



Technology Center Center for future-oriented coating technology.

Product development and optimisation The best ideas are created together.

Through the Technology Center at its Hamburg location, KROENERT offers an unique service. On totally two different coating lines with a variety of possible technical processes line layouts tailored to customer needs as well as the appropriate process technology are developed. Equally, new processes are tested or existing processes are optimised. The equipment at the Technology Center makes it one of the biggest test centres in the industry.

Development of individual machine layouts.

At the Technology Center the customer has the opportunity to test coating, drying and curing processes for different end products, and with various materials. Line layout, process technology and parameters are developed and optimised for the customer's end product, before they invest into a new line. This optimisation can be carried out in close cooperation with the raw material or substrate suppliers during the test runs at the Technology Center. Studies on increasing efficiency, improving cost-effectiveness and reducing the use of materials can also be performed.

Raw material development.

Producers of coating materials and application media can also benefit from the Technology Center. The ever-improving performance of machines leads to a constant demand for new material compositions, which can generally be tested in our laboratory facilities. However, a 1:1 conversion to larger production lines is rarely possible – for this our Technology Center is available to the customer.

Production lines:

- **RECO A**
Multifunctional line with over 60 application processes
- **LABCO**
Multifunctional machine for smaller batches

Cooperations:

- Because of continuous cooperation with institutes and universities, the Technology Center is always at the cutting edge of technology.
- In terms of this particular scope of work, for instance, experience from everyday practice is entered into theoretical computer models.
- The Technology Center is also available for training and workshops.



RECO A
The high-performance production line for water and solvent-based media as well as 100% systems.

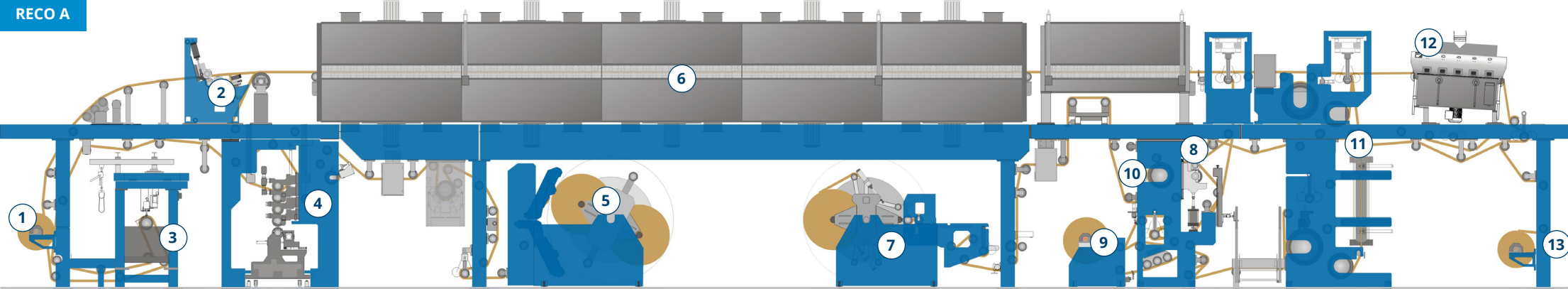
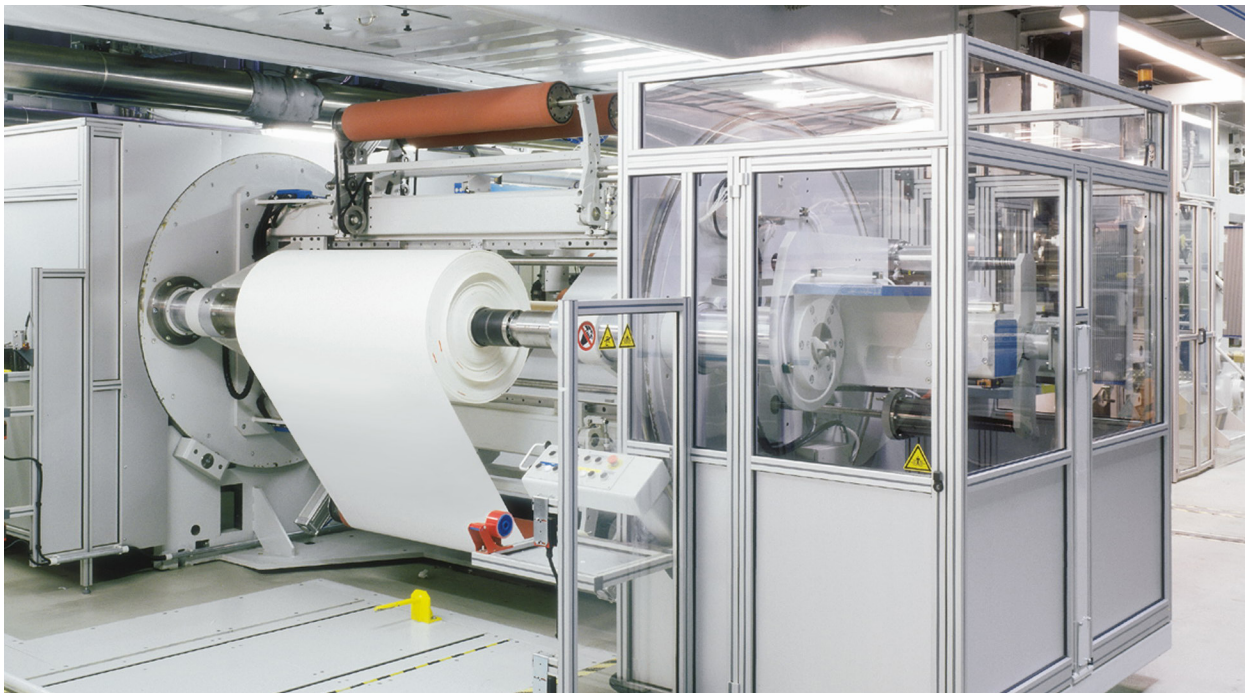
The multi-functional RECO A is at the heart of the Technology Center. It is used primarily for the production of semi-finished items for flexible packaging, technical products as well as products for use in the renewable energy fields.

Flexible materials such as paper, cardboard, polymer films, textiles and metal foils in roll format are coated and laminated. Water and solvent-based dispersions, emulsions and suspensions, as well as 100% systems, can be used for coating. Both wet and dry laminating are available.

The RECO A disposes of over 60 coating technologies.

Equipment:

| | |
|-------------------------------|--|
| Dosing and Materials Handling | Eccentric screw pumps Gear pumps Micro gear pumps |
| Measuring Technology | Rotational viscometer Surface tension meter Flexible weight measurement (ultrasonic) 3D microscope for visual coating assessment Drying oven Scales |
| Mixing Units | Agitators Further aggregates after by arrangement |



1. Auxiliary unwinder (wet laminating, unwinder 2)
2. Spreading table and slot die in bead mode
3. Slot die coating station
4. Coating station with trolley
5. Turret unwinder (unwinder 1)
6. Drying channel
7. Turret re-winder
8. Laminating station
9. Auxiliary unwinder (dry laminating) (unwinder 3)
10. Spray moisturizer
11. Steam moisturizer
12. UV unit
13. Auxiliary re-unwinder (de-laminating, unwinder 4)

RECO A

Technical Data:

| | |
|------------------------------------|---|
| Working width | 1.300 mm |
| Material widths min, max. | 500 - 1.300 mm |
| Roll external diameter, max. | Unwinder and re-winder 1300 mm Unwinder 2 and 3 800 mm Auxiliary unwinder and re-winder 1000 mm |
| Internal diameter of winding cores | Unwinder 1 76 mm (3") u. 152 mm (6") Unwinder 2 76 mm (3") u. 152 mm (6") Unwinder 3 76 mm (3") u. 152 mm (6") Unwinder/winder 4 76 mm (3") u. 152 mm (6") Re-winder 152 mm (6") External diameter min. 175 mm |
| Web tensions | Unwinder 1, 2, 3, 4 50 - 300 N Re-winder 150 - 700 N Machine speeds 4 - 1.610 m/min |
| Coating weights, dry | Coating < 0,2 g/m² - 200 g/m² Processing temperatures in the coating head of up to 90 °C |
| Coating systems | Gravure rollers, Smooth and multiple rollers, Roll doctor blades, Comma bars Slot die Clean room conditions at enclosed coating table/slot die coating station Curtain coating Slot die 1 slot up to 1.200 mm Slide die 3 slots up to 800 mm |
| Dryer | Length 6 sections at 3 m in length Temperature max. 200 °C Recirculation volume/section max. 27.000 m³/h Air outlet speed at nozzle max. 50 m/sec. Total amount of exhaust air max. 25.000 m³/h Dryer performance (thermal oil) max. 1.200 kW IR 6 x 6,2 kW/bar |
| UV-Station | N2 inerted UV lamps 3 Performance of each UV lamp 25 - 200 W/cm adjustable |
| Laminating stations | 2 or 3 rollers dry or wet |
| Remoistening stations | Steamtec 1.0 600 kg/h Steam moisturizer Weko water spray system |
| Materials | Paper 17 - 180 g/m² Cardboard 180 - 500 g/m² Polymer film 3 - 500 µm Metal foil 6 - 150 µm Length of substrates, min. 2.000 m |
| Necessary coating media quantity | solvent less min. 30 - 50 kg solvent based min. 120 l Silicone min. 10 kg Dispersions min. 100 - 200 l |

Additional equipment such as Corona pretreatment, web cleaner, antistatic devices etc. are components of the line.

LABCO

The pilot coating line for small batches.

The LABCO can be used with water and solvent-based media, as well as 100% systems, for the production of functional layers, in clean room like conditions, for use in organic photovoltaics, printed electronics, Li-ion batteries or in fuel cells. The line can also coat materials for the production of membranes, adhesive tapes or labels and release products.

Wet and dry laminating are available. The results are scalable on a 1:1 basis to KROENERT production lines.

Technical Data:

| | |
|--------------------------|---|
| Web width | 500 mm |
| Material widths | 100 - 500 mm |
| Roll external diameters | up to 400 mm |
| Machine speeds | 0,1 - 40 m/min |
| Internal diameters/cores | 3", alternative 6" with adapter |
| Coating weights, dry | <0,1 - 200 g/m ² |
| Coating systems | Gravure rollers, Smooth & multi rollers, Doctor blade, Slot die coating, Kiss Coat |
| Viscosity ranges | 50 - 20.000 mPas (20 °C, 100 [1/sec]) |
| Coating rollers | 200 mm, mounted on both sides |
| Dryer | 3 x 2 m sections, electronic heating |
| Temperature, max. | 160 °C |
| Web guiding | Floating or roller supported |
| Air circulation | max. 28 m/sec, frequency regulated, up to 2.700 m ³ /h per section |
| IR and UV curing | by arrangement |
| Guide rollers | 80 mm, cantilever mounted |
| Substrates | Paper 20 - 200 g/m ² Aluminum foil, copper foil 8 - 30 µm PE, PP, PET, PA films etc. 15 - 100 µm Fabrics and non-wovens 10 - 100 g/m ² |



Our expertise. Your productivity gain.

Together with you, we want to gain insights, push boundaries, make decisions – with our Technology Center, we support the development and optimisation of production processes and make possible what neither capacity nor flexibility are available for in everyday production.

Our experts are always available for individual product optimisations or questions.



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