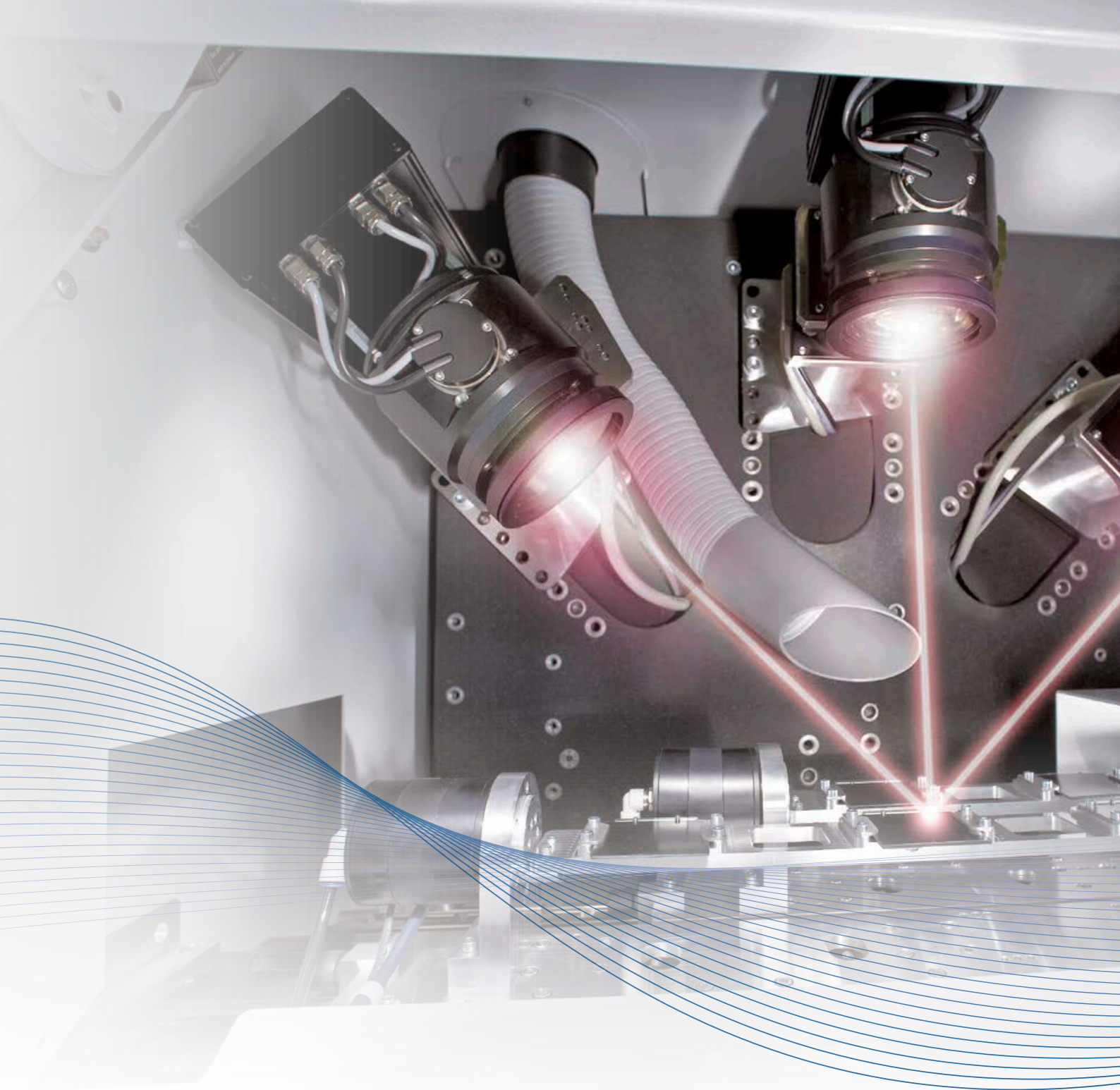


Large Components in LDS Processing

LPKF Fusion3D 1500





Step by Step ...

In the last years, laser direct structuring (LDS) has proven itself in series production a million times over. The technology has been continuously refined and developed and is now overcoming previous limitations related to component length. The LPKF Fusion3D 1500 maximizes the benefits of cutting edge LDS technology by combining the capability of the LPKF high-performance structuring unit with the flexibility of a compact system.



LDS technology advantages:

- For large components
- Flexible production planning
- Fewer parts required
- Upgrade options available

New Layout

Manufacturers benefit when components can be omitted. This reduces production costs and minimizes assembly outlays. But above all, it saves space. LDS proved its capability to eliminate components long ago with smart phone antennas.

LDS technology enables designers to meet ongoing demands for integrating more functions in ever-smaller spaces. With the LDS process, already existing plastic components take on electronic functions in addition to their mechanical tasks.

Almost any plastic component can have conductors precisely and reliably integrated.

A retaining clip thus becomes the WLAN antenna, and active components can be placed on the back of the screen cover. The entire laser system is optimized for this application, with precise linear actuators, a high-quality laser processing unit and room for further upgrades.

LPKF Fusion3D 1500



Key features:

- Working range: max. 2 x 400 mm x 78 mm x 80 mm (L x W x H)
- Precise linear drivers
- Simple fixture design
- Upgrade option for multiple processing unit controller (MPC) and up to 3 processing units

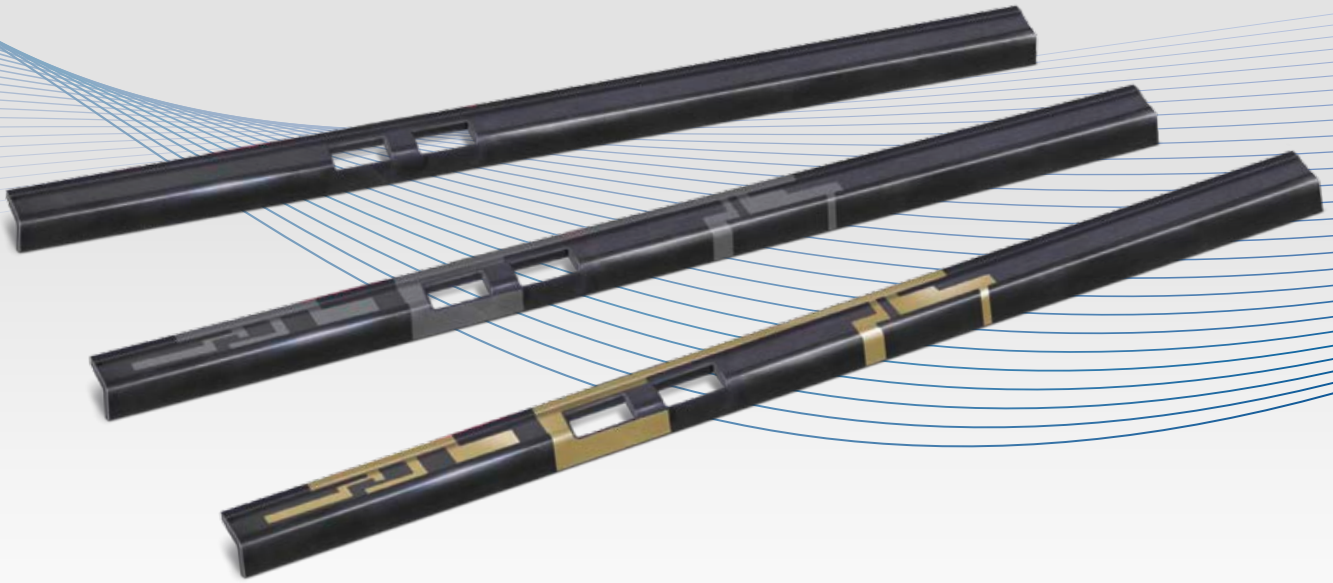


Proven Technology

The LPKF Fusion3D 1500 is a system that transfers the proven LDS technology of smart phone antennas to larger components. The whole system comes in a compact enclosure with handling module and linear actuators that offer precise motion and control.

Components are moved into the processing area by a linear system with two drives. Structures can be produced up to 400 x 78 mm large and with a maximum height of 80 mm. While one shuttle is processed with the laser, the second moves into position, almost completely eliminating non-production time.

A multi-head configuration of the laser system gives further performance gains. With an optional upgrade to a multiple processing unit controller (MPC), up to three processing units can be installed to share the structuring tasks – with considerable advantages for the system's throughput.



Simple Component Support

The laser process itself is contact-free. Thus the requirements for the component supports are slight in comparison to the tools needed for other processes. The component supports merely have to ensure the exact infeed of the component to the laser beam. Fixing of the components takes place via clamps or by low pressure; alignment pins give precise positioning. In practice, accuracies of $\pm 25 \mu\text{m}$ are achieved over the entire structuring process.

LPKF provides advice on component support design. Production services are also available. Each support set is extensively tested and delivered with a test record.

Low-Maintenance Linear Actuators

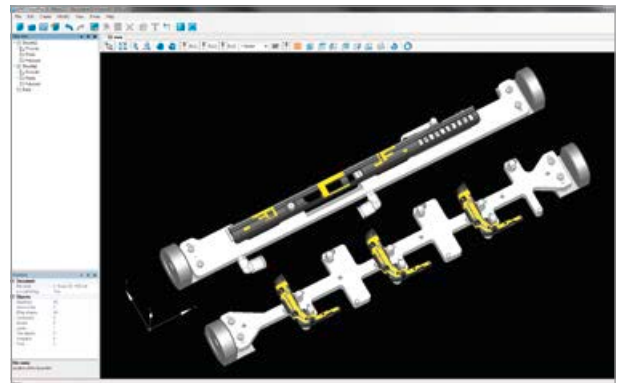
Exceptionally precise and economical, the linear actuators used are exactly coordinated with the laser process and impress with their long service life and minimal maintenance requirement.

Safety First

In normal operation with a closed hood, the LPKF Fusion3D 1500 laser structuring unit conforms to laser class 1. The equipment opening of the handling module is secured with a light curtain to protect against manual intervention during movement of the linear axes.

High-Performance System Software

From the layout program onto the component – the LPKF CircuitPro3D system software controls all laser structuring units in the LPKF Fusion3D line. It transfers data from the layout programs and allows optimization of the process sequence, eliminating non-productive time and increasing throughput.



Structuring Large Components

The laser is a precision tool that runs in a defined operating range. High-frequency applications like complex antennas depend on an exact correspondence between the layout and processing result. Lengths that exceed the scanning field are processed by stitching together several structuring processes.

In this additive process the metallization is built up on the structured surfaces and seamlessly bridges the connection areas, a key advantage of LDS technology.



Gaining Flexibility

LPKF Fusion3D 1500 is a major bonus for production planning. It is hardly possible to design manufacturing processes to be more flexible than they are with this system.

With laser direct structuring, changing a production process over is as simple as just loading a new project file. But the LPKF Fusion3D 1500 goes even further: In each shuttle, it can use a different fixture and also carry out different processes for them.

The result: two products can run in parallel in a single laser system – ideal when there is an urgent need for components. The laser structurer is also suitable for manufacturing product pairs together (such as right-hand and left-hand side components).



Additional Applications for LPKF Fusion3D Systems

The LDS technology is also ideal for processing other materials and applications that profit from the non-contact laser process, such as the ablation of gold or silver layers from ceramics. The Fusion3D systems are also able to engrave metal surfaces, cut flexible PCB foils, and trim ceramic resistors.



Faster Product Development

24/7 industrial design cycles are no problem for the proven laser direct structuring unit from LPKF. Trained service personnel are available worldwide for start-up and servicing. An application center helps with feasibility studies and machine design, and job-order manufacturing helps with production peaks and series start-up: LPKF is committed to working with its customers to create solutions for any product need.

Technical Data: LPKF Fusion3D 1500	
Laser class	1
Number of processing units (PU)	1 – 3
Input data formats	IGES, STEP
Software	LPKF CircuitPro3D
Machine dimensions (W x H x D)	1 740 mm x 1 877 mm x 1 680 mm (68.5" x 73.8" x 66")
Machine weight	Approx. 1 600 kg (3 527 lbs), excluding exhaust unit
Operating conditions	
Electric supply	400 V three phase, 50/60 Hz, approx. 7.2 kVA
Cooling	Air-cooled
Ambient temperature	22° C ± 2.5° C (71.6° F ± 4° F)
Humidity	Max. 60 %
Exhaust unit	Required; available as an option
Machinable materials (selection)	Nickel, copper, stainless steel, LDS plastics, powder coatings and LDS paint, gold and silver paste, ceramic, tin

Worldwide (LPKF Headquarters)

LPKF Laser & Electronics AG Osteriede 7 30827 Garbsen Germany
Phone +49 (5131) 7095-0 info@lpkf.com www.lpkf.com

Hong Kong

LPKF Laser & Electronics (Hong Kong) Ltd.
Phone +852-2545-4005 hongkong@lpkf.com www.lpkf.com

North / Central America

LPKF Laser & Electronics North America
Phone +1 (503) 454-4200 sales@lpkfusa.com www.lpkfusa.com

Japan

LPKF Laser & Electronics K.K. Japan
Phone +81 (0) 3 5439 5906 info.japan@lpkf.com jp.lpkf.com

China

LPKF Tianjin Co., Ltd.
Phone +86 (22) 2378-5318 sales@lpkf.cn www.lpkf.cn

South Korea

LPKF Laser & Electronics Korea Ltd.
Phone +82 (31) 689 3660 info.korea@lpkf.com www.lpkf.com



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