HENKEL PRINTED ELECTRONICS

MATERIALS ENABLING DEBONDING ON DEMAND

Henkel
Adhesive
Technologies

THE PRINTED ELECTRONICS PERSPECTIVE

INTRODUCTION

LOCTITE FUNCTIONAL INKS → **PRINTING** → **PRINTED CIRCUIT or COATING**

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HENKEL PRINTED ELECTRONICS

LOCTITE® PRODUCT RANGE

STANDARD INK PORTFOLIO

CONDUCTIVE INKS

Based on **silver, silver/silver chloride, carbon, copper, and nickel** for **electrical conductivity**.

Used for:
- Membrane switches
- Sensors
- Antennas
...

RESISTIVE INKS

Based on conductive and non-conductive particles to **adjust resistance levels.**

Used for:
- Printed resistors
- Potentiometers
- Heating elements
....

DIELECTRIC INKS

Non-conductive inks used for electrical **isolation and environmental protection.**

Used for:
- Dielectric layers,
- Conformal coatings
- Encapsulations
...

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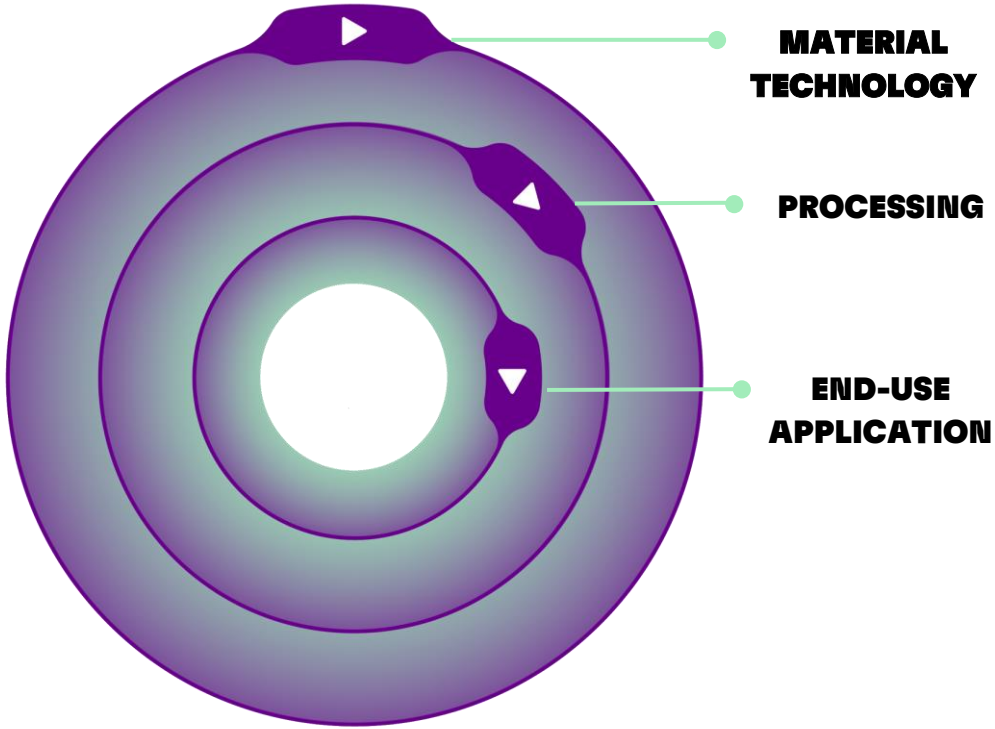
THE HENKEL PRINTED ELECTRONICS PERSPECTIVE

THINKING FULL CIRCUIT

Addressing **sustainability** at **every stage** of the printed electronics **value chain - material technology, processing, and end-use application.**



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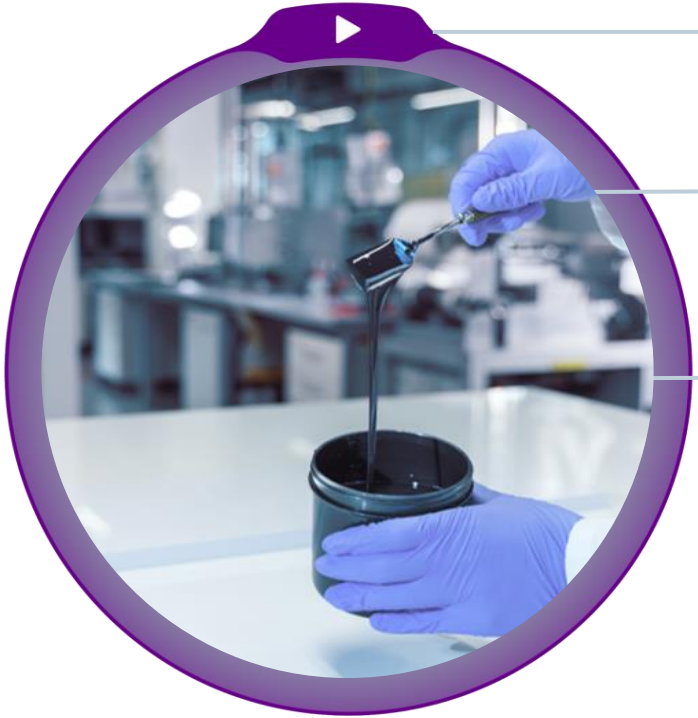
THINKING FULL CIRCUIT



MATERIAL TECHNOLOGY

PROCESSING

END-USE APPLICATION

KEY FOCUS

- 100% **certified recycled silver** Ag-ink: LOCTITE ECI 1014
- Product **Carbon Footprint** (PCF) for many products available
- **LCAs** can be requested manually
- **Recycled** materials
- **Renewable raw materials**
- **Low VOC-products** e.g., water-based inks

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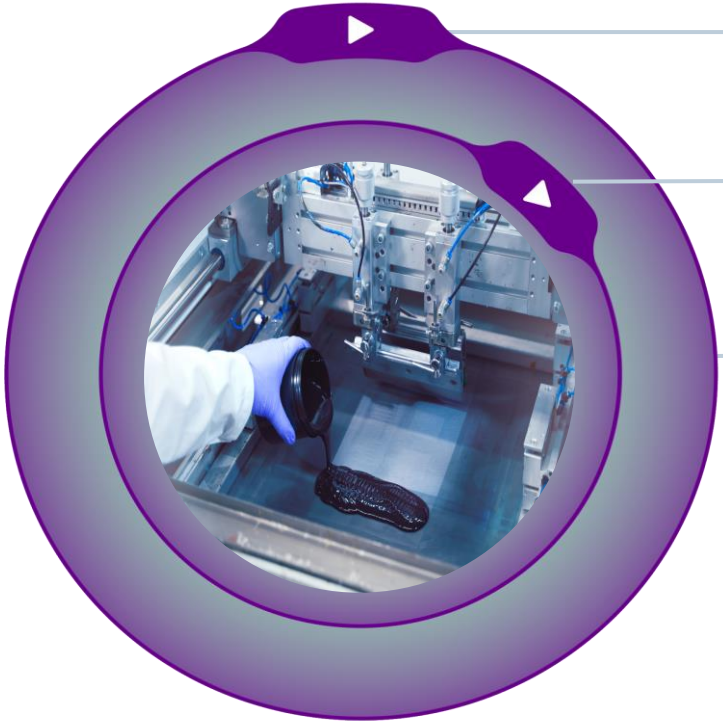
THINKING FULL CIRCUIT



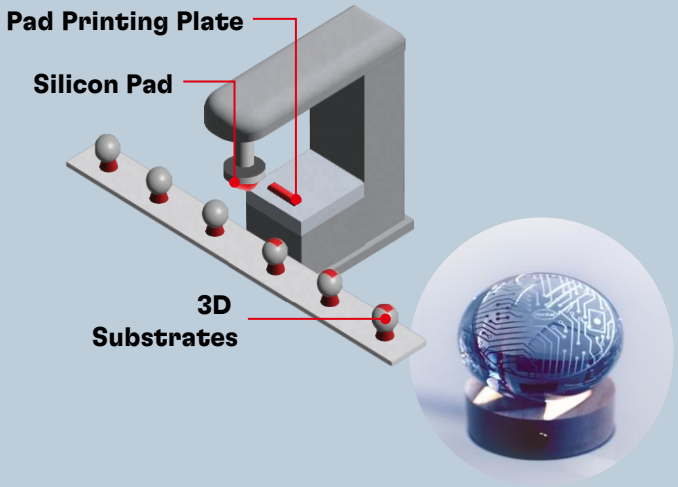
MATERIAL TECHNOLOGY

PROCESSING

END-USE APPLICATION

KEY FOCUS

- **High-speed** printing
- **Reduced energy** consumption
- Direct **printing on 3D** surfaces
  e.g., pad printed antennas



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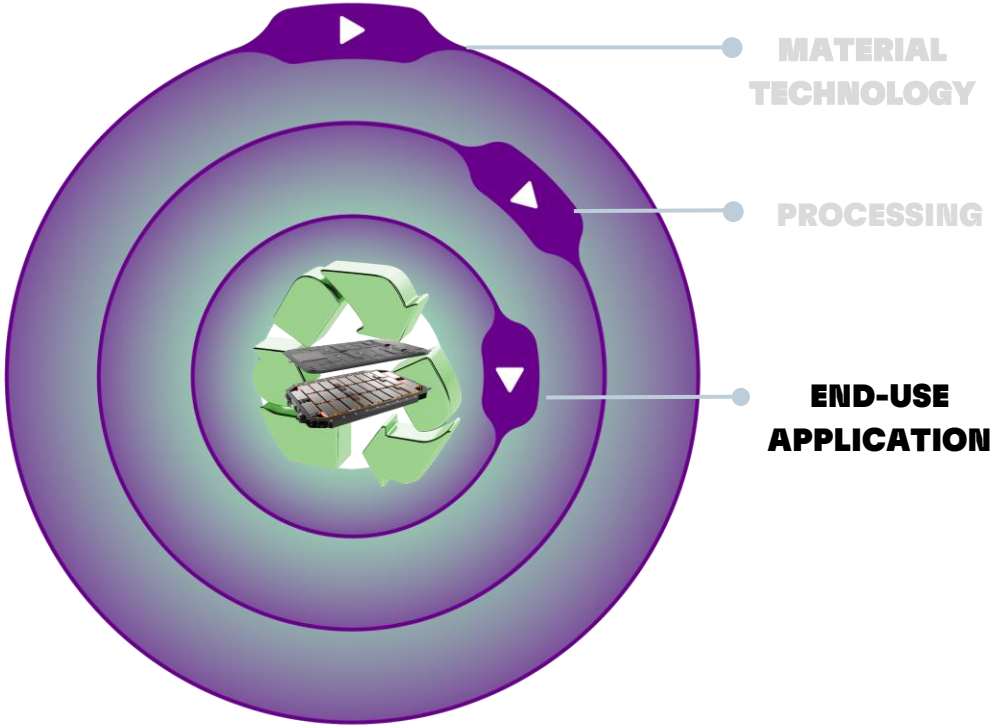
THINKING FULL CIRCUIT



KEY FOCUS

- Enabling **closing the loop & right to repair** e.g., debonding on demand
- **Monitoring:** e.g., water leakage sensors
- **Extending life cycles:** e.g., EV batteries

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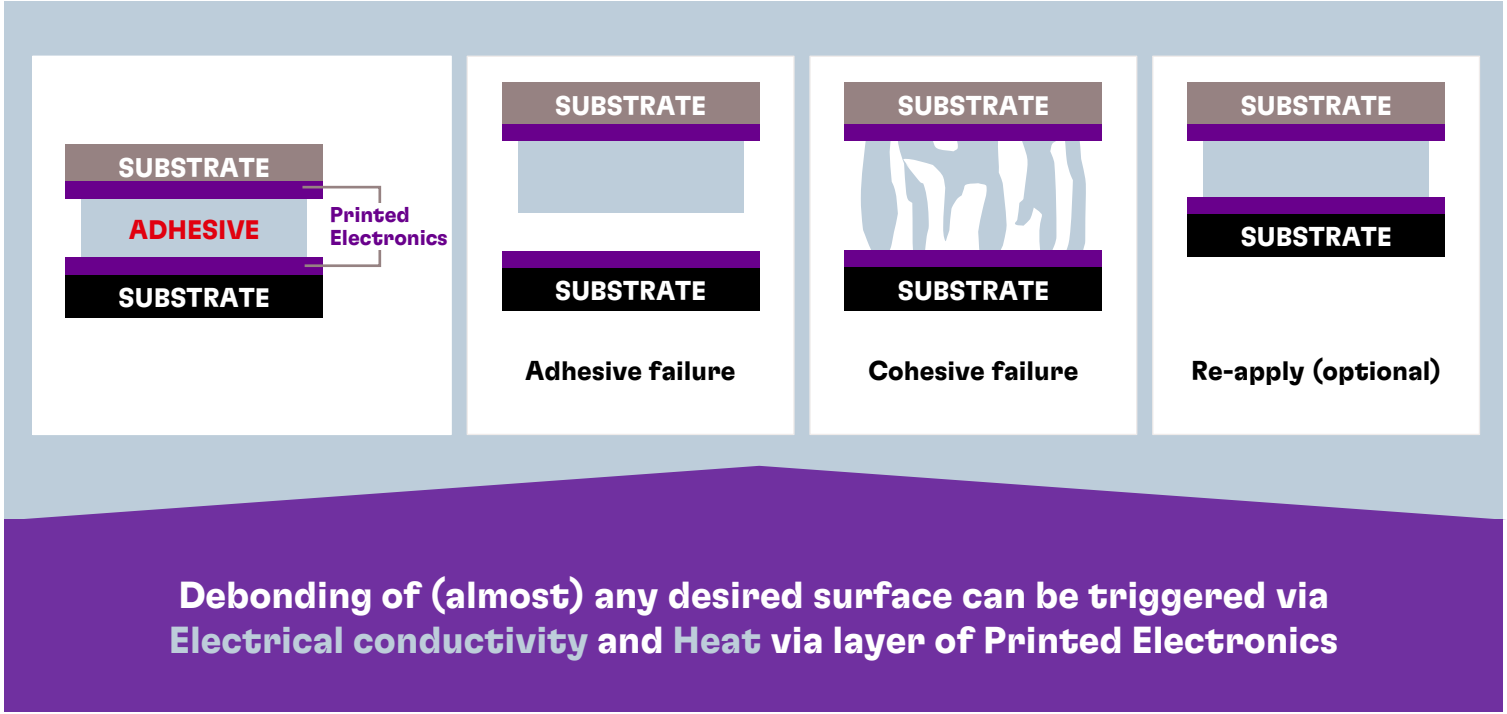
POSSIBILITIES TO DEBOND

THINKING FULL CIRCUIT



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PRINTED ELECTRONICS ENABLE DEBONDING

USE CASE: ELECTRICAL DEBONDING

CHALLENGE

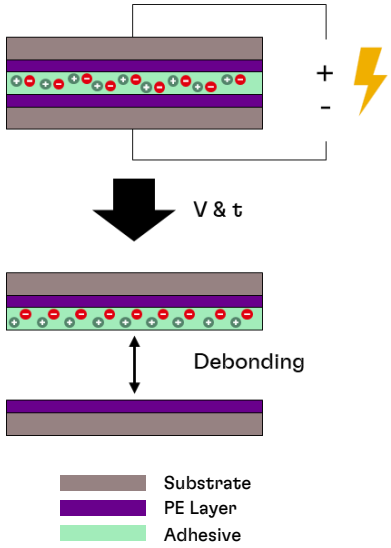
- Local debonding of non-conductive substrates

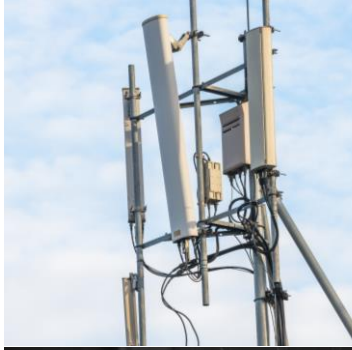
SOLUTION

- Printed Electronics enabling **electrical conductivity** on (almost) any substrate
- **Electrical conductivity** allows for electrical delamination (EDL) in combination with a modified adhesive

BENEFITS

- High **design freedom** and few scrap (vs conductive tapes, or Al foils)
- Suitable for **large areas** and **fine lines** on complex 3D shapes (~300µm width)





PRINTED ELECTRONICS ENABLE DEBONDING

USE CASE: THERMAL DEBONDING

CHALLENGE

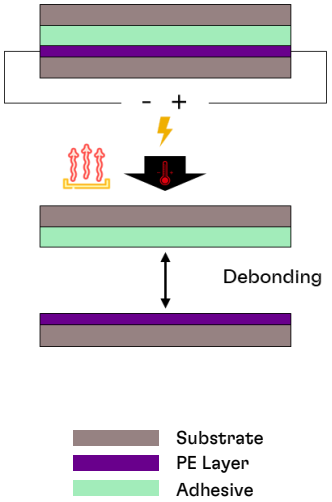
- Temperature sensitive substrates and delicate parts to be debonded from a surface

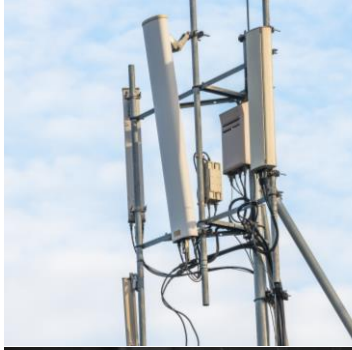
SOLUTION

- **Local heating** in combination with adhesive: Facilitates thermal curing & debonding suitable for sensitive components

BENEFITS

- Requires **one** conductive surface.
- Ranging from **low to high temperatures up to 160°C**
- **No need** for IR transparent substrates, and preventing surrounding components from thermal damage
- High **design freedom** using 2D and 3D printing techniques





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THINKING FULL CIRCUIT

GET IN TOUCH WITH US

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