Case Study

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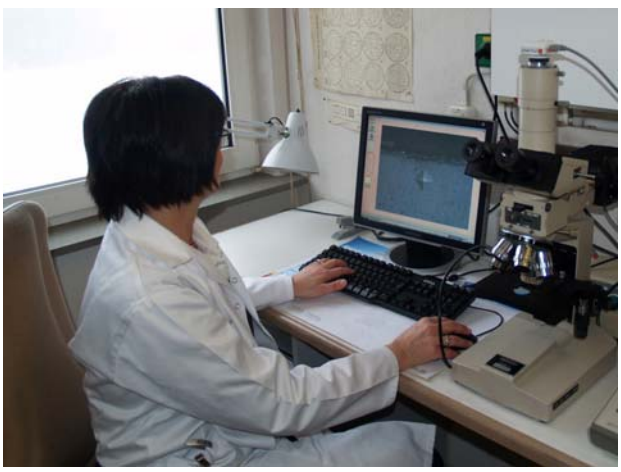
Quality assurance at microscope workplaces with the pixel-fox® imaging package

Leading international tool manufacturer, Gedore, uses the imaging solution pixel-fox® from software producer dhs Dietermann & Heuser Solution GmbH to test, evaluate and document the material and product quality of its tools (e.g. wrenches, screwdrivers, pliers, screw clamps, hammers, etc.) with the help of microscopes. The package from dhs is easy to use, saves time and produces perfect results.

The international manufacturer of tools and workshop equipment, *Gedore,* based in Remscheid (Germany) and employing roughly 3,000 people, makes a point of manufacturing most of its high-quality products at its own production facilities in Germany and Austria. Wrenches, screwdrivers, pliers, ratchets, tool trolleys, etc. are developed and manufactured with craftsman-like tradition but using innovative technology. Well thought-out-designs, high-quality steel and perfect implementation by experienced, skilled employees benefit customers and ensure the durability of the tools – since 1919! Going against the trend of buying in everything as cheaply as possible from low-wage countries, "Made in Germany" is still very popular with many customers. A good reason for *Gedore* to purchase **pixel-fox®**.

The background

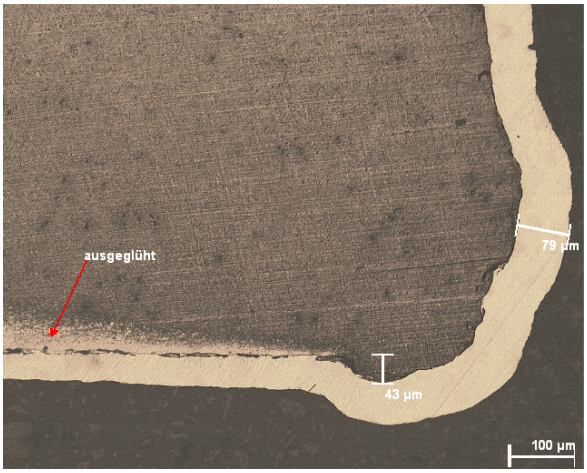
In the company's quality management unit metallographic tests are carried out to control the production process. Christiane Matic-Meester, who is responsible for these tests says: *"We prepare metallographic cross-sections of components from our production processes. These are used to optimise the products and for general quality assurance, but also to analyse damage and handle complaints."*



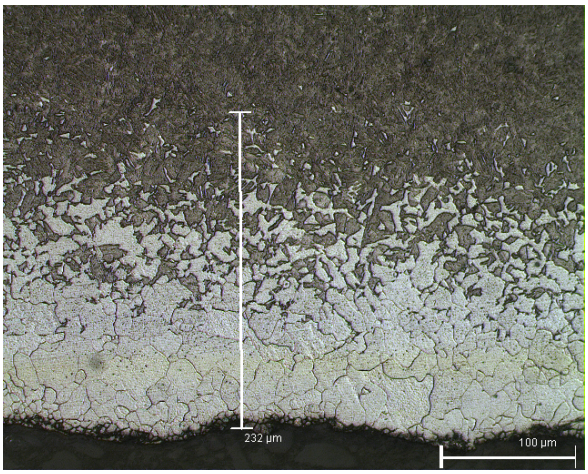
In the past, evaluating and documenting these cross-sections was very difficult and time consuming. *"Images were printed on a thermal printer several times, so that we had an image for every copy of the report"* explains Ms Matic-Meester. The measurement results were then handwritten on to the paper images and explanations were added. After this, the images were glued on to the reports and they were sent by post – as they were using hardcopy reports they had no other alternative.
"One of the main difficulties was that you could not always show the problem to be depicted or the important part of the image cleanly and in an optimal way. This was in addition to the high costs and the enormous amount of time that we needed to do all of this."

The task/problem solving

The way to resolve the problem was to find a solution that would not only save money and free up personnel, but, at the same time, would optimise the presentation of the cross-section image and enable faster communication. After examining various solutions in detail **pixel-fox®** came out on top – because this complete package not only contains a high-resolution digital microscope camera (which can be mounted easily on existing microscopes with a C-mount adapter), but also boasts very easy-to-use software to adjust the image parameters, for subsequent measuring and labelling and to save and document the images.
The unit, consisting of microscope, camera and software, is calibrated with the stage micrometer that also comes with the package. This is done just once for each optical magnification of the microscope; the calibration is then saved in the PC and simply allocated to the respective image in day-to-day practice. On this basis you need just one mouse click to integrate a scale bar in the image of the cross-section and everyone who reads the report gets an immediate idea of the proportions.



Measuring a chromium/nickel layer with reference to the annealed zone



Cross-section of a decarbonised zone on the outer edge of a work piece (mat. 31CrV3)

"For example, we use the extensive measurement possibilities (such as lines, radii, angles, areas, etc.) to measure surface layers, cracks, depths of hardening, diameters and inclusions" says the quality expert from *Gedore*. The solution also has functions such as crosshairs, labelling and live preview of the measured result. Structures are easily recognisable to document and explain the problem – even after the report has been printed. Unlike before, the report is now sent by eMail internally and externally within just a few seconds, with no loss of quality, and is available at any time to anyone.

The benefits

Software and hardware were installed in no time at all, basic system requirements facilitate easy implementation – as does the compatibility with all current Windows™ operating systems (Win 2000, XP and Vista). A standard USB2.0 interface is used to supply the power and quickly transfer the data from the camera to the PC. The image source can be mounted flexibly on existing optical equipment; besides microscopes, it is also possible to connect macroscopes, endoscopes, C-mount lenses, etc. The format-filling, extremely fast live image from the camera ensures ideal ergonomics for all users. Within just a few seconds images are adjusted correctly (exposure time, brightness, contrast, colour saturation, mirroring, white balance – much of this fully automatically), recorded, calibrated and saved.

The uncomplicated software design makes it very easy for users to familiarise themselves with the product and, if any questions arise, integrated online help is available with the F1 key or free eMail support. This is a great help to Christiane Matic-Meester and her colleagues: *"Archiving and distributing the test results in digital format is now quick and easy. Everyone can access the images and reports from their PC. This simplifies our everyday work enormously and we save paper and other expensive consumables."*

Many customers – now in more than 35 countries throughout the world – have realised this and have purchased **pixel-fox®** through one of more than 50 resellers. No problem, the software is available in German and English.

Summary

This imaging package – consisting of a digital microscope camera and innovative software for capturing, measuring and archiving images – is a modern aid for all laboratories and QA departments. It is based on the manufacturer's almost 20 years of experience with high-end systems (dhs Image Data Base). Easy to operate, flexible connection to existing equipment, highest standard quality, absolutely reliable operation and a surprisingly low price are the main features.

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