technologies for functional printing

explorer 800

The explorer 800 is a roll-to-roll inkjet printing system with integrated drying and curing units, ideal for developing and producing functional layers and structures on flexible substrates.

800

explorer

Modular Roll-to-Roll Inkjet Printing System with Integrated Drying and Curing

The explorer 800 offers industrial inkjet printing with precise web handling and recipe-based automation for R&D and scalable pilot production of functional layers and structures.

Applications

- Pilot and small batch production on flexible substrates
- Development of printed energy and sensor components
- Inkjet printing of functional materials
- Ink and substrate testing under production conditions

Printing & Ink System

Industrial inkjet printing
Up to 4 heads
Closed ink supply

Drying & Curing

Two zone hot air
NIR
UV
Photonic

Web Handling & Automation

Precision tension control
Vacuum pull table
Splice station
Recipe-based processing

Technical Data

Printing technology:	Inkjet (up to 4 heads); printhead selection based on customer application and verified in feasibility test with nsm
Drying/Curing methods:	Two-zone hot air, NIR, UV, Photonic Curing
Substrate pre-treatment:	Corona treatment, Web cleaning, De-ionizing web solution
Web handling & control system:	Electronic web tension control with force measuring system, Web edge guide and register control, Vacuum pull table for controlled substrate feed, Integrated splice table for substrate changes
Substrate size:	Up to 635 mm web width
Substrate compatibility:	Flexible substrates (e.g. PET, Polyimide, Paper, Metal foils)
Process speed:	Application-dependent; defined with customer. Supports stop-and-go and continuous operation.
Production mode:	User-specific recipe management for precise process control
Data exchange:	OPC UA, SQL database
Dimension (L x W x H):	3450 × 2150 × 2070 mm
Weight:	Approx. 2700 kg

Technologies & Options

- **Customizable Industrial Inkjet Integration:** The explorer 800 supports integration of industrial inkjet heads from various manufacturers. Depending on resolution, drop volume, ink type, and speed requirements, the most suitable printhead and configuration is selected and integrated.

- **Closed Ink Supply and Purging System:** A closed-loop ink supply includes degassing, filtration, magnetic stirring, and recirculation. Ink pressure is regulated. Integrated purging and wiping stations ensure consistent nozzle performance and minimal downtime. Ink is supplied via monitored ink bottles.

- **Precision Substrate Positioning & Print Registration:** Accurate substrate positioning is achieved through synchronized motion control and optional optical registration systems. These systems enable alignment with fiducial marks or printed reference structures, ensuring consistent print-to-substrate registration.

- **Intelligent Web Transport System:** Features a high-precision roll-to-roll web-handling system with load-cell-based tension control, servo-driven unwinder/rewinder, edge guiding, and a vacuum-supported pull table with microporous vacuum plate and servo drives for stop-and-go printing. An integrated splice table allows fast and ergonomic substrate changes during setup or roll exchange.

- **Modular Drying and Curing Technologies:** Equipped with configurable Hot Air (two-zone), NIR, UV, or Photonic Curing modules tailored to the specific requirements of conductive and functional inks. These systems ensure complete drying and proper film formation to maintain electrical performance and layer integrity before final winding.

- **Process Automation and Data Handling:** The intuitive control interface enables full process automation with recipe-based configuration, live monitoring, alarm history, and data export. Software interfaces support structured process control and repeatable print jobs.

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