Roll to Roll Equipment Application
Applications for Web Coating Technology

- **Transparent Barrier** for Packaging, etc.
- **Metallic barrier** for Food Packaging, etc.
- **AR film** for Smart phone, etc.
- **Flexible Display** for Smart phone, etc.
- **Metal Wiring** for Flexible Device
- **Conductive film** for Touch panel
- **Anode, Collector Pre-doped anode for LIB, LIC**
- **Film Capacitor** for Hybrid Vehicle
- **Polarizer, Wire Grid**
- **Decoration Metallic Yarn**
- **EMI Shield** for Packaging, etc.
- **Stamp Foil, Labels**
- **Magnetic tape Storage**
- **Conventional Film Capacitor** for Wind/Solar Power
- **Actuator, Flexible Sensor**
- **Window film** for Automotive, etc.
- **Sputtering Roll Coater**
  - **SPW Series**
- **Evaporation Roll**
  - **EB Heating type EWJ Series**
- **Coater**
  - **IH Heating type EWA Series**
  - **RH Heating type EWE Series**
  - **Special RH Heating type EWK Series**

* all figures based by ULVAC calculation
Vacuum roll to roll system

ULVAC offers a wide range of roll coater systems with a proven track record.

**Sputtering Roll Coater**

**SPW Series**

(SPW-030/ SPW-060/ SPW-165Cn)

- Web Width: Up to 1600mm
- Cathode type: Planer / Rotary (Magnetron Cathode)
- Sputter Power Supply: DC/ Pulse DC/ MF
- **Features**
  - Thin web handling with high speed deposition (OPP 2.0μm - Depo speed 600m/min)
  - High speed patterning for self-security function
    - Pattern accuracy < 0.2 ± 0.05mm
    - Depo speed 750m/min

**EWE Series** (for Film Capacitor)

(EWE-060/ EWE-080/ EWE-110)

- Web Width: Up to 1050mm
- Evaporation Source: Resistance Heating type
- **Features**
  - Thin web handling with high speed deposition
  - High speed patterning for self-security function

**IH Evaporation Roll Coater**

**EWA Series**

(EWA-110/ EWA-165/ EWA-210 / EWA-250/ EWA-330)

- Web Width: Up to 3300mm
- Evaporation Source: Induction Heating type
- **Features**
  - Low pin-hole deposition with IH Heating
  - Transparent barrier film (AlOx, SiOx) deposition

**RB Evaporation Roll Coater**

**EWJ Series**

(EWJ-020/ EWJ-060/ EWJ-110/ EWJ-165/ EWJ-210)

- Web Width: Up to 2100mm
- Evaporation Source: EB Heating type
- **Features**
  - High Rate deposition: Cu 12μm·m/min
  - High-melting-point metal, Sublimation material Cu, Al, Ni, Ti, AlOx, SiOx, MgO, etc...

**Evaporation Roll Coater**

**EWK Series** (for LiB/LiC)

(EWK-030 / EWK-060)

- Web Width: Up to 600mm
- Evaporation Source: Resistance Heating type
- **Features**
  - High rate Li deposition: 20μm·m/min
  - Li surface protection with passivation treatment

**Roll to Roll Degassing system**

**TWH Series**

(TWH-060/ TWH-110/ TWH-165/ TWH-210)

- Heating Source: IR Plate Heater, Ramp Heater, Hot Roller
- Web Width: Up to 2100mm
- **Features**
  - Clean and effective degassing under vacuum condition and web transfer condition
  - Selectable various heating method for purpose
## Selection Guide ~ Vacuum roll to roll system

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<th>System</th>
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<td>Flexible Sensor</td>
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<td>EMI Shield</td>
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<tr>
<td>Polarizer, Wire Grid</td>
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<tr>
<td>Battery</td>
<td>Au, Al, Zn, ZnS, In, Sn, ZrOx, H.M.M. Ox,Ny</td>
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<td>Window Film</td>
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<tr>
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*H.M.M.: High Melting-point Metal*
Sputtering Roll coater / SPW-Series

SPW series is sputtering roll coater for electronics device
It is ideal for multi layer deposition
It has process extension by additional chambers and various options

SPW-030 (ESW-030)
- Simple and compact model for R&D use
- High maintainancavility with double side maintenance hatch
- Selectable one evaporation source option (model: ESW-030)

SPW-060
- Medium size and high performance model for electric device.
- Low gas contamination with differential pumping: Between Cathode to Cathode < 1%
- Selectable two types of platform: Batch type, Load-lock type
- Batch Type: Stable film transfer by single roller base
  : Optimal film pass line for various pre-process
- Load lock Type: High productivity with load-lock chamber
  : High maintenance performance with double side dolly system

SPW-165Cn
- High throughhput model for touch panel, optical film, window film and so on
- Low gas contamination with differential pumping: Between Cathode to Cathode < 1%
- Process extensibility with module chamber concept and various option

< Application >
- ITO Film
- Metal Mesh
- Metal On ITO Touch Sensor
- AR Film
- FCCL
- Electrode material
- Window Film
- Wire Grid
- Flexible Parts and so on.

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<th>SPW-030</th>
<th>SPW-060</th>
<th>SPW-165Cn</th>
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<tbody>
<tr>
<td>Web Width</td>
<td>Max 300mm</td>
<td>Max 600mm</td>
<td>Max 1600mm</td>
</tr>
<tr>
<td>Web Material</td>
<td>PET, PEN, PI, PC, COP, TAK and others</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web Thickness</td>
<td>PET: 25~200 μm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Web Diameter</td>
<td>Φ300mm</td>
<td>Φ550mm</td>
<td>Φ900mm</td>
</tr>
<tr>
<td>Winding Speed</td>
<td>0.5~5.0m/min</td>
<td>0.5~10m/min</td>
<td>0.5~10m/min</td>
</tr>
<tr>
<td>Cathode type</td>
<td>Planer</td>
<td>Planer/Rotary</td>
<td>Planer/Rotary</td>
</tr>
<tr>
<td>Cathode</td>
<td>DC Single: 4 sets AC Dual: 2 sets</td>
<td>DC Dual: 4 sets AC Dual: 4 sets</td>
<td>DC Dual: 4 x n sets AC Dual: 4 x n sets</td>
</tr>
<tr>
<td>Sputtering Target Material</td>
<td>ITO, Nb2O5, SiO2, Cu and Metal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Roller Temperature</td>
<td>-20<del>80°C Option: -10</del>180°C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-process (Option)</td>
<td>BMB (DC, RF), Ion Gun, Heater</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td>9mW x 9.8mL x 2.6mH</td>
<td>(Load lock type) 15mW x 10mL x 3.9mH</td>
<td>(C1 Type) 19mW x 17mL x 4.3mH</td>
</tr>
</tbody>
</table>

*This specification may be changed without notice.
**IH Evaporation Roll coater / EWA-Series**

**EWA series** is IH heating type evaporation roll coater for industrial films. It is ideal for high speed deposition and wide web handling.

**Features**
- Low pin-hole deposition with IH Heating
- Wide web handling: Up to 3300mm
- 6 motor system for high stability web winding under high speed deposition
- Oxide deposition for transparent barrier film (AlOx, SiOx)
- It can deposit various materials for multi purpose (Al, Cu, Ag, Cr, Sn, In, ZnS, SiOx, AlOx)
- Adopt to low O.D. value

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**Application**
- Food package
- Transparent barrier film
- Transfer film
- Stamping
- Security
- Reflection Sheets
- Hologram
- Ultrathin Al film for microwave oven
- EMI Shield
- Electrode material and so on.

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<tr>
<th>EWA-165</th>
<th>EWA-210</th>
<th>EWA-250</th>
</tr>
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<tbody>
<tr>
<td><strong>Web Width</strong></td>
<td>Max.1650mm</td>
<td>Max.2150mm</td>
</tr>
<tr>
<td><strong>Web Material</strong></td>
<td>PET : 9 - 50 μm</td>
<td>CPP : 20 - 30 μm</td>
</tr>
<tr>
<td><strong>Web Diameter</strong></td>
<td>Φ1150mm</td>
<td></td>
</tr>
<tr>
<td><strong>Winding Speed range</strong></td>
<td>100~600 m/min</td>
<td>100~800 m/min</td>
</tr>
<tr>
<td><strong>Evaporation Material</strong></td>
<td>Al, Cu, Ag, Cr, Sn, In, ZnS, SiOx, (AlOx)</td>
<td></td>
</tr>
<tr>
<td><strong>Crucible Qty.</strong></td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td><strong>O.D.(Al)</strong></td>
<td>0.3 ~ 3.0</td>
<td></td>
</tr>
<tr>
<td><strong>Driving Motor</strong></td>
<td>6 motor system</td>
<td></td>
</tr>
<tr>
<td><strong>Deposition Winding Speed</strong></td>
<td>450m/min (Al O.D. 2.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Deposition Length</strong></td>
<td>36,000m (Al O.D.2.2)</td>
<td></td>
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<tr>
<td><strong>Main Roller Temp.</strong></td>
<td>-20 ~ 30 ℃</td>
<td></td>
</tr>
<tr>
<td><strong>Thickness Monitor</strong></td>
<td>Transmittance Monitor (ULVAC FADAM) Option : EDDY current monitor</td>
<td></td>
</tr>
<tr>
<td><strong>Thickness Monitor Prove Qty.</strong></td>
<td>11pts</td>
<td>14pts</td>
</tr>
<tr>
<td><strong>Layout</strong></td>
<td>9.2mW x 16mL &lt;br&gt; 4.2mH + 2.6mD(Pit)</td>
<td>9.5mW x 17mL &lt;br&gt; 4.5mH + 4.5mD(Pit)</td>
</tr>
</tbody>
</table>

*This specification may be changed without notice.*
**RH Evaporation Roll coater / EWE-Series**

*Special use for film capacitor*

**EWE series can high speed and high accuracy pattern deposition for High End type Film capacitor.**

- **Thin web handling with high speed deposition.**
  - OPP 2.0μm - Depo speed 600m/min

- **High speed patterning for self-security function.**
  - Pattern accuracy < 0.2 ± 0.05mm Depo speed 750m/min

- **High definition and high speed patterning technique by flexographic unit.**
- **Measurement of thin pattern width by optical camera.**

<table>
<thead>
<tr>
<th>Feature</th>
<th>EWE-060</th>
<th>EWE-080</th>
<th>EWE-110</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Width</td>
<td>Max.670mm</td>
<td>Max.820mm</td>
<td>Max.1050mm</td>
</tr>
<tr>
<td>Web Material</td>
<td>OPP 2.0 – 6.0μm</td>
<td>OPP 2.0 – 6.0μm</td>
<td>OPP 2.0 – 6.0μm</td>
</tr>
<tr>
<td>Web Diameter</td>
<td>φ650</td>
<td>φ650</td>
<td>φ620</td>
</tr>
<tr>
<td>Winding Speed</td>
<td>100–1200m/min</td>
<td>100–1200m/min</td>
<td>100–1000m/min</td>
</tr>
<tr>
<td>Driving Motor</td>
<td>8 motor system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AL Evap.Boat Qty</td>
<td>11</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Deposition Winding Speed</td>
<td>750m/min (OPP 2.3μ – Al 10Ω/□~)</td>
<td>750m/min (OPP 2.3μ – Al 10Ω/□~)</td>
<td>750m/min (OPP 2.3μ – Al 10Ω/□~)</td>
</tr>
<tr>
<td>Resistance Uniformity</td>
<td>10Ω/□ ± 15%</td>
<td>Reference examples</td>
<td></td>
</tr>
<tr>
<td>Deposition Length</td>
<td>55,000m (OPP 2.0μ ~)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern accuracy</td>
<td>&lt; 0.2 ± 0.05mm (Depo speed 750m/min, OPP 2.3μ ~)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Roller Temperature</td>
<td>-20 ~ 20 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Layout</td>
<td>8.5mW x 14mL x 4.2mH + 2.5mD(Pit)</td>
<td>8.5mW x 15mL x 4.2mH + 2.5mD(Pit)</td>
<td>8.5mW x 15.5mL x 4.2mH + 2.5mD(Pit)</td>
</tr>
</tbody>
</table>

*This specification may be changed without notice.*
EWJ series is EB evaporation RTR system for multi purpose. It is ideal for ultra high rate deposition, and high-melting-point metal and Sublimation material deposition (Cu, Ni, Ti, AlOx, SiOx, MgO, etc...)

- High Rate deposition : Cu 12μm・m/min (Max Value)
- High power EB gun : 100kW
- Thick Layer deposition with thin under/top coating with sputtering cathode (EWJ-060, -165)

**< Internal drawing EWJ-060 >**

**< Application >**
- Transparent Barrier
- Hologram
- EMI Shield
- Electrode material
- Capacitor
- Metal Mesh TSP
- Wire Grid

**Model** | **EWJ-025** | **EWJ-060** | **EWJ-165** | **EWJ-210**
---|---|---|---|---
Web Width | Max.250mm | Max.600mm | Max.1450mm | Max.2120mm
Web Material | PET 25~50μm | PET 9~50μm | PET 75~200μm | PET 9~25μm
Web Diameter | Φ500mm | Φ500mm | Φ650mm | Φ1200mm
Evaporation Material | Cu, Al, Ag, Ni, Ti, AlOx, SiOx, MgO, other high melting point metals and sublimation materials
Material Heating | 100kW EB Gun 1pc | 100kW EB Gun 2pcs | 300kW EB Gun 2pcs
Thickness Monitor | Transmittance Monitor, Option: Eddy Current Monitor
Main Pump | Depo Zone : Oil Diffusion Pump
Pre-process Option | BMB(DC,MF,RF), Ion Gun
Sputtering Option | DC Cathode | DC Cathode | -
Main Roller Temperature | -20 ~ 20 °C
Layout | 8mW x 8mL x 3mH | 9.5mW x 15mL x 4.3mH + 2.5mD(Pit) | 11.5mW x 7mL x 4mH + 3mD(Pit) | 20mW x 22mL x 4.1mH + 5.4mD(Pit)

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