POLYCOATER

 Inline Sputtering of 3-Dimensional Parts for Multiple Applications

Green Metallizing  Chrome (VI)-free  Cost Effective  Reliable Process  Sustainable Process
POLYCOATER
Inline Sputtering System for 3-Dimensional Parts for Multiple Applications

Sputtering Technology at a Glance

Whether in cosmetics or automotive – metallic quality surfaces are needed more than ever in the decorative sector. However, the coating (sputtering) of sensitive layers is usually an expensive step. A new fully automated inline sputtering system with the brand name POLYCOATER is being successfully introduced to resign products and parts for high end materials.

Looking ahead Industry 4.0 and human responsibility the inline sputtering system is considering these important subjects with unique and innovative on-board features. This makes the POLYCOATER inline system economic because the operations have no contact to hazardous and harmful materials.

SINGULUS TECHNOLOGIES (SINGULUS®) offers with the POLYCOATER the second generation of inline coating solutions for fully automated handling and coating of 3-dimensional parts. From loading to packaging, the process is fully automated at a cycle time of only 6 seconds per carrier. This manufacturing solution is interesting for automotive, consumer goods, sanitary parts, mobile phones and packaging used in the cosmetics or beverage industry.
The POLYCOATER is an inline vacuum sputtering production system for the fully automatic coating of 3-dimensional plastic parts. The sputtering module can be interlinked with different innovative handling concepts, which provide the possibility of incorporation of additional production modules (e.g. pretreatment lacquering module, robot handling systems). The POLYCOATER system is designed as a system for industrial production use. The system can be integrated into the existing production flow. An exchange handling system is loading new parts and is unloading the metallized parts to an interface position. The POLYCOATER is the result of the combination of proven coating technologies, high performance expertise and unique experience bundled with a revolutionary concept for the application of 3-dimensional coating onto parts. Not only decorative, but also functional layers could be applied. Possible approaches are antibacterial coatings, EMV-shielding, electrically conductive layer (e.g. on electroplating components before the process) or antennas.

Each electrically conductive and nonmagnetic metal and its alloys can be used as a metallic layer. This is a clear unique selling point, compared to batch processes, in which the selection of possible coating materials is much more limited. The POLYCOATER offers a reproducible layer uniformity and high deposition rates with highest coating quality and a high uptime through to permanent sputtering process control. The cycle time per carrier is down to 6 seconds with up to 18 parts on one carrier.
POLYCOATER Features

- Cycle time per carrier down to 6 seconds
- Rotation of parts during sputtering process
- Target materials e.g.: Al, Cu, Cr, Zr, CuAl, Ag, Au, Stainless Steel and TCO
- High quality coating and cost-effective technology
- Environmentally friendly metallization in comparison to traditional processes
- Equipped with two high rate cathodes designed by SINGULUS TECHNOLOGIES
- Reproducible layer uniformity and high deposition rates on complex 3-dimensional parts
- Reliable and clean sputtering process
- Highly and unique integrated design
- Minimum floor space required
- Excellent maintenance and service accessibility
- The POLYCOATER is equipped with a remote support interface. Software support will be done via internet

![Top View](image1.png)

**METALLIZATION WITH POLYCOATER**

1. **LOADING**
2. **SORTING**
3. **MOLDING**
4. **ROBOT**
5. **MANUAL**

**Metal Layer**

- Al, Au, Ag, Cu, Ti, ...  
  Alloys: NiCr, CuAl [Decogold], ...

![Customer Line Hardware Interface](image2.png)

- e.g.: Aluminium
- e.g.: Copper/Aluminium Alloy
- e.g.: Chromium
A VARIETY OF METALLIC COLORS
SINGULUS TECHNOLOGIES offers a large variety of colors, from mirror chrome and graphite chrome to many color shades.

SUSTAINABLE AND ECO-FRIENDLY PROCESS
The coating process from SINGULUS TECHNOLOGIES offers environmentally friendly alternatives for electroplating with a full replacement of Chrome VI in the future including a large variety of colors.

SAFETY CHARACTERISTICS
The coated components outperform safety requests e.g. in car interiors and open up new horizons in the design of automotive exterior components with holographic appearance.

SEMI-REFLECTIVE
The coatings allow light to pass through. Components with a metallic, glossy or matte look can be fitted with individual ambient or signal lighting.

FUNCTIONAL COATINGS
EMV-shielding, electrically conductive layer (e.g. on components before the electroplating) or antennas. Each electrically conductive and non-magnetic metal and its alloys can be used as a metallic layer.

ANTIBACTERIAL COATINGS
Antibacterial functional layers minimize the risk of infection. The environmentally friendly, low-cost functional coatings that are produced in SINGULUS TECHNOLOGIES vacuum coating systems minimize the risk of infection by the so-called “hospital superbug” MRSA (methicillin resistant Staphylococcus aureus) and by E. coli bacteria, as various studies have shown.

SUITABLE FOR A WIDE RANGE OF SUBSTRATE MATERIAL
Wide range of different materials like plastics, metal, glass and ceramics can be refined with different materials e.g. Al, CuAl, Cr, Ag, Ti and stainless steel.

DAY/NIGHT DESIGN – LASER PROCESSING ON INTERRUPTED CLOSED SURFACES
Laser processing allows controlled removal of the coating so that symbols can be illuminated.

ELECTROMAGNETIC TRANSPARENCY
SINGULUS TECHNOLOGIES PVD coating provide non-corroding surfaces to be manufactured with a metallic appearance, permitting electromagnetic signal transmission.
**POLYCOATER**

Technical Data & Application Sizes

<table>
<thead>
<tr>
<th>POLYCOATER</th>
<th>POLYCOATER 68</th>
<th>POLYCOATER 90</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Production Cycle Time</strong></td>
<td>down to 6 seconds per carrier</td>
<td>down to 8 seconds per carrier</td>
</tr>
<tr>
<td>1 Substrate per Carrier</td>
<td>480 x 130 x 68 mm</td>
<td>480 x 130 x 90 mm</td>
</tr>
<tr>
<td>4 Substrates per Carrier</td>
<td>Ø 90 x 130 mm</td>
<td></td>
</tr>
<tr>
<td>6 Substrates per Carrier</td>
<td>Ø 68 x 130 mm</td>
<td>Ø 68 x 130 mm</td>
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<tr>
<td>9 Substrates per Carrier</td>
<td>Ø 45 x 130 mm</td>
<td>Ø 45 x 130 mm</td>
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<tr>
<td>18 Substrates per Carrier</td>
<td>Ø 22 x 130 mm</td>
<td>Ø 22 x 130 mm</td>
</tr>
<tr>
<td><strong>Substrate Sizes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diameter</td>
<td>68 mm</td>
<td>90 mm</td>
</tr>
<tr>
<td>Height</td>
<td>max. 130 mm</td>
<td>max. 130 mm</td>
</tr>
</tbody>
</table>

**Down to 6 Seconds Carrier Cycle Time**

- **Max. 18 Parts**
  - Carrier equipped with 18 substrates, up to 10,800 parts/h

- **Max. 9 Parts**
  - Carrier equipped with 9 substrates, up to 5,450 parts/h
# Polycoater Specifications

<table>
<thead>
<tr>
<th></th>
<th>Polycoater 68</th>
<th>Polycoater 90</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Machinery Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length</td>
<td>approx. 4000 mm</td>
<td>approx. 4000 mm</td>
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<tr>
<td>Width</td>
<td>approx. 1350 mm</td>
<td>approx. 1350 mm</td>
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<tr>
<td>Height</td>
<td>approx. 1700 mm</td>
<td>approx. 1700 mm</td>
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<tr>
<td><strong>Yield</strong></td>
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<td></td>
</tr>
<tr>
<td>Yield</td>
<td>95 %</td>
<td>95 %</td>
</tr>
<tr>
<td>Uptime</td>
<td>95 %</td>
<td>95 %</td>
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<tr>
<td><strong>Production Side</strong></td>
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<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>independent</td>
<td>independent</td>
</tr>
<tr>
<td>Temperature</td>
<td>25 ± 5°C</td>
<td>25 ± 5°C</td>
</tr>
</tbody>
</table>

- **Max. 6 Parts**
  - Ø 68 mm
  - 130 mm

- **Max. 4 Parts**
  - Ø 90 mm
  - 130 mm

- **Max. Process Area**
  - 130 mm
  - 480 mm
  - 68 mm / 90 mm

- **Carrier**
  - Equipped with 6 substrates, up to 3,600 parts/h
  - Equipped with 4 substrates, up to 1,140 parts/h
  - 6 to 10 sec./Area | 600 to 360 Areas/h
SINGULUS TECHNOLOGIES develops and assembles innovative machines and systems for efficient thin-film coating and surface treatment processes, which are used worldwide in the Photovoltaics, Semiconductor, Medical Technology, Packaging, Glass & Automotive as well as Battery & Hydrogen markets.

The company’s core competencies include various processes of coating technology, surface treatment as well as wet-chemical and thermal production processes. SINGULUS TECHNOLOGIES sees sustainability as an opportunity to position itself with innovative products. In the focus are environmental awareness, efficient use of resources as well as avoidance of unnecessary CO₂ pollution.

SINGULUS TECHNOLOGIES attaches great importance to responsible and sustainable corporate governance.