

A NEW LEVEL OF  
MULTIFUNCTIONALITY

3D MID  
TECHNOLOGY

DISCOVER THE  
POSSIBILITIES



# 3D MID TECHNOLOGY

MID technology (Mechatronic Integrated Devices) enables the manufacture of three-dimensional, injection-moulded circuit carriers as well as the integration of mechanical, electronic, thermal, fluidic and optical functions in almost any type of moulded component. The advantages of this result in a higher degree of miniaturisation, the implementation of new functions and applications, as well as a shortening of the process chain. As one of the worldwide leading single source suppliers of MIDs we, on the one hand, manufacture our own innovative products and, on the other, willingly support our customers with know-how and many years of experience throughout the whole process of product development. Regular participation in research projects rounds off our dedication to the continuous further development of this innovative technology.



# MANUFACTURE OF INNOVATIVE, THREE-DIMENSIONAL CIRCUIT CARRIERS USING THE LDS PROCESS

(LASER DIRECT STRUCTURING)



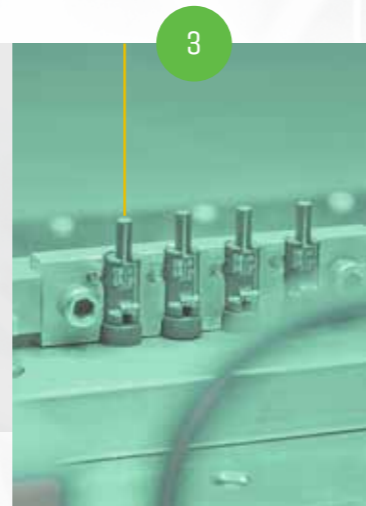
## CAD drawing

CAD data for the plastic base body, the conductor path layout as well as the mounting is produced based on the product idea. All significant parameters for the subsequent component and its production process are taken into account.



## Plastic injection moulding

The circuit carrier is manufactured using the single-component injection moulding process. A wide selection of specially compounded thermo-plastic materials are available.



## Laser direct structuring

In this step the conductor path layout is written onto the component using an IR laser, the surface in these areas ablated and the additive in the plastic exposed and activated.



## Metallization

In the chemical process of electroless metallization a closed conductor path structure is produced (typical layer structure: Cu/Ni/Au)



## Mounting

The completed circuit carrier is suitable for the standard SMT processes and the desired components can now be mounted. Such components can be electronic or mechanical.



## STEP BY STEP TO VERSATILE LIGHTING SOLUTIONS

Conductor path structures can be produced efficiently on three-dimensional components using LPKF laser direct structuring. Changes to the circuit layout merely require the programme to be adapted.

LDS is therefore by far the most frequently used process for producing MIDs.

Mechatronic integrated devices produced using LDS are particularly suitable for functions such as antenna structures (RFID,NFC), connection technology (plugs, encapsulation) and sensory or optical tasks.

*By the way: fully functional prototypes can be produced under close-to-production conditions based on the CAD data.*



MID-LDS technology partners

# ADVANTAGES OF MID-BASED CUSTOMISED PRODUCTS AND IN-HOUSE DEVELOPMENTS

## Flow sensor

- miniaturisation
- produced as SMD
- integration of fluidic, electrical and mechanical functions



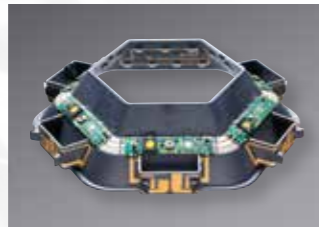
## LED lighting elements

- integrated constant current
- LED retro-fit for halogen solution
- considerably longer battery life



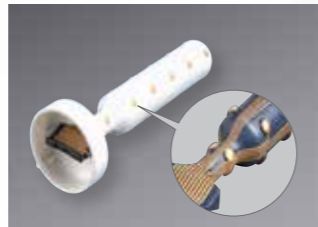
## Modular LED designer light

- integration of sensor technology and interfaces
- hybrid solution MID /circuit board
- automated production process possible by using MID-based, rigid modules



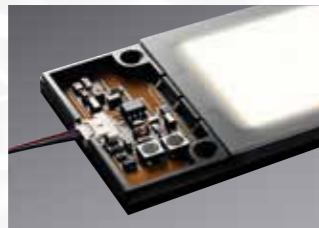
## Continance trainer

- connections integrated in MID
- slim design for patient comfort
- MID overmoulded using biocompatible thermoplastic



## OLED lighting elements

- easy integration into lighting systems
- plug and play solution
- glare-free uniform area lighting by means of integrated electronics
- MID housing as optimum addition to the flat OLED structure



## Electrodes

- 2 variations by adapting the laser programme
- parts automatically processable as SMDs
- use of reflow-soldering for simplification of process



## QUALITY

At 2E quality has top priority throughout the entire supply, development and production chain. Our management system is 100% focused on meeting the needs of our customers and can look back on a longstanding success story. On that you can depend.

## CERTIFICATION

Certification based on the most important automotive and environmental standards is testimony to the path we have successfully taken. But over and above these demands we are also committed to our partners, the environment and the social challenges of our time.

## SUSTAINABILITY

Sustainability must be lived. Each and every day anew and every day with ideas encompassing a future-oriented vision. This, of course, applies to all areas of life and work, in our communication with each other as well as in technical projects.

# OUR PRODUCT RANGE

In addition to MID-based products 2E mechatronic develops and manufactures mechatronic components in Kirchheim unter Teck for a wide range of applications in the areas of automotive, industrial automation as well as medical technology.

Our portfolio comprises plastic hybrids such as sensor housings (e.g. housings for ESP or side airbag sensors), DIN and customised connectors as well as high-precision, fluidic capacitive 360° inclination sensors. Furthermore, we are involved in numerous research projects which pave the way for the emergence of pioneering manufacturing technologies and innovative products.

For further information on our portfolio please go to  
[www.2e-mechatronic.de](http://www.2e-mechatronic.de)

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