

One Small Step for an Ant ...

LaserMicronics assumes LDS production for Festo BionicANTs

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Festo AG & Co. KG from Esslingen has already presented a few engineered structures based on models from nature in the past. At this year's Hannover Fair, the company has chosen to demonstrate collaborative ants – BionicANTs working together on tasks they could not accomplish alone. The BionicANTs owe their compactness and functional exteriors to LPKF technology: thanks to the LDS process, they carry electronic components and traces on their bodies.

If it has to be small and compact, it has to be an MID (Mechatronic Integrated Device), a device with both mechanical and electronic functions. MID technology is dominated by the Laser Direct Structuring (LDS) process. In this process, a laser beam writes the desired structures on a plastic body, which is produced by injection molding of an LDS-doped plastic. The traces are subsequently built up in an electroless metallization bath, thereby yielding three-dimensional molded interconnect devices.

3D MIDs reduce space requirements and weights of component assemblies by serving as component substrates, antennas, and interconnection elements. Thanks to laser technology, it is possible to change the circuit layout without using any additional tools simply by changing the patterning layout data. Up to now LDS MIDs have been widely used as antennas in smartphones and tablet computers as well as in the automotive industry, medical technology, and consumer electronics.

Festo used a sophisticated procedure for the BionicANTs. The body and the legs were created by 3D printing and coated with LPKF ProtoPaint LDS, a paint containing LDS additives to allow further processing of the coated component as an LDS-doped plastic. LaserMicronics GmbH, a specialist in technology scouting and manufacturing service provision for the LDS process, performed the process development and production tasks.

With the 3D MID technology, it was possible to accommodate all mechanical and electronic functions on a product just 13.5 cm in length. The bionic technology demonstrator shows how autonomous individual components in a networked system can comply with different rules and still work together to solve a complex task – here, high-tech design and high-tech

production go hand in hand.



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The Festo BionicANT's body and legs are produced by 3D printing. Thanks to LPKF ProtoPaint LDS, traces and electronic components can be placed right on the "skin."

About LPKF

LPKF Laser & Electronics AG manufactures machines and laser systems used in electronics fabrication, medical technology, the automotive sector, and the production of solar cells. Around 20 percent of the workforce is engaged in research and development.