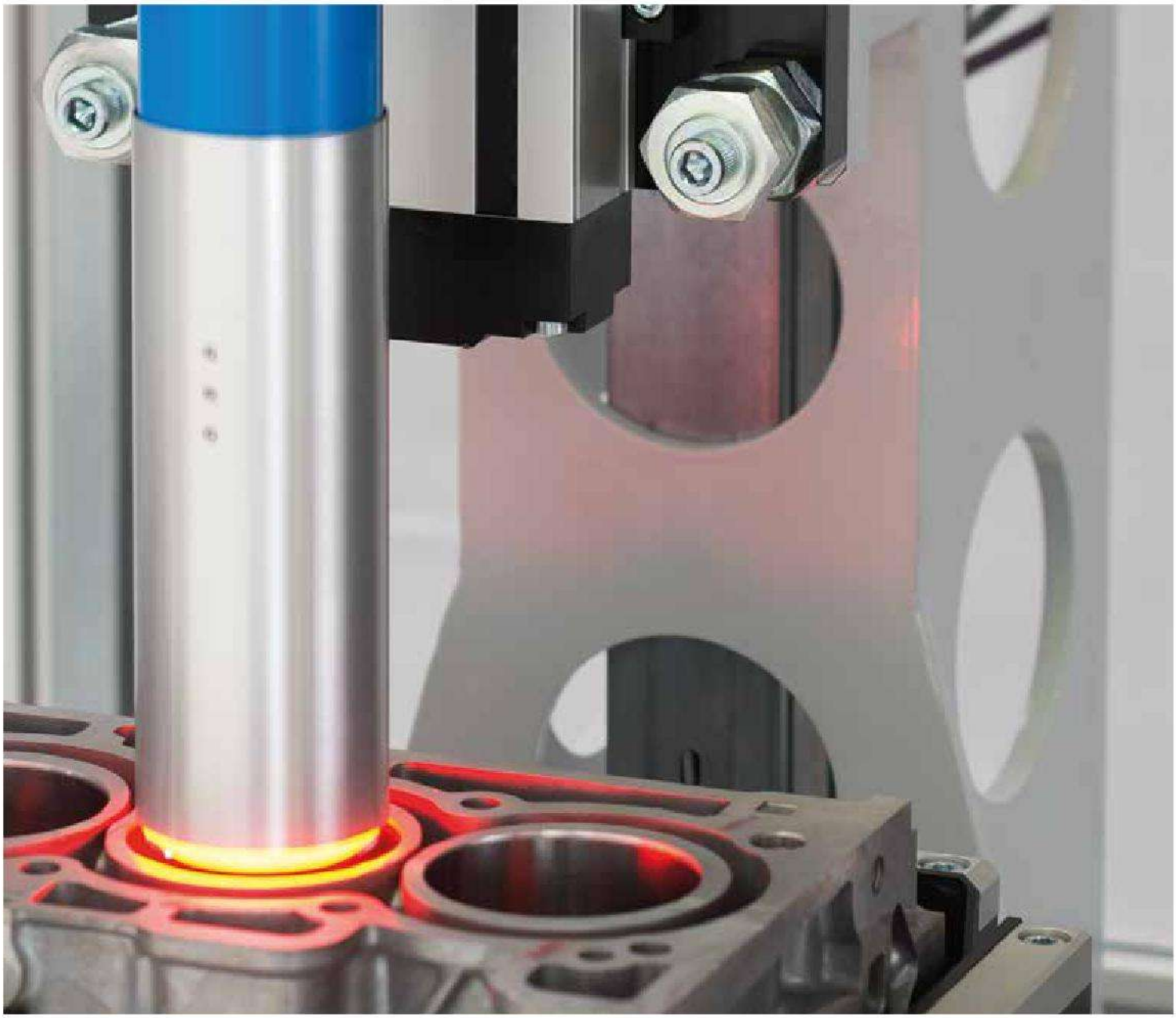
Visionline – Optical surface inspection & profile measurement

Reliable and automated
testing of technical surfaces



HOMMEL ETAMIC

A member of the JENOPTIK Group

www.hommel-etamic.com

Precise metrology for efficient quality control

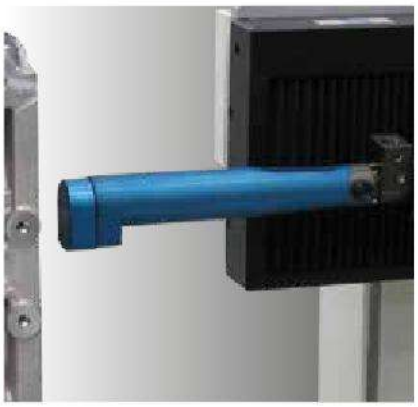
As a leading manufacturer of metrology systems, HOMMEL-ETAMIC offers a broad portfolio of measurement solutions for industrial manufacturing processes. Our technologies include pneumatic measurement, tactile or optical measurement of roughness, contour, form and dimensional features, as well as optical inspection of machined surfaces.

Comprehensive services such as consulting, training, DAkks-DKD calibration and service, including long-term maintenance contracts, round off our worldwide range of metrology services for quality assurance in industrial manufacturing.

Our measuring systems ensure the quality of the workpiece throughout the entire production process and provide precise measurement data in the shortest possible time. Automatic measuring technologies enhance overall productivity during production through efficiently designed inspection solutions – whether inline or offline, or using spot checks through 100 % inspection of all manufactured workpieces.

Inspecting inside bores

Inspecting plane surfaces



Measuring micro structures

Our Visionline solutions provide you with a wide range of application options for optical surface inspection and profile measurement. The systems can be integrated into automated production processes, and deliver reproducible, robust results.

Surface inspection

- Cavities
- Pores
- Scratches
- Recesses
- Spalling
- Burrs

Profile measurement in cylinder bores

- Groove width
- Groove base width
- Micro structures

Please scan for detailed Visionline information

Innovative, optical inspection of various surfaces

Reliable test results

With Visionline solutions, the inspection process is automated and delivers operator-independent and reproducible results. This avoids the errors of visual inspection and ensures that only really high quality products are processed and delivered.

Optimized processes

The immediate inspection of all workpieces directly after the processing step allows statements about the manufacturing quality. The feedback of the test results into the production process helps to identify and remedy problems at an early stage.

High quality products

For an optimized quality assurance process, the test results are clearly documented and made available to the production line for further processing. Detailed displays make any defects visible and allow for immediate rectification. This increases the product quality and thus the satisfaction of your customers.

Reduced inspection costs

Automated 100-percent inspection of technical surfaces saves you time and money. To speed up your inspection process, Visionline systems inspect surfaces in the shortest possible time and deliver objective results without operator influence.

Optical surface inspection in bores

Advantages of optical inspection

- Wear-free and reliable thanks to optical testing technology
- Fast inspection with short measuring cycles
- No retooling of the systems when changing workpieces
- Safety in case of misalignment of the workpiece thanks to collision protection
- 100-percent control
- No operator influence
- Reduction of pseudo-errors and unrecognized defects (slippage)

Visionline B5. Optical inspection systems for reliably detecting defects in bores from 5 mm

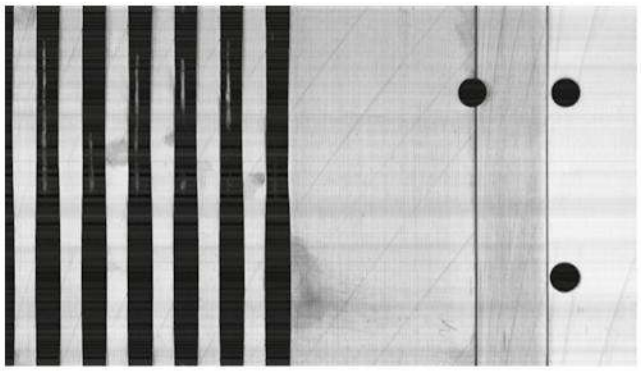
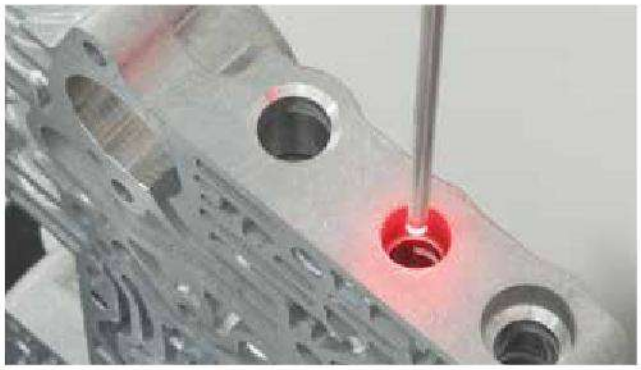
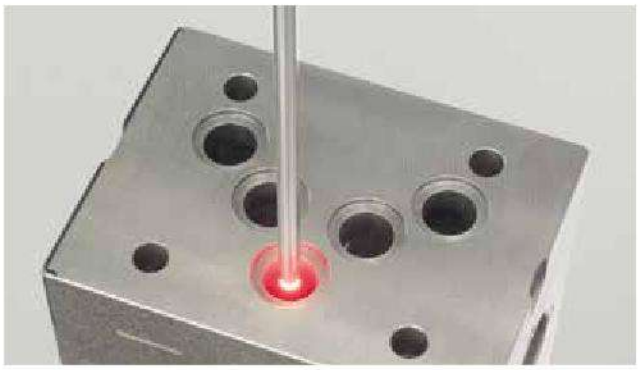


Illustration of a bore inside surface



Valve control plate bore inspection



Inspection of bore surfaces in a mobile hydraulics block

The B5 internal inspection sensor scans the entire surface of a bore. The sensor delivers high-resolution and distortion-free images of the surface in order to reliably detect small defects.

System features

- Automatically inspects interior surfaces within bores using a wear-free and reliable 360° lens
- Objective test results without influence of the worker
- Detects common surface defects such as cavities, pores, scratches, etc.
- Image pickup whilst in motion and within the required cycle time
- Diameter range 5 – 14 mm

Modular system concept

- Offline with manual loading
- In-line with automated workpiece handling
- Flexible robot system
- Multiple sensors as well as combination with other sensors (e.g. F200S) in one system is possible

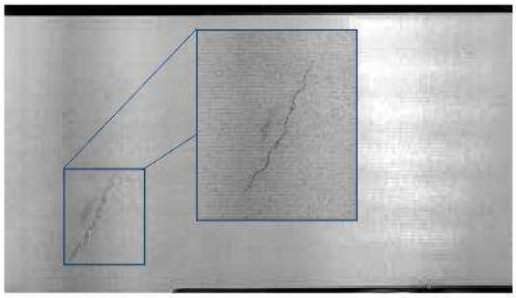
Application examples

- Valve control plates
- Control slide bores
- Injection pump housings
- Hydraulic valve housings
- Cylinder head (injector bore)

Visionline B20. Internal inspection sensor for optical surface inspection of bores from 14 mm

The B20 inspection sensor enables precise inspection of bore surfaces. Even the tiniest imperfections are detected reliably and within the required cycle time.

Visionline B20 inspection station



Crack detected on cylinder surface

System features

- Utilizes the latest CMOS image sensor technology and a 360° lens for reliable and automated inspection
- Robust detection of common surface defects such as cavities, pores, scratches, etc.
- Head-on collision protection to avoid damage in case of workpiece misalignment
- High acquisition rate for shortest inspection times
- Diameter range 14 – 50 mm, therefore no conversion necessary when changing workpieces

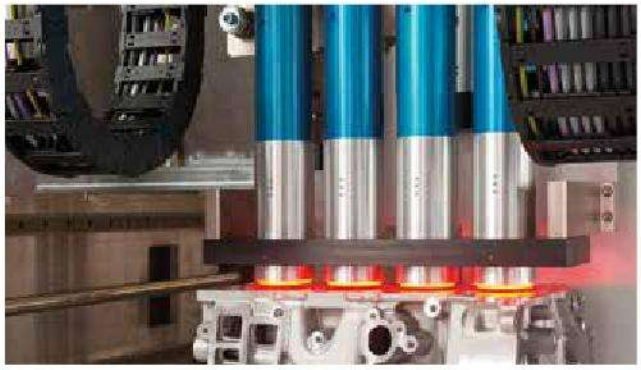
Modular system concept

- Offline with manual loading
- In-line with automated workpiece handling
- Flexible robot system
- Multiple sensors as well as combination with other sensors (e.g. F200S) in one system is possible

Application examples

- Brake master cylinders and brake disks
- Pump housings
- Con rods
- Injection pump housings
- Hydraulic/pneumatic valve housings

Visionline B100. Optical surface inspection sensors for cylinder bores from 68 mm



Simultaneous inspection in four cylinder bores using four B100 sensors

Robot-guided inspection cell

Inspection station with manual loading

Above-conveyor system for inline engines

The B100 internal inspection sensor automatically scans the entire inner surface of cylinder bores and delivers high-resolution images of surface defects in the fast production cycle.

System features

- Automatically inspects the inner surfaces of bores using a 360° all-round lens
- Detects common surface defects
- Easy integration into the manufacturing process for 100-percent inspection
- Process-reliable differentiation of defects and residual dirt from drying
- Diameter range 68 – 110 mm

Modular system concept

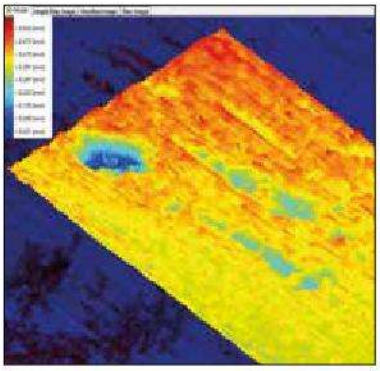
- Offline with manual loading
- In-line with automated workpiece handling
- Flexible robot system
- Multiple sensors as well as combination with other sensors (e.g. F400S) in one system is possible

Application examples

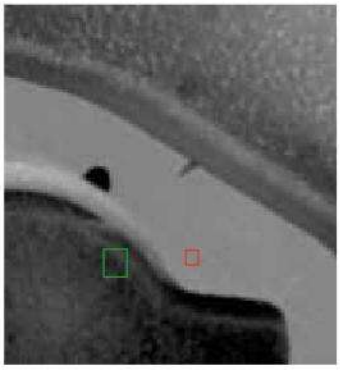
- Crank cases
- Cylinder liners
- High-pressure housings
- HGV con rods
- Steering boxes

Visionline F200S & F400S. Optical inspection systems for automatic inspection of plane surfaces

Plane surface inspection using the F200S

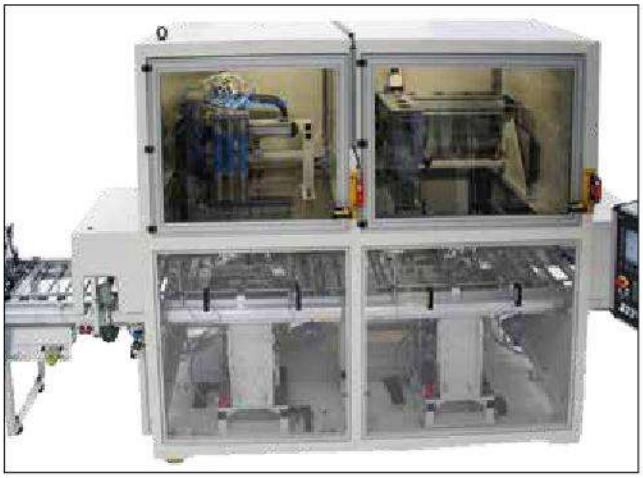


Evaluation of surface defects



Red: edge flaw, green: contamination

Offline inspection station



Full inspection of cylinder bore and plane surface on the engine block

As a result of their fast speed, the F200S & F400S systems are used for full inspections of plane surfaces. Innovative camera and lighting technology and adaptive, dynamic masking are used to distinguish between genuine surface defects and contamination with a high level of process reliability.

System features

- Automatically inspects plane faces
- Detects common surface defects such as cavities, pores, scratches, etc.
- Image pickup whilst in motion and within the required cycle time (fly-over technology)
- Short inspection times thanks to a fast scan rate
- Adaptive, dynamic masking for reliable edge inspection
- Powerful 3D technology
- Offers a complete solution for full inspection of e.g. crank cases in conjunction with bore inspection
- Scan width 200 or 400 mm, depending on model

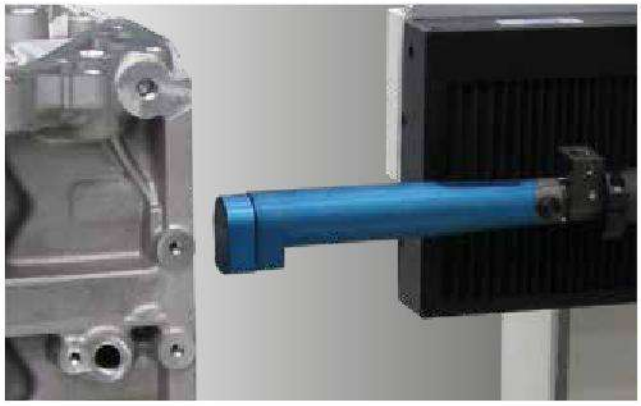
Modular system concept

- Offline with manual loading
- In-line with automated workpiece handling
- Multiple sensors as well as combination with other sensors (e.g. B100) in one system is possible

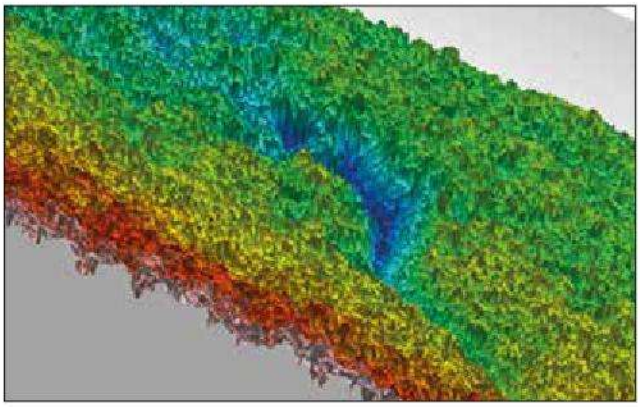
Application examples

- Crank cases
- Cylinder heads
- Valve plates
- Rough cast liners

Visionline CF650. Optical measuring systems for determining micro structures



Measuring micro structures



3D topography measurement

Thanks to chromatic-confocal point sensors, the optical measurement systems CF650 deliver high-precision surface measurement in cylinder bores.

System features

- Automatically measures micro structures in cylinder bores
- Can be integrated into fully automated systems
- Possible to carry out 3D topography measurements

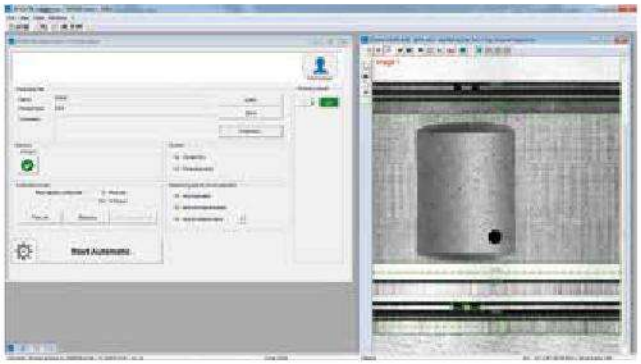
Modular system concept

- Offline with manual loading
- In-line with automated workpiece handling
- Multiple sensors as well as combination with other sensors (e.g. B100) in one system is possible

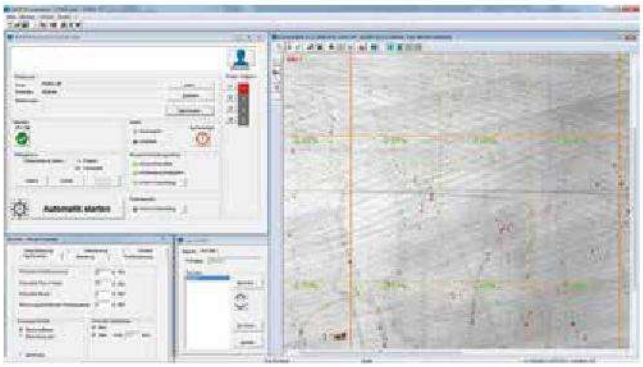
Overall view of the CF650 measuring system

Evovis Vision. Software with clear user guidance for reliable inspection results

The graphical, function-oriented user interface of the Evovis Vision inspection and analysis software guarantees that you can operate the systems for bores or plane surfaces simply and accurately. Numerous functions and wizards simplify the use of the software. It takes just a few simple steps to tailor the inspection system to a specific workpiece. This means that Evovis Vision ensures full quality control of each workpiece in accordance with the specified cycle time of the production line.

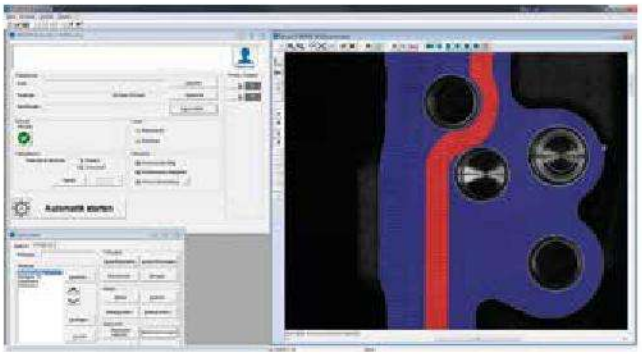


Defining inspection criteria and inspection zones



Automatic surface analysis

Statistical analysis using qs-STAT®



Adaptive, dynamic masking

System features

- Clear user interface and easy-to-understand icons
- Numerous wizards make it easy to create inspection plans
- Full evaluation and analysis functions for full quality control of manufactured parts
- Can be used for semi-automatic or fully automatic systems
- Interface to the line control system for integration in the production process control system
- Records and evaluates surface defects such as pores, scratches, cavities, etc.
- Evaluates regular and irregular structures
- Dimensions of cross bores and chamfers
- Determines relevant inspection zones with individual classification
- Measures surfaces in the image plane, e.g. edges or bore diameters
- Clearly documented results and detailed representations
- Robust detection of defects through adaptive, dynamic masking

HOMMEL ETAMIC

Worldwide availability

Our expert teams are available to assist you wherever you are located. We have subsidiaries and distribution partners in key national nations, in order to assist our customers as a reliable production partner.

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