

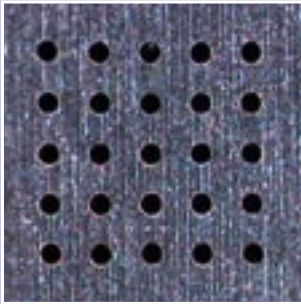
## LPKF MicroCut

Discover the new standard in stencil fabrication

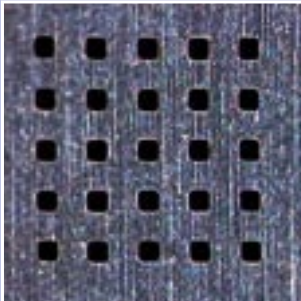
- Highest throughput for all kinds of geometries – up to 50,000 apertures/h
- Burr-free cutting using a new cutting technology
- LPKF PulseShape technology eliminates thermal effects on material

# LPKF MicroCut For the heaviest demands in Packaging, BGA and Flip Chips

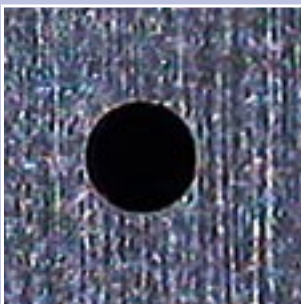
## High density applications



**Application Waferbump**  
5 x 5 apertures, 50  $\mu\text{m}$  diameter,  
up to **50,000 apertures/h** (14/sec)



**Application Waferbumping**  
5 x 5 squares, 50  $\mu\text{m}$  edge length,  
up to **40,000 apertures/h** (11/sec)



**Application LTCC Stencil**  
1 x apertures, 125  $\mu\text{m}$  diameter  
up to **40,000 apertures/h** (11/sec)



**Application EL Stencil**  
Rectangles, 300 x 60  $\mu\text{m}$ ,  
up to **25,000 apertures/h** (7/sec)

## The market and its challenges

The competitiveness of the semiconductor market drives manufacturers toward new and **more economical packaging solutions**. Printing solderpaste directly on interposers and flip chips through stencils is one of the **most cost-effective** methods of package interconnection.

These stencils must meet demanding and exact specifications. LPKF meets these challenges with the MicroCut, combining several new technologies into one unique machine. The LPKF MicroCut sets **completely new standards in stencil printing**, resulting in a **significant increase in productivity, precision and flexibility**.



Turbo Cut

## Combining economic efficiency with time savings and cost reductions

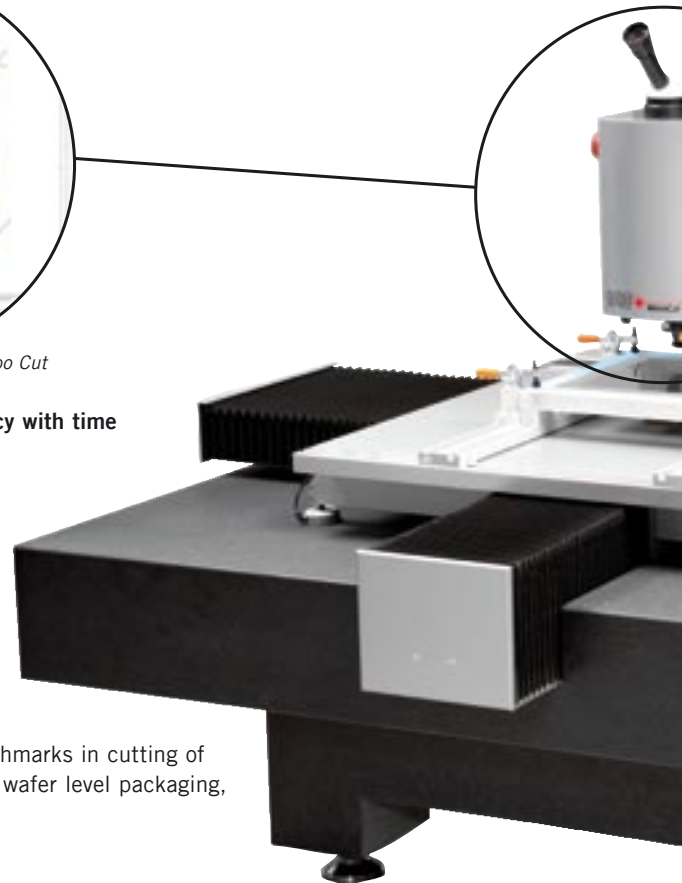
One of the primary features of the LPKF MicroCut is the **Turbo Cut**, a specially developed beam deflection system to move the laser beam over the work surface. Its **superior dynamics and precision** elevate the LPKF MicroCut beyond former benchmarks in cutting of all types of stencils including wafer level packaging, BGA or flip chips.

## Highest throughputs

The LPKF MicroCut produces stencils with up to several hundred thousand apertures, with openings as small as 50  $\mu\text{m}$  (2.0 mil) and at rates as high as **50,000 apertures per hour**. This extremely high throughput results in a significant increase of stencil cutting productivity.

## New quality demands for stencils

Packaging and flip chip stencils require a precise solder volume, constant stencil thickness, and exacting compliance with the aperture geometry and size. Cutting system dynamics and laser focus play a crucial role. **The LPKF MicroCut is able to cut a radius as small as 10  $\mu\text{m}$  (0.4 mil)** and even with high density cutting, the system produces no distortion of tensioned stencils.



# n the stencil technology – Wafer Level

## Release characteristic

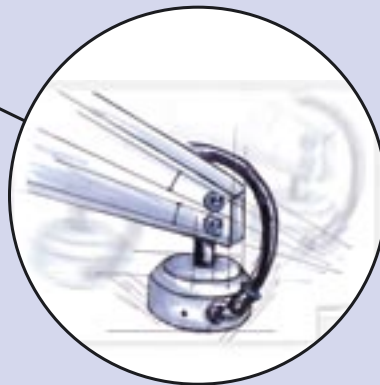
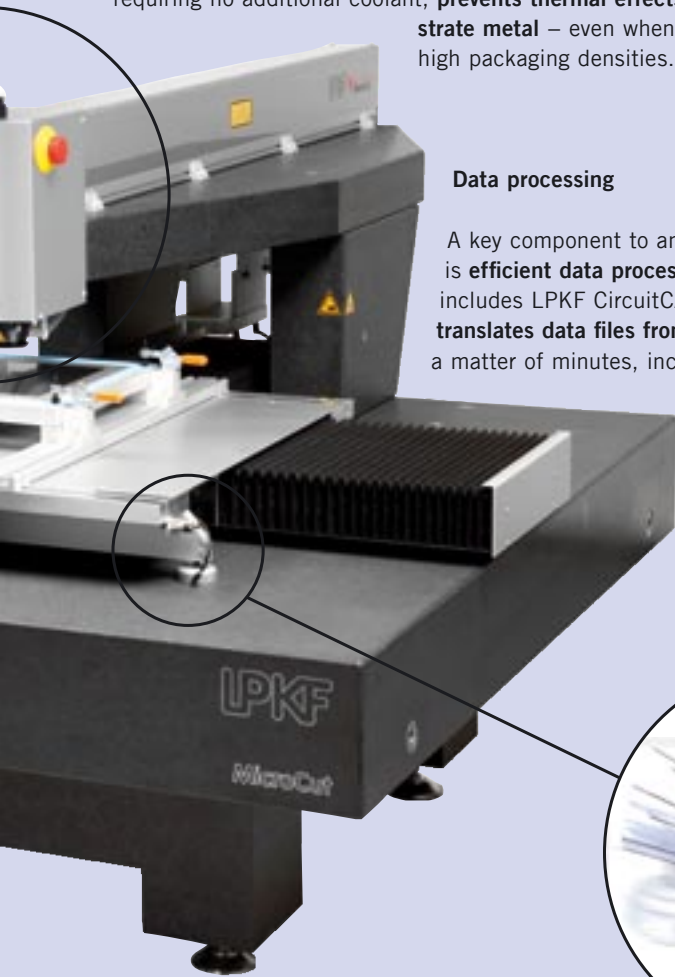
The MicroCut permits **precise control** over the laser cutting angle, producing optimal adjustable angles of the aperture wall. **This improves the release characteristic of the solder paste and contributes to a complete, high quality print.**

## Thermal stability due to LPKF PulseShape technology

The LPKF MicroCut produces edges that are virtually burr-free, regardless of size or count of cuts. The **LPKF PulseShape function**, developed especially by LPKF and requiring no additional coolant, **prevents thermal effects and distortion of the substrate metal** – even when using thin materials with high packaging densities.

## Data processing

A key component to an efficient production system is **efficient data processing**. The LPKF MicroCut includes LPKF CircuitCAM software, **which quickly translates data files from a wide variety of sources** in a matter of minutes, including subdivision of the processing phases and conversion of the cutting vectors. **Modifications of pad geometries and sizes are quick and easy.**

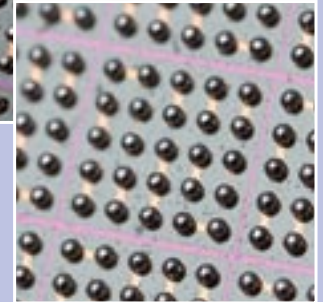
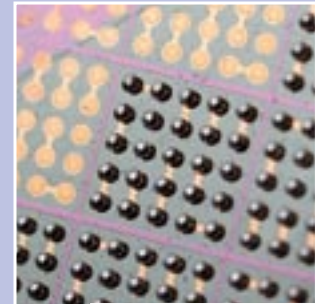


## An investment in the future: LPKF MicroCut

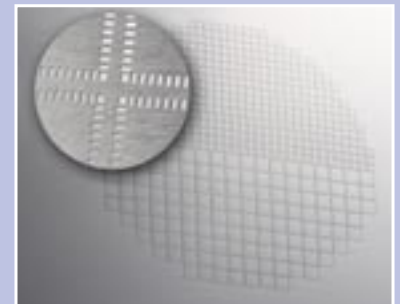
An average **up-time of 99.5% over the past ten years** reflects LPKF's system **reliability** and smoothly functioning customer service.

**The LPKF MicroCut enables a very fast Return on Investment (ROI) due to its high productivity and its capability to open new markets.**

## Wafer Level Packaging applications



*Application Wafer with Solderballs*



*Application Waferbump*



*Application Waferbump*



*Waferbump stencil ready for printing process*

Technical data LPKF MicroCut	
Cutting performance	up to 50,000 apertures/h
Cutting range	600 mm x 600 mm (23.6" x 23.6")
Material thickness	up to 600 µm (24 mil)
Minimum aperture size	30 µm diameter in 30 µm foil (1.2 mil)
Maximum speed	150 mm/sec (6"/sec)
Repetition rate	up to 5 kHz
Axial precision (X/Y axis)	±2 µm on full working area (20 °C ±0.5 °C)
Right-angle-precision	less than 2 angular seconds
Repeatability	±1 µm
Dimensions of XY table (L x W x H)	2,300 mm x 1,750 mm x 1,350 mm (90.5" x 68.9" x 53.1")
Dimensions of controller (L x W x H)	950 mm x 600 mm x 1,900 mm (37.4" x 23.6" x 74.8")
Overall weight	3,500 kg (7,716 lbs.)
Specifications are subjects to change without notice	

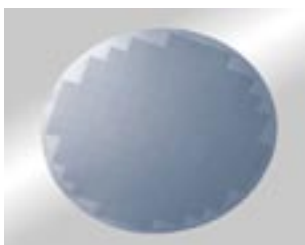
## Inspection with LPKF ScanCheck MicroView



The LPKF ScanCheck MicroView system examines stencils and masks made with any technology including laser cut, chemical etched or electro-formed. The system checks for missing apertures, misplaced apertures or incorrect size of apertures. These are all compared against the data.

The system's programmable resolution can be set at 5,000 dpi for fast scanning performance to test for missing apertures. The full 25,000 dpi measures precisely aperture position, size and quality.

After testing, the system produces a full report of missing, incorrect size or misplaced apertures or for all apertures.



*An LPKF ScanCheck MicroView offers 100% control of stencil fabrication at the highest possible quality and that control and quality translates to a better product and happier customers.*

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