

# BATTERY POWER PRODUCTS & TECHNOLOGY

Solutions for OEM Design Engineers, Integrators & Specifiers of Power Management Products

## Bayer MaterialScience Paves the Way for Innovative Electronic Applications

Is it at all possible to improve a mundane everyday item such as a pair of tweezers? After all, it has the simplest of forms and has worked reliably for as long as anyone can remember. "Most definitely," is the reply from Ralph Schneider as he reaches for a streamlined item made of plastic with a black head and two transparent arms. As if by magic, the pincers light up, directing the light to the tips and illuminating a small point on the desk top. Perfect for shining the spotlight on a thorn that has to be removed.

"This little item has the capacity to provide the electronics market with new impetus," said Ralph Schneider. The pair of tweezers, developed in a project he supervised, is a prototype that uses an innovative and completely invisible switching technology. Today, the former mechanical engineering student is right in the middle of things instead of just watching events unfold. What began a few months ago as a degree thesis at Bayer MaterialScience AG quickly resulted in a permanent appointment in the Creative Center at one of the biggest plastics manufacturers in the world.

High-quality materials from Bayer MaterialScience are responsible for the high functionality and enabled the progressive design of the Extract tweezers.

A high-tech product in the shape of a lobster claw: the innovation known as "Extract" combines the mechanical properties of chemical materials, which also conduct light or electricity, with electronics. It represents an area of technology that is becoming increasingly important for industry. Specialists call

this new technology "mechoptronics," that is, the interaction between mechanics, optics and electronics.

Eckard Foltin, head of the Creative Center, said, "Our aim is to implement creative solutions to turn our customers' ideas into reality. We refer to this process as VisionWorks". The tweezers combine materials in a way that has never been seen before. In addition to the well-known design-related functions, we have made it possible for them to conduct light and, in future, they will also be able to transfer data. These features pave the way for countless new applications, for example, in the automotive industry."



The tweezers are based on the "SmartSwitchSystem." It lets light flow through the transparent arms when they are touched – without use of either buttons or wires. The "switchless switch" is made of the transparent polycarbonate Makrolon. The plastic is coated with a new polyurethane coating, which Bayer MaterialScience developed in cooperation with its partner company KRD Coatings GmbH. It is abrasion resistant, extremely chemically stable and elastic. The most important characteristic is its electrical conductivity. When the arms are touched, the circuit is completed and the light goes on. The battery, LEDs and other electronic components are integrated in the head of the tweezers. The head is made from the thermoplastic polyurethane Desmopan, which protects the sensitive internal electrical components from mechanical load, dust and water splashes.