



Intego
Vision Systeme

Automated Inspection of Laser Labeling Systems

Area of Application

During the production of items designed for day and night use, labeling lasers assist in applying layers of lacquer to the three dimensionally formed surfaces of buttons and other control elements.



Items designed for day and night use are made from painted plastic pieces with the help of labeling lasers. The labeling quality must be inspected.

Due to the high quality demands of the consumer, especially in the automobile industry, the finished products must be thoroughly inspected for design faults. Today, this quality control process is mainly a manual procedure.

The TOPAS test system from Intego GmbH offers automatic testing of the following fault categories:

- **Variations in the exact positioning of pieces in the laser labeling unit**
Through positioning measurements and readjustment of the laser, faulty positioning of the piece during labeling is avoided, and the resulting yield is increased.
- **Labeling defects resulting from the laser process**
Typical production faults, such as non-uniform line thickness, incomplete symbols, or permeability variations are detected.
- **Surface faults in the finish**
Detection of lacquer faults, such as inclusions, bubbles, or scratches.

Any detected fault results in the generation of a control signal, used to single out the faulty test

piece. Additionally, a statistical summary of detected faults provides information useful for the optimization of the production system.

Preconditions for deployment

Automatic quality control testing of laser labeling is suitable for continuous production of high lot numbers. The acquisition of a test system is most practical when directly integrated into a newly purchased labeling system; however, the test system can also be retrofitted to existing labeling systems.

Testing takes place fully within (and without any increase to) the cycle time of the labeling system.

Introductory Options

Free Assessment

At short notice and without cost or obligation, sample pieces sent to Intego GmbH will be examined by the test system and sample evaluations will be generated. These evaluations can be used to determine the potential efficiency enhancement of your specific application.

Support

Intego GmbH will be available for support at any time, should future questions arise pertaining to the adaptation of the test system to new products or new fault types.

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Automated Inspection of Laser Labeling Systems

Technical Data

Test System Components

The optical inspection system consists of an imaging module and an evaluation module.

The imaging module contains optical probes with associated lighting equipment and is available in two versions: structurally integrated into the laser labeling system or as a stand-alone version incorporating its own linear handling unit.

The evaluation module consists of a computer cabinet with both user and machine interfaces. It is used to adjust system parameters and monitor test results, as well as to sense external control signals.

The optical probes incorporated in the imaging module compensate for any variations in ambient lighting. As a result, no restrictions need to be placed on room lighting.

Test Sequence

The test apparatus can be integrated into the laser labeling system. In this case the test pieces are brought to the test position and evaluated within the framework of the laser labeling process.

During operation, the monitor displays the current test status and the image of the part being processed.

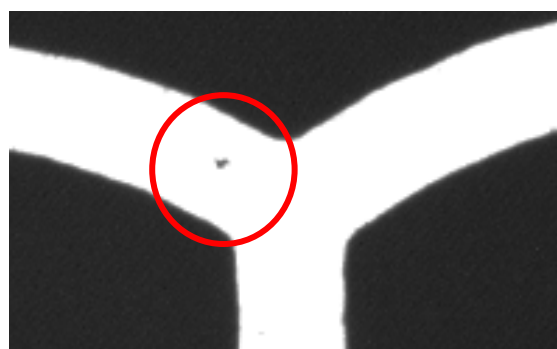
Upon completion of the test, the test results are displayed and forwarded over the control port to allow for the external rejection of defective pieces.

The test takes place within the operating cycle of the labeling system, without any decrease in throughput.

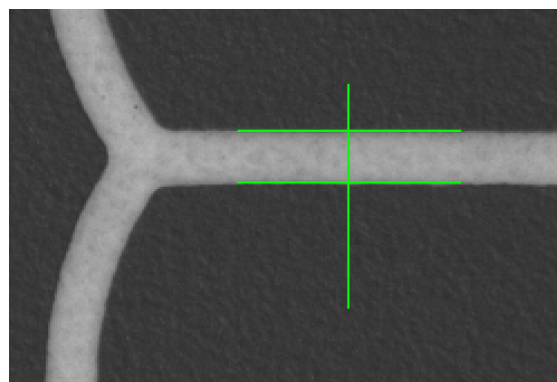
To allow for the constant optimization of the production process, statistical summaries and overviews of the various faults can be viewed at any time, even during operation. The time span to be reviewed can be freely selected, as desired.

Typical Fault Types Detected through Optical Inspection

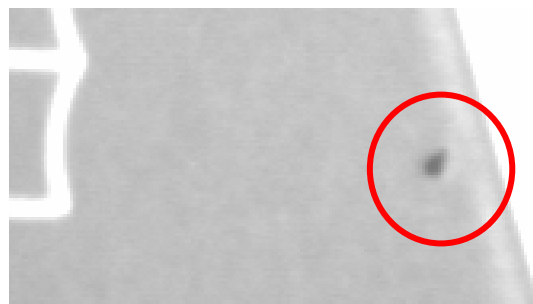
The following figures display several typical fault types, which the TOPAS test system can detect automatically.



Fault in the symbol



Measurement of stroke thickness



Surface fault

Immediate automatic fault recognition saves not only on the cost of testing, but also serves to decrease fault rates, since fault sources are immediately detected and reported, allowing for immediate shut down to rectify the fault source.