

F-Camera mini

Inline inspection of surface cleanliness and coatings

High resolution, fast and robust

With its compact design and high frame rates, the F-Camera mini can be integrated into the production line.

In production of highly integrated components such as circuit boards, even slightest contaminations of contact surfaces can cause severe problems. High-precision inspection of surface cleanliness and coatings is therefore crucial to ensure component quality. Integrated into production equipment, the F-Camera mini inspects surfaces with a resolution in the micrometer range.

Suitable for a wide range of surfaces

The F-Camera mini enables very sensitive imaging inspection of entire component surfaces. The inspection system detects impurities or the quality of coatings within seconds at a resolution in the micrometer range. Using fluorescence measurement technology, it reveals organic substances on surfaces with high sensitivity. The F-Camera mini reliably identifies filmic contaminations down to a thickness in the 10 nm range.

Quantitative measurements

Fluorescence is excited by an illumination unit consisting of several high-power UV-LEDs. When exposed to the UV light, organic

substances such as filmic contaminants and coatings will emit light in the visible spectral range. By suppressing the excitation light, the coating or contamination on the surfaces become visible. The intensity of the fluorescence signal is proportional to the thickness of the detected layer, which allows the quantification of the data.. Downstream image analysis allows for further evaluation of the surface quality for quality assurance purposes.

Measurement results within a second

The field of view and image resolution of the F-Camera mini can be adapted to the specific task. For instance, an area of 18 mm × 14 mm (2.5 cm²) with a resolution of 20 µm can be captured in a single exposure, allowing for the

Advantages

- Cleanliness inspection at typical processing speeds
- Quantitative inspection of coatings
- Inspection with micrometer resolution
- Suitable for integration into production equipment
- Suitable for harsh environments

detection of confined filmic contamination with high reliability. Contact pads of electronic circuit boards, for example, can be inspected for flux residues or adhesive surfaces for residues of oil and grease.

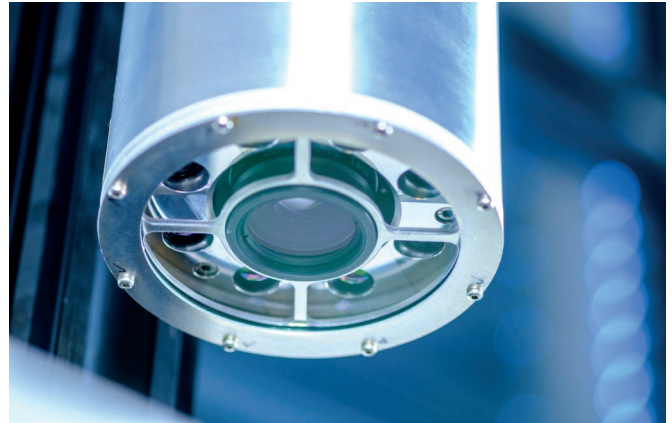
A high frame rate of up to 20 Hz enables process-integrated quality control of component surfaces. The measurement results are available within one second. This allows defective components to be identified within the production cycle and appropriate measures to be taken.

Especially areas with particularly stringent requirements for cleanliness can be inspected in line with high accuracy. This includes segments dedicated to joining and bonding processes or areas where electrical insulation is required.

Compact and robust

The F-Camera mini is characterized by its compact design, which allows integration of the measuring head into the production equipment. Thanks to very short exposure times of typically just a few milliseconds, it is also possible to inspect parts in motion or strip metal processing at speeds of up to 1 m/s. By stitching the individual images, seamless inspection in the direction of the strip is possible.

The optical components of the F-Camera mini are encapsulated in a robust housing, which can be enclosed by an additional air-chilled casing if required. This allows the system to be operated in harsh environmental conditions, e.g. high temperatures or atmospheres with oil or solvent vapors as commonly found in metal and wood processing.



Camera (center) and illumination (ring-shaped outside) are housed in a robust, cylindrical housing. The entire measuring head is 20 cm high and 12 cm in diameter.



Fluorescing flux residues on a printed circuit board detected through an imaging process.

Technical data

Image area	18 × 14 mm ²
Pixel resolution	9 µm
Excitation wavelength	365 nm
Detection wavelengths	> 420 nm
Frame rate	20 Hz
Exposure time	typ. 1–5 ms
Dimensions	height: 200 mm, diameter: 120 mm

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