

POCAN®

LASER DIRECT STRUCTURING OF MOLDED
PLASTIC INTERCONNECT DEVICES (3D-MIDS)

**NEW POCAN® GRADES WIDEN
THE PROCESSING WINDOW**

LANXESS
Energizing Chemistry

POCAN®

LASER DIRECT STRUCTURING – SIMPLE, PRECISE AND ENVIRONMENTALLY FRIENDLY

Three-dimensional interconnect devices made of plastic (3D molded interconnect devices or 3D-MID for short) offer greater design opportunities than two-dimensional printed circuit boards.

They can also be used to create sophisticated mechatronic systems that combine electrical and mechanical functions. One innovative technology for producing 3D-MIDs is the laser direct structuring process from LPKF Laser & Electronics AG.

This technology can be used to apply conductive tracks and electronic components to the plastic interconnect devices. The procedure is easy, direct and environmentally friendly (without etching fluids). Another advantage is the flexibility for layout changes.

HOW LDS WORKS

Full Additive Process: Selective metallization of thermoplastic injection molded parts **L**aser-**D**irect-**S**tructuring

Principle of laser direct structuring (photograph: LPKF Laser & Electronics AG)



The LDS process is based on thermoplastics that contain a specific organometallic compound to serve as the active component. A thermoplastic of this type is used to produce a three-dimensional molded part. A laser then “inscribes” a high-resolution circuit layout on the surface of this part. The laser beam vaporizes the upper layer of polymer and activates the underlying metallization nuclei of the active component. The activated areas are then plated with copper in a currentless metallizing bath and electro-reinforced if necessary.

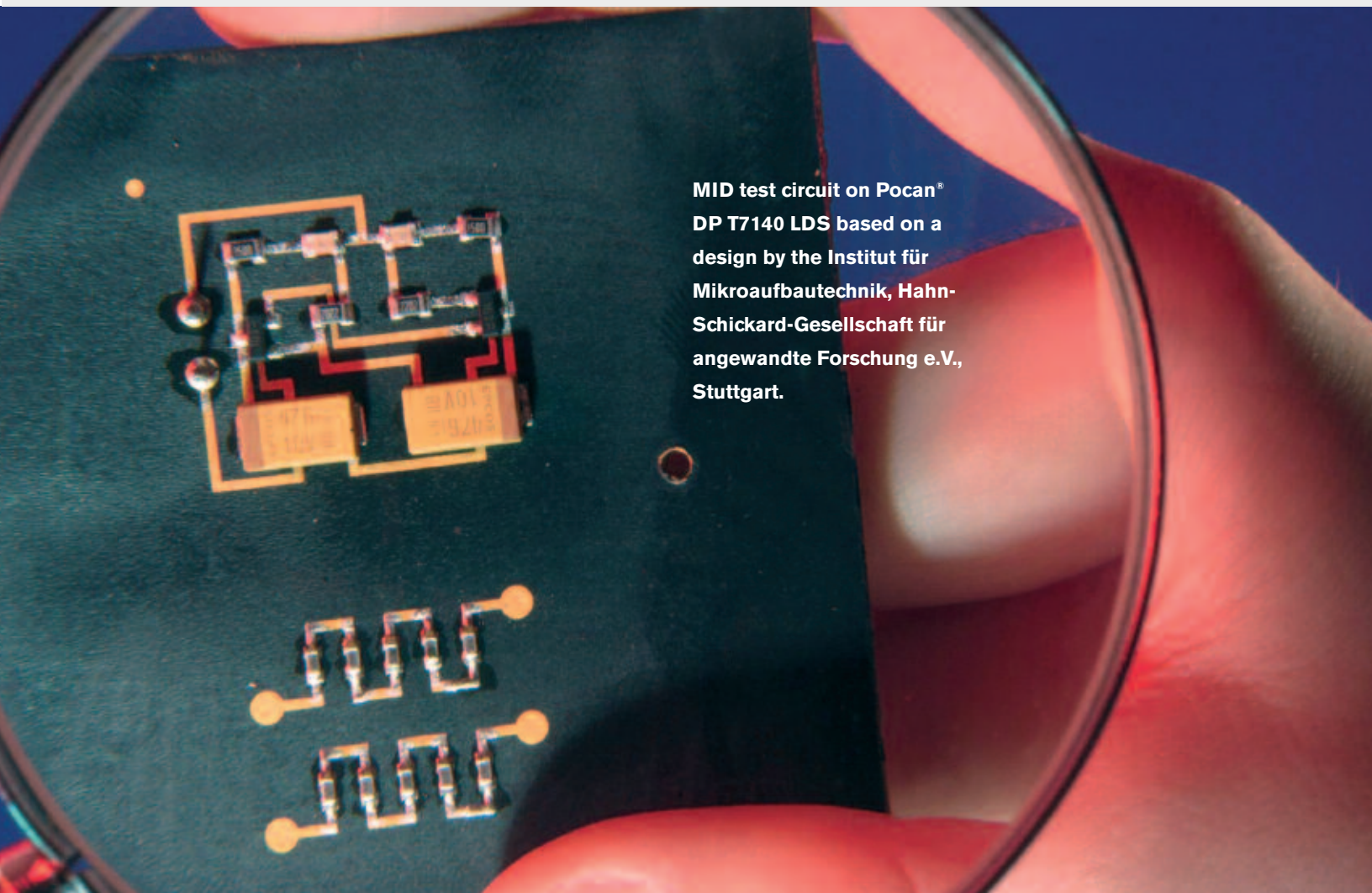
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NEW CUSTOMIZED POLYESTERS

We have developed three new grades of our Pocan® polyester specifically for laser direct structuring (LDS). These products make the entire LDS process much easier to control, since they open up a wider process window, both for laser structuring and the subsequent metallizing step.

The high-heat grade Pocan® DP T7140 LDS has a glass fiber and mineral content of 40 percent and a heat distortion temperature (HDT) (Bf) of 250 °C. This makes the blend of polybutylene terephthalate (PBT) and polyethylene terephthalate (PET) suitable for both reflow and vapor phase welding with lead-free solder. These soldering processes are employed in the production of numerous 3D-MIDs.

Pocan® DP7102 is a PBT developed specifically for injection molding and allows the production of distortion-free moldings with excellent surface quality. We also supply another Pocan® grade that can be used to extrude profiles that are subsequently made into MIDs using the LDS process.



**MID test circuit on Pocan®
DP T7140 LDS based on a
design by the Institut für
Mikroaufbautechnik, Hahn-
Schickard-Gesellschaft für
angewandte Forschung e.V.,
Stuttgart.**

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