. Our laboratory coater equipment, such as the Test Solution, Easycoater and Smartcoater, are designed for use in research environments, and can be customized with modified drying and annealing concepts to suit your individual applications. Integrated quality control systems including thickness measurement, inline optical inspection, and other are available.

Our pilot plants like the Click&Coat™ system or the Bascoater feature several distinguished processes like slot die coating, screen printing, inline laser scribing, and many more. Our industrial production lines are designed for production of OPV's and Perovskite and utilize integrated encapsulation of the solar cells into modules. All equipment has integrated quality control systems and industry 4.0 solutions. From lab2fab we offer the right fit of equipment solutions for R&D and manufacturing industries.

We offer a wide variety of solutions for 3rd Generation Photovoltaic technologies. In addition to our production and development equipment manufacturing, we also utilize a range of our own coating, printing, laminating units at the Coatema R&D centre for process and product development. This approach allows us to work closely with our clients to develop customized solutions that meet their specific needs. Our latest production line concept is demonstrated as a full inline process with four printing stations and four laser stations with integrated backend in the Horizon Europe Flex2Energy project.

Substrate
FTO
Compact TiO₂
Scaffold/perovskite (optional)
Perovskite (optional)
HTM
Au or Ag

Perovskite cell layout

Encapsulation (Glass or barrier film)
Anode 50 nm – 10µm Solution-processed metals (such as Silver)
Hole transport layer 30 – 100 nm
Photoactive layer 80 – 300 nm
Cathode
Transparent electrode 50 nm – 1µm Solution-processed ZnOx
Substrate Transparent ITO or metal oxides plastic film (i.e. PET, PEN)

OPV cell layout

Coatema R&D solutions

At Coatema Coating Machinery GmbH in Dormagen, Germany you have the opportunity to work in the world's largest and most versatile R&D centre for coating, printing, and laminating.

- ✓ Equipped with S2S and R2R coaters, pilot lines for coating & printing, versatile and modular Click&Coat™ systems
- ✓ Over 10 pilot lines with working widths from 100 mm up to 500 mm in operation – also available for virtual trial runs
- ✓ Experienced technical and executive staff, well equipped chemical labs & meeting rooms
- ✓ Needs based analysis and measured, actionable results before, during, and after process trials
- ✓ From idea to process to product, the Coatema R&D centre with the R&D projects team is the place to be for everyone in solar, fuel cells, electrolyzers, batteries, membranes, printed electronics and more

If you like to run trials please contact:
sales@coatema.de or call: +49 21 33 97 84 - 0



**Visit our
R&D website**



**Visit our virtual
R&D centre**



Research & development centre at Coatema