

# Precision Transfer Coating Machine For Lithium Ion Battery Electrodes

Item Number: TB24



## Introduction

Precision transfer coating machine for lithium ion battery electrodes delivers controlled continuous or intermittent slurry coating, drying, and rewinding for aluminium and copper foil substrates in research, pilot production, and advanced materials development with repeatable process control and production-ready handling.

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| Application                                          | Description                                                                                                                               | Key Benefit                                                                                                                 |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Lithium-ion cathode electrode preparation            | Coats lithium iron phosphate or ternary-material slurry onto aluminium foil for positive-electrode sheet preparation.                     | Supports the specified positive-electrode thickness, coating-weight, slurry-solids, density, and viscosity process windows. |
| Lithium-ion anode electrode preparation              | Coats graphite slurry onto copper foil for negative-electrode sheet preparation.                                                          | Supports water-based negative-electrode slurry conditions and a maximum negative-electrode coating speed of 5 m/min.        |
| Battery materials R&D                                | Produces coated and dried electrode rolls for evaluating slurry formulation, coating thickness, and coating weight within defined ranges. | Enables work with both positive and negative electrode material systems on one process platform.                            |
| Pilot electrode manufacturing                        | Provides a connected unwinding-to-rewinding process for pilot-scale preparation of coated electrode rolls.                                | Integrates coating, drying, traction, and collection steps for orderly preparation before downstream operations.            |
| Intermittent electrode patterning                    | Produces electrodes with coated segments separated by controlled uncoated areas.                                                          | Provides a minimum gap length of 5 mm and a minimum coating length of 30 mm.                                                |
| Continuous electrode coating                         | Applies uninterrupted slurry layers for electrode formats requiring a continuous coated area.                                             | Supports continuous coating over a maximum 300 mm coating width.                                                            |
| Process-window verification                          | Evaluates coating behavior against defined foil, slurry, dry-thickness, coating-weight, and operating-speed conditions.                   | Keeps critical input and output parameters visible for process setup and acceptance planning.                               |
| Electrode-roll preparation for subsequent processing | Dries coated foil and rewinds it after the coating process to prepare material for following cell-fabrication stages.                     | Uses a 9 m, single-layer electric-heating oven with a maximum temperature of 140°C.                                         |

| Item                      | TB24 Specification                                                                                                                                                                     |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment function        | Precision coating of lithium-ion battery positive and negative electrode sheets; prepared slurry is uniformly coated onto the substrate, dried, and rewound for downstream processing. |
| Main system sections      | Unwinding section, coating-head section, oven section, traction section, rewinding section, and electrical-control section.                                                            |
| Process sequence          | Unwinding, slurry coating, drying, traction, rewinding.                                                                                                                                |
| Roller-face width         | 400mm                                                                                                                                                                                  |
| Mechanical speed, no load | Max:6m/min                                                                                                                                                                             |
| Oven heating method       | Electric heating                                                                                                                                                                       |
| Oven structure            | 3 sections × 3m/section = 9m, single layer                                                                                                                                             |

| Item                     | TB24 Specification |
|--------------------------|--------------------|
| Maximum oven temperature | Max□ 140°C         |

| Substrate Parameter | Positive Electrode | Negative Electrode |
|---------------------|--------------------|--------------------|
| Substrate           | Aluminium foil     | Copper foil        |
| Width (mm)          | 100□ 320           | 100□ 320           |
| Thickness (μm)      | 9□ 25              | 6□ 20              |

| Slurry Parameter                             | Positive Electrode                              | Negative Electrode |
|----------------------------------------------|-------------------------------------------------|--------------------|
| Material                                     | Lithium iron phosphate, ternary materials, etc. | Graphite           |
| Solvent                                      | NMP                                             | DI-Water           |
| Solid content (wt%)                          | 40□ 85                                          | 35□ 65             |
| Slurry specific gravity (g/cm <sup>3</sup> ) | 1.5□ 3.0                                        | 1.0□ 2.0           |
| Viscosity (mPa.s)                            | 5000-15000                                      | 3000-8000          |

| Coating Parameter                      | Positive Electrode                       | Negative Electrode                       |
|----------------------------------------|------------------------------------------|------------------------------------------|
| Coating method                         | Continuous coating, intermittent coating | Continuous coating, intermittent coating |
| Coating width (mm)                     | Max:300                                  | Max:300                                  |
| Single-side coating dry thickness (μm) | 50□ 250                                  | 50□ 250                                  |
| Single-side coating weight (g/□ )      | 100□ 250                                 | 80□ 200                                  |
| Coating speed (m/min)                  | 1□ 4                                     | 1□ 5                                     |

| Roll Handling Parameter  | Unwinding                                                    | Rewinding                                                    |
|--------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| Maximum roll diameter    | Max.φ300mm                                                   | Max.φ300mm                                                   |
| Maximum load capacity    | Max.100kg                                                    | Max.100kg                                                    |
| Core specification       | Inner diameter 3 inches, approximately 76.2mm; length ≤400mm | Inner diameter 3 inches, approximately 76.2mm; length ≤400mm |
| Supported core materials | Metal, ABS plastic, paper core                               | Metal, ABS plastic, paper core                               |

| Process Requirement                         | Requirement                                                                                                                                                                                                                  |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Coating-speed consideration                 | Coating speed is related to product characteristics, including material system, coating thickness, solid content, and temperature. The maximum coating speed stated above may not meet special coating-process requirements. |
| Minimum intermittent gap length             | 5mm                                                                                                                                                                                                                          |
| Minimum coating length                      | 30mm                                                                                                                                                                                                                         |
| Same-batch slurry solid-content fluctuation | ≤±0.5%                                                                                                                                                                                                                       |
| Same-batch slurry viscosity fluctuation     | ≤±500mPa.s, 25±2°C                                                                                                                                                                                                           |
| Foil condition for acceptance               | Aluminium foil or copper foil should not show looseness, uneven thickness or weight, surface oil contamination, or other conditions affecting web transport and coating performance.                                         |