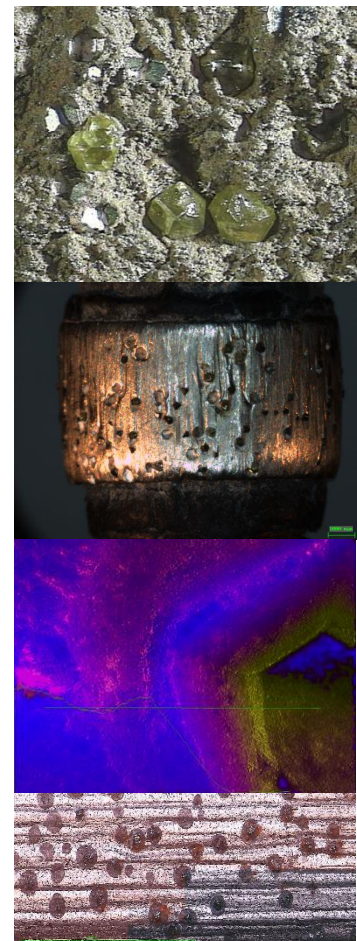




DialInspect.ISE

segment and wire saw bead analysis module

*(additional hard and software tool for the **DialInspect.OSM**)*



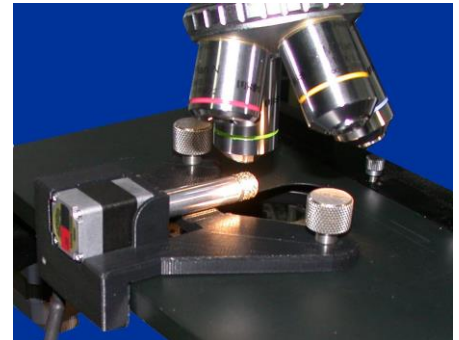
The optical scanning microscope **DialInspect.OSM** has conquered a new application
– the analysis of beads of the diamond wire saw.

Principle:

The segment scan module **DialInspect.ISE** allows the easy measuring and analyzing of a segment or wire saw bead. The module consists of an additional rotation axis and the enhanced software module **DialInspect.ISE** for the segment analysis.

Hardware:

A rotation axis was added to the XYZ-drives of the computer-controlled microscope. This axis is equipped with a clamping mechanism for the easy fixture of single beads. The resulting motion directions are: rotation around the bead axis, scan along the bead axis and focus in radial direction.

**Software:**

The software acquires automatically an overview over the complete bead surface. The interactive evaluation of the wear stage of the diamonds, which show up in the overview image, is supported by extensive software facilities. Diamonds selected in the overview image can be automatically centered in the live video display and can be inspected at different magnifications. Measuring results in all three dimensions can be easily transferred to the database for this bead. A multifocus procedure creates sharp images from a stack of images acquired at different focus levels.

Clearly visible markers indicate those diamonds in the overview, which have been inspected already.

The properties of every diamond can be documented by text comments and snapshots at different magnification levels.

The software produces a detailed set of information in form of an EXCEL file, which can be easily processed later on.

The available data for every diamond are:

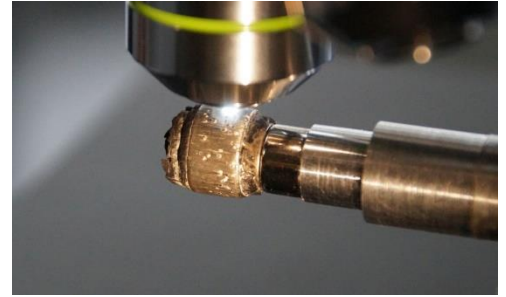
- Location on the bead
- Wear stage
- Text comment
- Numerical data in axial and angular direction
(depending on the evaluation procedure)
- Numerical data in radial direction
(depending on the evaluation procedure, for example protrusion height)
- List of the associated images

The overview image will indicate visually the distribution of the different wear stages along the bead surface. The analysis of the EXCEL file will show you if the wear stages are well balanced, if the diamond distribution is as expected and much more information.

Sample preparation

Wire Saw Bead

The wire saw bead is clamped to the additional rotational axis.



Segment

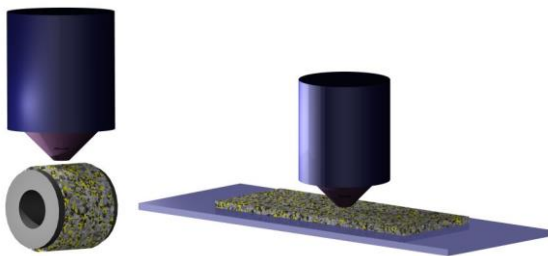
The sample holder (76x26 mm) with the mounted segment is loaded in the same way as the microscope slide. With help of a marker (a dot on the microscope slide), the data base can go back to the real segment at every time. So we have a connection between the real segment and the results in our database.



Program operation

Step 1

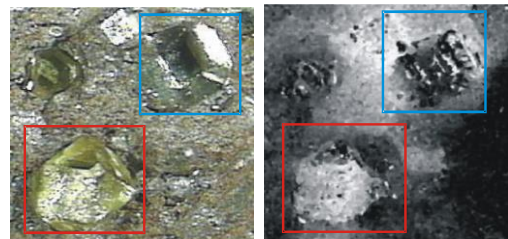
OVERVIEW IMAGE



At first, we produce an overview-picture

Step 2

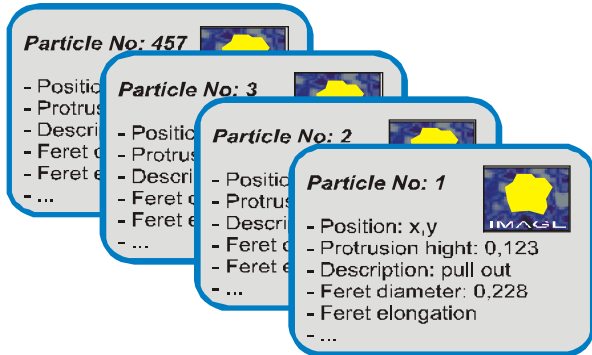
MEASUREMENT



High magnification to analyse all interesting parts from the segment.

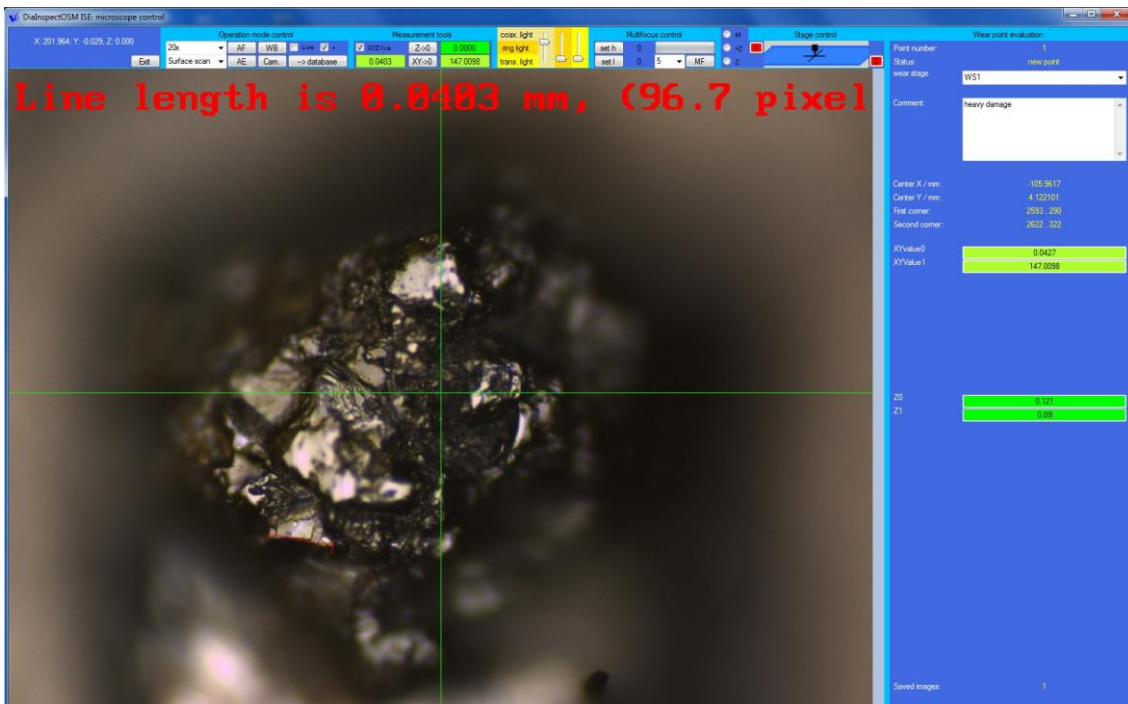
Step 3 **DATABASE**

Contents:













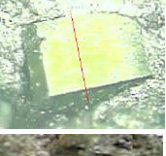







- x position
- y position
- height (z position)
- distance(Feret diameter, Feret elongation, ...)
- description (emerging, undamaged, microfractured, polished, damaged, pullout, ...)
- comment
- picture

Comfortable database to manage all segment analysis results.



In the database can be described all particles with their lifetime stage.

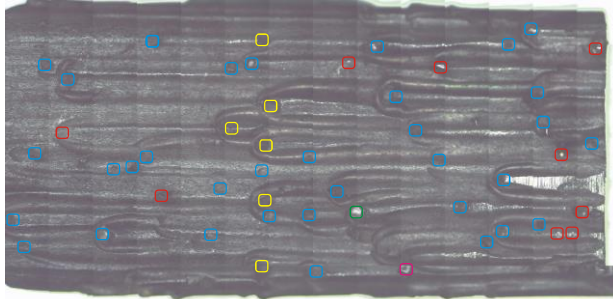
There are: emerging, undamaged, microfractured, polished, damaged and pull-out's.

description		description	mark
emerging			
undamaged			
microfractured			
polished			
damaged			
pullout			

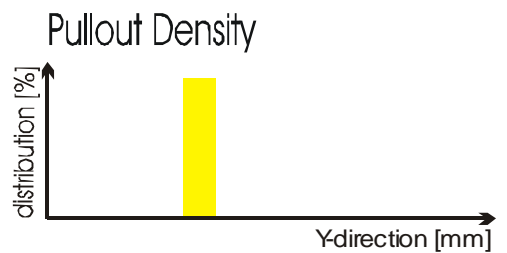
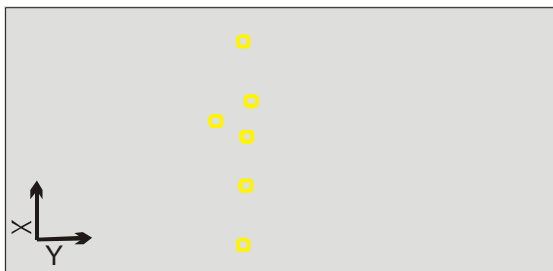
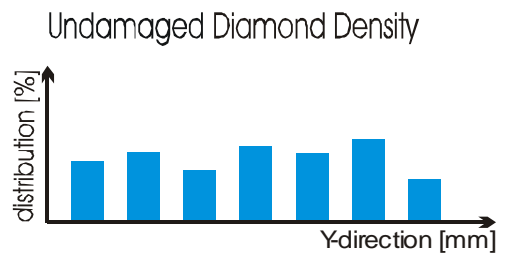
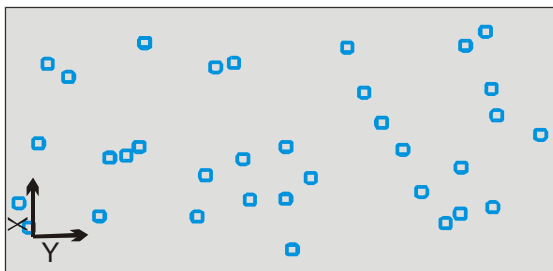
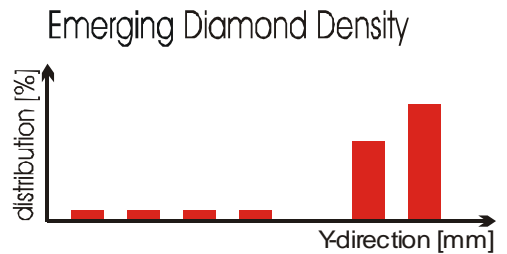
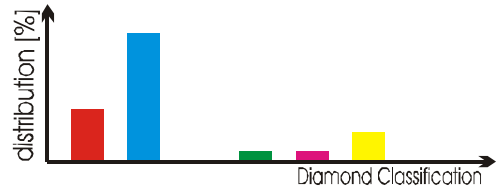
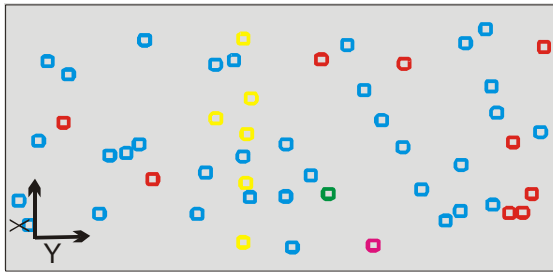
Step 4

Result

For an individual analysis, all data are transferred to an EXCEL array. So it easy to make a density distribution analysis.



Diamond Classification
Emerging
Undamaged
Microfractured
Polished
Damaged
Pullout
...



for example