



## Surface inspection system for cylinder bores

Measurement and assessment of surface features as

- Crosshatch-angles
- Dimension of surface structure
- Area of blowholes
- Stroke reversal radius
- Roughness

of cylinder bores in development, research and production areas



### TOPOMETER

Quick and accurate inspection of cylinder bore surfaces directly on the production floor. Visual inspection of surface features and contact inspection of surface finish are uniquely combined in one compact measuring probe.

### Highly flexible

The TOPOMETER TM 111 inspection unit is available in two versions. A base model serving solely as a visual inspection unit, and an extended model combined with roughness measuring capabilities. Visual kits can be upgraded or retrofit to full feature models. The probes are available in operating length of 150 mm and can be used in bores all the way down to 60mm in diameter. Different bore diameters are adapted by simply exchanging the locators used for radial pivoting and centering of the probe.

### Easy handling

The entire system control is centrally located in the compact industrial PC with extension boards for live video display, image processing and the roughness testing unit. The systems software menus are clearly structured and guide the operator through the individual steps of operation. The software is operated using the keyboard function keys,

the mouse or the track ball. In addition, the functions needed most frequently during operation, such as motorized axial positioning, motorized zoom and focus adjustment and illumination adjustment are ergonomically located directly on the probe itself or can be adjusted by using the keyboard. Within seconds of inserting the high resolution optical probe in the cylinder bore, the inspector sees a magnified image of the surface on the PC system.

### Complete bore assessment

The system enables the complete assessment of the inspected cylinder bore. This complete assessment includes fast axial scanning, a full range of possible visual measurements at any location within the bore and the capability to evaluate these areas within the bore in terms of all standard DIN and ISO roughness parameters. The individual, adjustable light sources enable optimum illumination of any particular bore surface to be measured.

### Wide range of functions

The user-friendly menus allow the inspector to quickly measure the cross-hatch pattern, including angles in degrees, grooves width or other dimensions in inch or metric, areas of defects and stroke reversal radius. An easy-to-use control panel lets the inspector select the measuring mode and complete the measuring in a matter of seconds. The data is displayed on the screen in the desired unit.

### High sampling rates

For rapid angular check, a tolerance mode overlays a "reference" angle in the middle of the screen with angular limits set to correspond with the specified tolerances selected. The operator positions the tolerance image over the cross-hatch angle to be checked and visually verifies the fit.

### Documentation guaranteed

The optical video printer supplies immediate hard copy photographic documentation of the image and data on the video screen. A laser-printer can be connected for numerical and graphical printouts of the roughness parameters and profiles. Optical discs are available for video image storing and archiving.

### Mobile use

Due to the compact design and the low weight of the probe of the measuring system can be comfortably moved to different locations throughout the plant floor.

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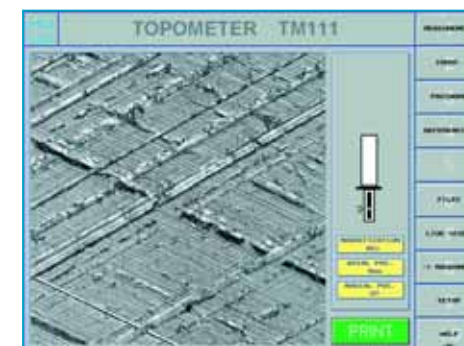
The ideal inspection unit for quick and accurate inspection of cylinder bores directly in production areas.



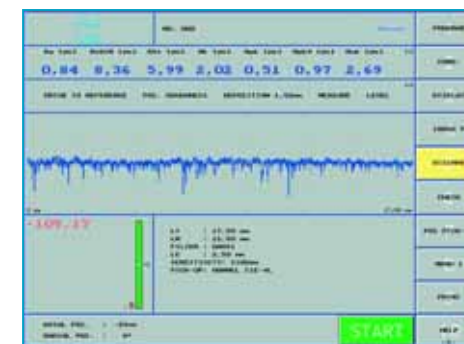
Evaluation of the cross-hatch angles



Industrial housing for use in production environments



Display of a bore surface



Display of roughness profiles

