LMI TECHNOLOGIES

CASE STUDY ZOLLER expect great measures

ZOLLER INTEGRATES MIKROCAD SURFACE METROLOGY SYSTEMS WITH THEIR CUTTING TOOL MEASUREMENT SOLUTIONS

ZOLLER designs, manufactures and distributes cutting tool presetting and measuring machines, as well as manufacturing organization systems to help clients increase productivity and save costs. These systems for measuring the cutting edges of tools are an integral part of the ZOLLER product line. The company currently staffs sales and service representatives locally in 48 countries worldwide.

ABOUT THE CLIENT

E. Zoller GmbH & Co. KG, Stuttgart was founded in 1945 with the vision of providing cost-efficient manufacturing in cutting tool production. A leader in innovation and quality in the measurement sector, today ZOLLER is a major supplier of cutting tool measurement systems, inspection and presetting systems, and tool management solutions for the global market.

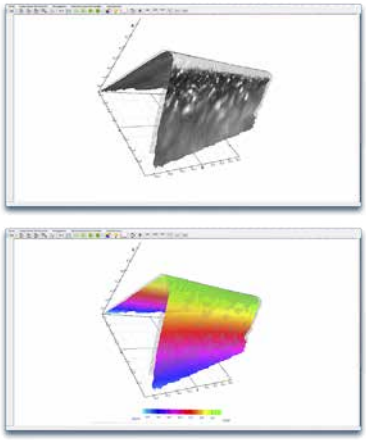
The Challenge

Edge preparation (*Schneidkantenpräparation* in German) is essential to ensuring peak cutting tool performance and optimized tool life. Measuring cutting tool edges and angles, however, is a very challenging application, requiring precision 3D data over a small area, on a variety of materials.

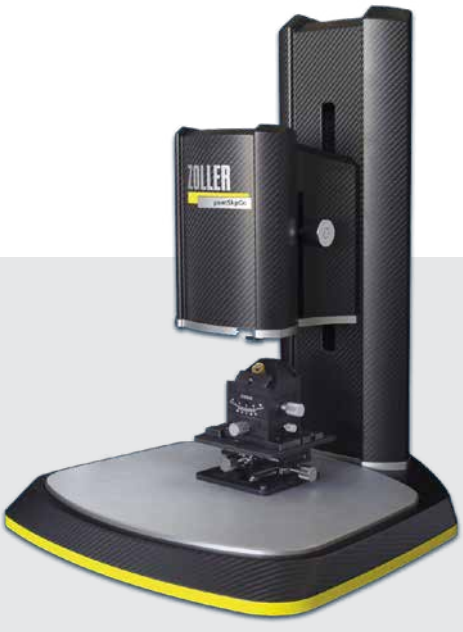
Approximately 7 years ago, ZOLLER was searching for a trusted supplier of 3D solutions that would offer the best price/performance for their Skp applications. At that time many of the 3D solutions available on the market fell short of their performance requirements:

Infinite Focus: In this system, 3D points have to be calculated from a "correlation matrix". In a correlation matrix the 3D point cloud is smoothed out and therefore, in comparison with stripe projection, requires a higher magnification to scan the target.

Confocal Microscopy: Used primarily as a complementary technology for single crystalline diamond tools. Requires multiple scans to capture X-Y data for each Z plane movement, is time-consuming and unable to handle steeply angled geometries (important for cutting tool metrology), expensive, has a very small working distance starting from a maximum of approximately 12mm.



ZOLLER pomSkpGo 3D Edge Scans



The Solution

ZOLLER turned to LMI's MikroCAD 3D scanners, which use structured light fringe projection profilometry to achieve sub-micron level 3D edge scans in just seconds. This technology allows MikroCAD to capture full X-Y-Z point clouds of the cutting edge geometry after multiple fringe patterns are projected onto a single Z plane.

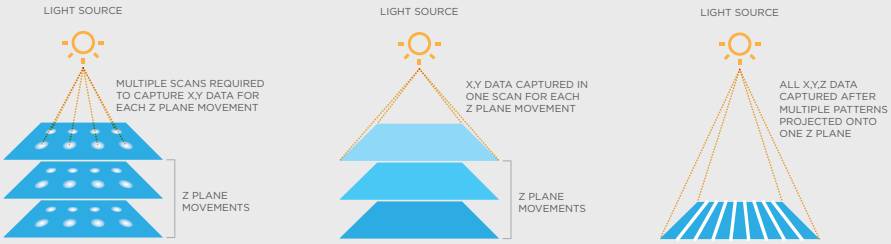
The Solution continued page 2

The Solution

MikroCAD doesn't require time-consuming Z plane movement, unlike many competing 3D scanning technologies *(as illustrated below)*.

The need for higher magnification has the following disadvantages:

- Shorter working distance to the target
- Smaller FOV for the same X-Y resolution
- Limited visibility of the edge for positioning
  (since a very small area of sharpness is the basis of the measuring principle)
- The need to work with interchangeable scan objectives means higher costs and more complex handling



CONFOCAL MICROSCOPY

WHITE LIGHT INTERFEROMETRY (WLI) MICROSCOPY

FRINGE PROJECTION MICROSCOPY

Key advantages of MikroCAD's structured light fringe projection scanning include:

- The ability to precisely measure shiny and steeply angled surfaces, independent of surface material, which is critical for cutting edge inspection.
- The ability to view 3D surface topography in real-time at zoom level and angle, with near perfect lighting, optimized color palettes and intuitive image enhancement tools.
- Intelligent filters to remove outliers and prepare the surface for analysis.
- Ability to separate surface roughness and waviness using advanced ISO 16610 filtering techniques, as well as characterize surface texture by the latest 3D parameters and ISO 4287 2D profile parameters.

LMI currently supplies ZOLLER with MikroCAD Lite and smaller Premium scanners on an original equipment manufacturer (OEM) basis. Standard MikroCAD scanners are supplied without external packaging for faster and easier integration into complete inspection systems. LMI scanner software is provided with the hardware devices, and ZOLLER adds further application-specific software enhancements upon delivery.

The Results

ZOLLER's integrated solution achieves superior results with fringe projection 3D scanning, analysis and reporting used in the cutting edge preparation of precision cutting tools.

Incorporating the latest generation sensor technology, this integrated solution helps users optimize their cutting tool measurement systems for performance and price.

The partnership between ZOLLER and LMI has resulted in a cutting tool measurement solution that outperforms established technologies such as infinite focus and confocal microscopy, and achieves results faster and at a fraction of the cost.

To learn more about MikroCAD 3D Scanners, please email contact@lmi3d.com

AMERICAS
LMI Technologies Inc.
Burnaby, BC, Canada

EMEAR
LMI Technologies GmbH
Teltow/Berlin, Germany

ASIA PACIFIC
LMI (Shanghai) Trading Co., Ltd.
Shanghai, China

LMI Technologies has offices worldwide. All contact information is listed at lmi3D.com/contact