What Are Printed Electronics?

The term printed electronics refers to the combination of conductive materials, varnish and ink systems transferred in multiple layers to large-area substrates such as film, paper and other materials in a cost-efficient process. They perform functions of conventional electronics with special processing options.

Be it conductive traces, resistors or other technical functions: films, in particular, can be printed or die-cut to feature any desired property. The film remains light, thin and flexible—one of the basic prerequisites for space-saving installation into diverse products.

**Benefits of Printed Conductive Structures**

- Creation of transparent and opaque electrically conductive structures
- Flat, stable, ultra-thin, flexible and translucent
- Automatic or manual application: self-adhesive or non-adhesive
- Bonding by means of connectors or spring contacts—optionally available with additional corrosion protection
Based on printed electronics, the experts from Schreiner PrinTronics develop and achieve particularly thin, flexible, multilayer film products for electrical conduction, switching, measurement and control purposes:

- Printed conductive traces
- Antennas
- Heating elements
- Reflectors
- Multifunctional user interfaces
- Sensors

Schreiner PrinTronics has in-depth know-how:

- Printing of silver, carbon, insulation
- Die-cutting of metal foils
- Bonding
- Industrial roll-to-roll processing
- Combining printed electronics, RFID and marking in a label
Based on in-depth know-how in printing of silver, carbon, insulation and through-hole interconnects, as well as die-cutting of metal foils, Schreiner PrinTronics has developed roll-to-roll printing of electronics to high levels of precision. Conductive traces are achieved by die-cutting or by screen printing of silver and carbon pastes.

**Technical Know-How**
- Flexible films: bending radii, double-sided electrodes without a complex laser structure, compatible with casting processes and in-mold decoration (IMD) processes
- Contacting by gluing, crimping or use of connectors: high conductivity in spite of low film composite thickness, corrosion protection at the contact points for homogenous and stable lifetime functionality
- Ease of application: bulk material, sheet material or continuous on rolls, depending on the process
- Automatic processing: delicate and complex film parts possible thanks to sophisticated technology

**Service Portfolio**
- In-depth technology and product development
- Extensively equipped physical measurement lab and pilot plant to qualify materials and products
- In-house development of new functions and manufacturing processes
- Modular kit system
- Consultancy from the initial application idea to the production stage
- Holistic thinking and practices according to certified quality and security management

**Hallmarks of Schreiner PrinTronics**

**International**
- TRAIN •
- AUDIT •
- CERTIFY

**Security Standards**
Patient compliance monitoring

Heated mirror

Automated driving (distance radar)
Printed electronics solutions by Schreiner PrinTronics are multifunctional and add high value, based on in-depth know-how in the following areas:

- Fabrication of transparent and opaque electrically conductive structures
- Utilization of materials as sensors or actuators
- Achievement of complex electronic functions by printing of resistors and capacitors

Simple, flexible electronics and printing or die-cutting of conductive traces on films enable the production of

- antennas
- operator controls and capacitive touch sensors
- heaters
- resistive sensors such as humidity or first-opening sensors.

Furthermore, there are electric circuitry using printed materials (silver, dielectrics) in challenging environments as well as high- and low-temperature applications. In addition, evaluation electronics, which are conventionally produced using semiconductor chips and interconnected by connectors or clamping, gluing and crimping, are possible.

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**RFID and Sensors**

- Reliable and fast sensing of current moisture/wetness condition
- Sensing of tampering attempts such as cutting, temperature and shock
- Robust RFID labels for application to metal or for outdoor uses
- Reading through plastics, insulants, concrete or wood
- On-site data acquisition as NFC versions and/or as UHF versions
Schreiner PrinTronics’ research and development is focused on the integration of functional conductive structures, chips, LEDs, flat and flexible batteries.

<table>
<thead>
<tr>
<th>Development Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional Displays and Lighting</strong></td>
</tr>
<tr>
<td>■ Integration of flexible, electrochromic film displays with simple color shifting</td>
</tr>
<tr>
<td><strong>Integration of Chips and Component Assemblies</strong></td>
</tr>
<tr>
<td><strong>Integration of Miniaturized LEDs</strong></td>
</tr>
<tr>
<td>■ Points of light for flexible uses</td>
</tr>
<tr>
<td>■ Simple optical signaling for operator controls, warning lamps or touch sensors</td>
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<tr>
<td>■ Various color options</td>
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<tr>
<td><strong>Flexible Batteries</strong></td>
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<tr>
<td>■ Integration of flat, flexible film batteries with several years of battery life</td>
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<tr>
<td>■ Flexible batteries with voltages of up to 1.5–3 V (for example) and 2–5 mA/cm² capacity with defined battery life</td>
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<tr>
<td>■ Independent power supply for sensors, loggers and other applications</td>
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<tr>
<td>■ Use as printed sensors and active RFID transponders for functional probes, memories and indicators/displays</td>
</tr>
</tbody>
</table>