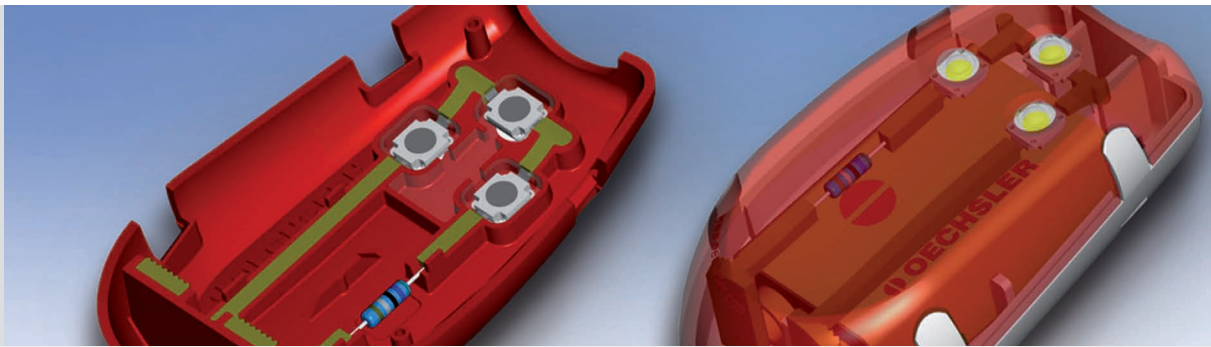


Innovation grows
in a team



Integrating LEDs in injection molding – ready-to-use light bar from one tool

Encapsulating electronic components by injection molding – Electronic Insert Molding | Page 1

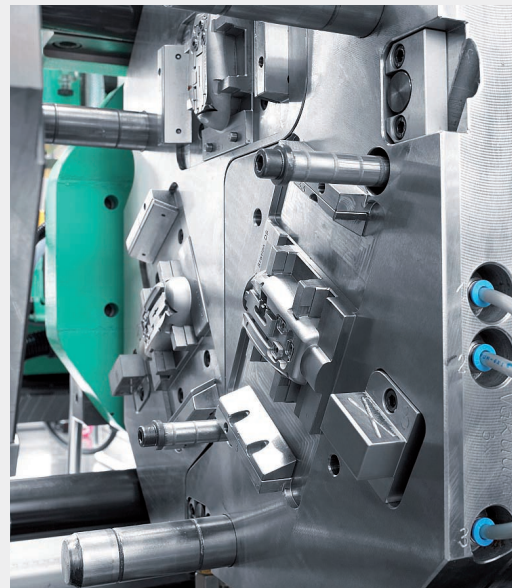
Innovation through partnership – Innovative synergies | Page 2

At a glance – Range of OECHSLER services | Page 2

Taking advantage of synergies between injection molding and electronics

As a renowned developer and manufacturer of technical molded parts, precision and design parts, micro-drives and mechatronic assemblies, OECHSLER has helped to set standards in many lines of industry – from medical and automotive engineering through to communication, light and drive engineering. OECHSLER offers a complete range of services from development to the final product – in the shortest of duration, on time and with a quality and price that is bound to convince.

The growth of miniaturisation and increase in the number of functions in mechatronic assemblies calls for new approaches in engineering and manufacturing. OECHSLER hereby trusts in modern, function-integrating processes in plastics technology such as insert technologies, multi-component technology, inmould labelling or MID technologies. Their great advantage lies in the ability to mold various plastics, including those that have been modified, and the fact that these can be combined with al-



3-Component-turning tool

Modern technologies and methods integrate functions

most any other plastics. The most important development and production issues for optical systems with LEDs relate to

- the position of the LEDs in the assembly,
- the electrical contacts for the LEDs,
- the cooling of the LEDs,
- the integration of optical elements such as reflectors, shades or lenses.

Modern injection molding technologies hereby offer a great application potential through a high degree of integrated functions in the injection molding process.



LED light bar in action



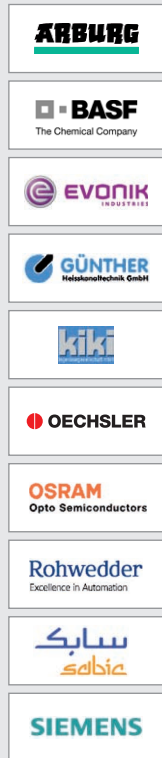
Interior of the upper shell

New product engineering through assembly in the injection mold

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An innovative LED light bar (upper shell of a demonstration torch) has been produced by way of example in a feasibility study using a combination of the aforementioned injection molding methods. A light bar was developed under OECHSLER's supervision that could be fully manufactured by injection molding using 3-component and insert technologies.

via a combined hot-cold runner in a segmented 3-plate design. The conductivity of the conductive strips in the modified PA6 is similar to that of steel. The bottom housing is made of ABS (BASF).



The first step was the injection of a housing of dyed PC (Sabic Innovativ Plastic) onto which three lenses of transparent PA (Trogamid CX, Evonik Degussa) were injection molded in a second step. Three SMD LEDs (Golden Dragon, Osram Semi Conductors) and a protective resistor were automatically inserted into the 3-component rotating tool before the injection molding of the third component, a highly conductive plastic on the basis of PA6 (Siemens AG). Machine and automation technology from the companies of Arburg, Rohwedder and Kiki was used.

The insertion was carried out with standardised adapters as commonly used in the electronics industry. The tool design was specifically adapted to the requirements of the plastics. Whereas the housing and lenses were processed via hot runners (Günther), the individual strip conductors of the conductive plastic were injected



Complete LED light bar

The integration of various functions such as lens, conductive strip, bulbs, resistance and electrical contact in the injection mold saves subsequent production steps and improves quality by shortening the process and tolerance chain. Tests of the long-term behaviour of this light bar show that if the LEDs used are fed with 50mA from a battery, the temperature at the LED remains stable at only 40 °C.

OECHSLER – service range at a glance

- Development of micro- and precision components, assemblies, micro-drives, actuators
- Advice in the choice and design of materials
- High-performance injection molds for standard and special methods
- Manufacture of precision technical components using the latest injection molding and tempering technologies
- Integration of semi- and fully automated handling
- The latest technologies for all common finishing methods: varnishing, galvanising, hot stamping, printing, laser inscription
- Manual, semi- and fully automated assembly; automated test technologies
- Certified to ISO TS 16949, ISO 13485 and ISO 14001

Locations:

Germany

- Ansbach
- Weißenburg
- Kùps

China

- Taicang

Romania

- Lipova



Our Ansbach Headquarter

OECHSLER

Germany

OECHSLER AG | Matthias-Oechsler-Strasse 9 | 91522 Ansbach
Phone: +49 (0) 981 / 1807 - 0 | Fax: +49 (0) 981 / 1807 - 222

Partner:

Susanne Koepfelle | PR/Marketing

Phone: +49 (0) 981 / 1807 - 551 | Fax: +49 (0) 981 / 1807 - 290

email: s.koepfelle@oechsler.com | www.oechsler.com