SYSFO

SYSTEMFORSCHUNG M.KÄMMERER

WE INTEGRATE INNOVATIVE SOFTWARE TECHNOLOGIES AND
METHODS OF MACHINE INTELLIGENCE INTO YOUR PRODUCTION

COMPUTER-VISION SYSTEM FOR
CRACK INSPECTION MAGNETIC PARTICLE TESTING
FULLY AUTOMATIC 100% SURFACE INSPECTION WITH FLUX CHECK

Systemforschung a specialist in the field of optical pattern recognition has developed an all in one crack detection system including automatic powder entry, automatic image acquisition, illumination, innovative pattern algorithms, good/bad classification, system monitoring, documentation. It can be tailored to customer specific requirements.

The image processing can be done on objects in motion. The inspection criteria can be parameterised in accordance with customer's requirements. The process monitored evaluation ensures consistent reproducible inspection quality and is fully documented.

The recognition software of the PC based inspection system identifies and measures all kinds of linear displays which are in contrast to the environmental background by shape and intensity. To do this the software evaluates both the intensity and the geometrical shape of the displays.

The algorithms recognize cracks regardless of direction, curvature and branching and eliminates pseudo errors (artefacts)
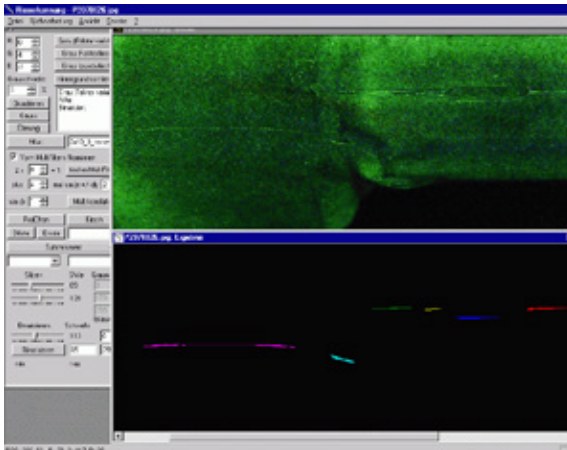
- Cracks with intermittent displays are classified as being continuous.

- Local irregularities of the magnetizing and powder entry are automatically recognized and compensated.

- Each display will be classified and measured with respect to length, width, intensity, direction position and contour.

- The inspection does not need a darkened test chamber.

Industrial image processing is superior to manual inspection because of the low system break down rate, real time inspection and because of health benefits for the company personnel. For this reason a growing number of companies are using Computer-Vision Systems.
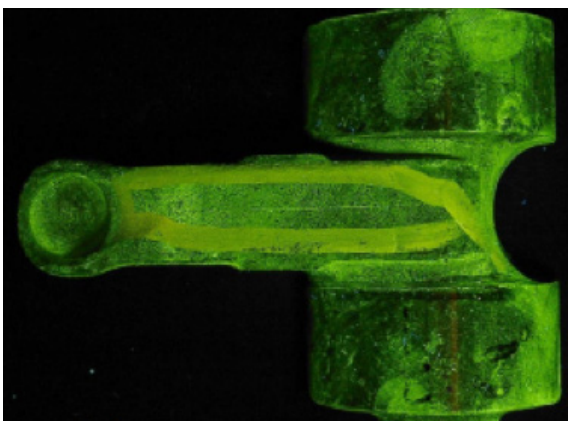
SOLUTIONS
AUTOMATIC INSPECTION ON PLAIN SURFACES

Forging blanks of a drive shaft

The display to the right shows a drive shaft of a truck. The automatic evaluation in the lower display show the recognized linear displays. Each crack identified as being continuous with intermittent displays appears in a different colour.

Customer specific evaluation criteria classify these objects according to size, direction, location, density of faults and display intensity.

AUTOMATIC INSPECTION ON COMPLICATED SURFACES

For a variety of highly stressed workpieces an automatic inspection is more than sensible.
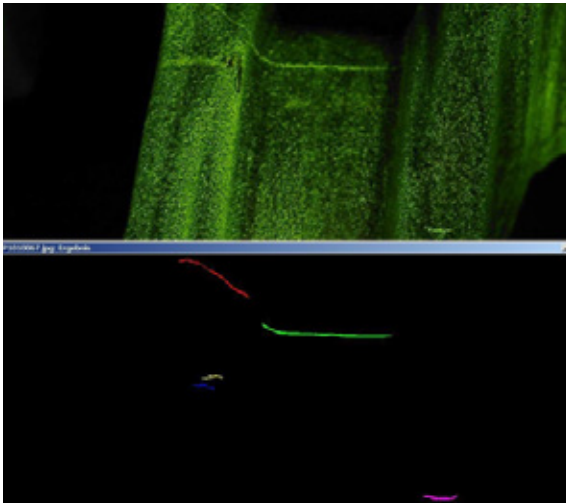The picture shows some examples.
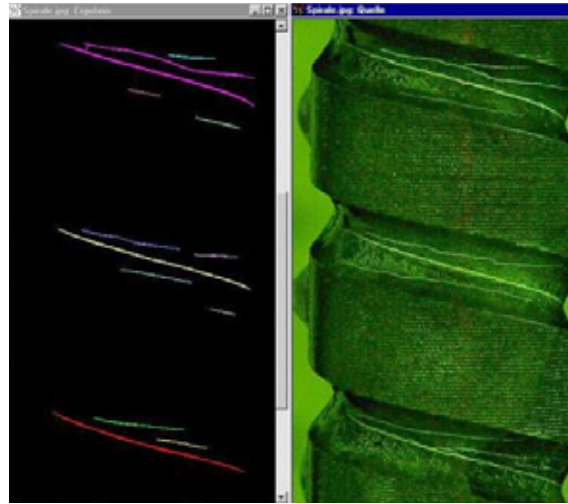

common rail   *crank shaft*   *turbine blade*

In the production line the inspection system must be ruggedized with respect to vibrations dust, fluctuations of the luminosity and magnetizability of the test powder.

# SOLUTIONS FOR VARIOUS CRACKS ON FORGED PRODUCTS

cracks on a forged crank shaft

cracks on a spherical shaft

AUTOMATIC BILLET SURFACE INSPECTION

By using innovative image processing methods longitudinal, diagonal and edge cracks on the surface of billets are reliable detected and documented thus being the basis for a computer controlled optimization system and a manual or fully automatic elimination of surface faults. Longitudinal cracks with a depth between 0,2mm and 0,35mm and a length of ≥ 5mm are detected at a rate of 100%.
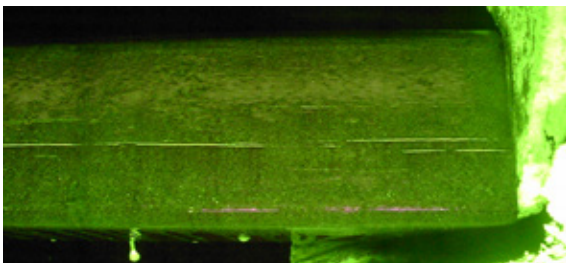
Ultra short flashes enable stung sharp images during the real time operation of the whole system. Vibrations and background light don't influence the imaging process.

The software visualizes each identified crack according to a pre adjusted minimum length. Artefacts are sorted out as well as clamps etc.

INTEGRATION INTO EXISTING PRODUCTION LINE

Pattern recognition is ideally suited for integration in a fully automated test Equipment.

We are your partner for planning, develop and build your system to exactly meet your requirements.
We supply complete inspection systems with state-of-the-art technology .

By connecting the system to an in-house product data base each test item will be evaluated according to individual test criteria. With the stored results a back tracing and statistical evaluations are possible.

Features

- High and reproducible recognition rate, few pseudo images
- Complete documentation of test results including images
- Inspection of moving test specimens
- Simple adaption of test programs to customer specific criteria
- Constant monitoring of all system components
- Industry proven and able to be integrated into existing production lines