![Mühlbauer High Tech International logo]

SHEET INSPECT SPOT CHECK

SEMI-AUTOMATIC SYSTEM FOR SECURITY PRINTING

SHEET INSPECT

SEARCH FOR DEFECTS

DEFECT-FREE SHEET

DEFECTIVE SHEET

DEFECTIVE AREAS

Register: print to sheet	1
Register: front to back	2
Register: print to print	3
Color	4
Total color measurement	5
Notch	6
Watermark	7
Substrate	8
Print	9
Special print	10
Thread	11
Foil	12
IR print	13
UV print	14
Magnetic print	15

SHEET INSPECT SPOT CHECK

SHEET INSPECT Spot Check has been designed to inspect the print quality of single decorated/printed sheets. It can be used for a variety of designs and substrates, e.g. metal, paper, plastic and hybrid materials. Its vision technology is based on Mühlbauer's proven high volume inspection solution SHEET INSPECT.

SHEET INSPECT Spot Check is a standalone inspection unit with sheets fed-in manually. The sheets are positioned fix and absolutely flat. SHEET INSPECT Spot Check is best suitable for spot checks and for high accuracy print inspection of single sheets with regard to special defect characteristics.
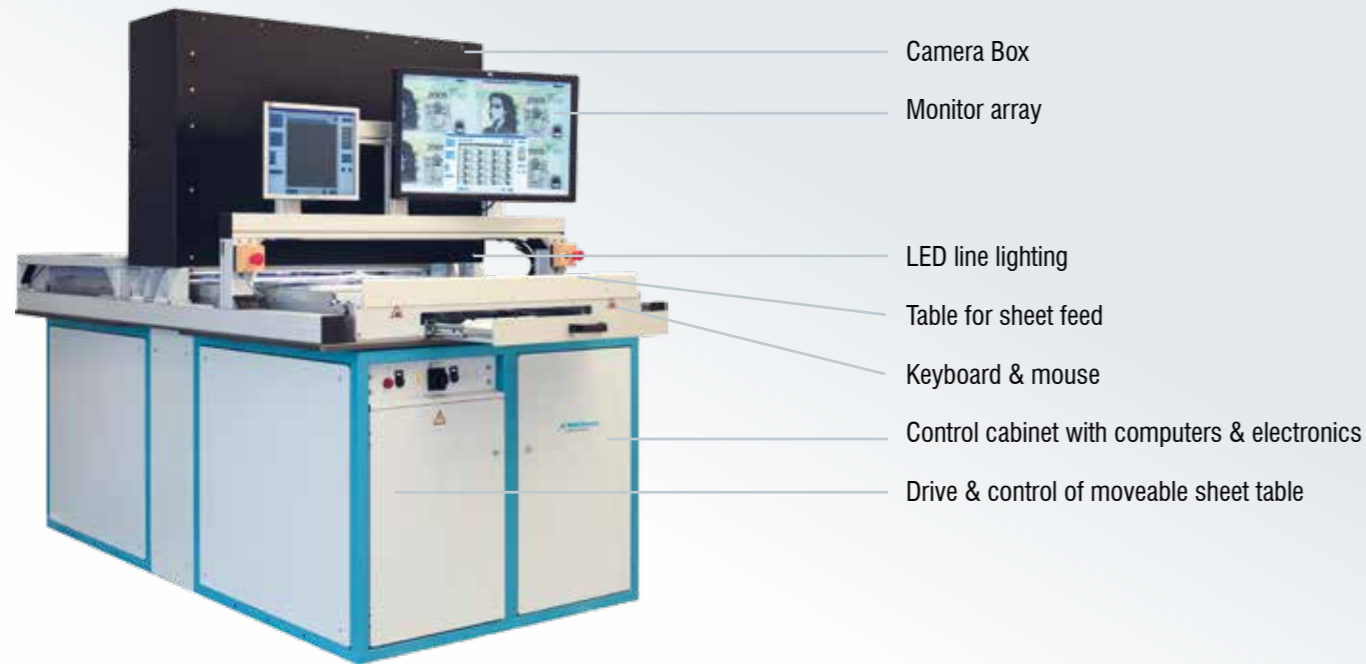

ADVANTAGES

- Suitable for a variety of substrates, e.g. metal, paper, plastic, hybrid
- Suitable for special applications such as printed electronics
- Modular design — customizable
- Little floor space required
- Designed for an inspection width of approx. 1000 mm
- White light, UV light and IR light available
- Transmissive inspection can be included
- High resolution in both cross direction and transport direction
- Freely adjustable inspection areas with individual tolerances
- Wizard supported easy system setting, straightforward user interface
- Monitor display covering the whole inspection width — local determination of the defect on the sheet

SHEET INSPECT SPOT CHECK

DESIGN

- Camera Box
- Monitor array
- LED line lighting
- Table for sheet feed
- Keyboard & mouse
- Control cabinet with computers & electronics
- Drive & control of moveable sheet table

CAMERA BOX

The camera are encapsulated to protect them against environmental influences. The camera box can easily be opened to do checks and hardware adjustments, if required.

Camera box opened

SHEET INSPECT SPOT CHECK

WORKING PRINCIPLE

CAMERAS

SHEET INSPECT Spot Check works with color line-scan cameras. For getting a complete image the inspection object must be in motion, e.g. move forward or backward to let the camera scan the object line by line. A rotary encoder constantly provides information on the speed of this movement to the vision system which creates a complete picture from the camera data.
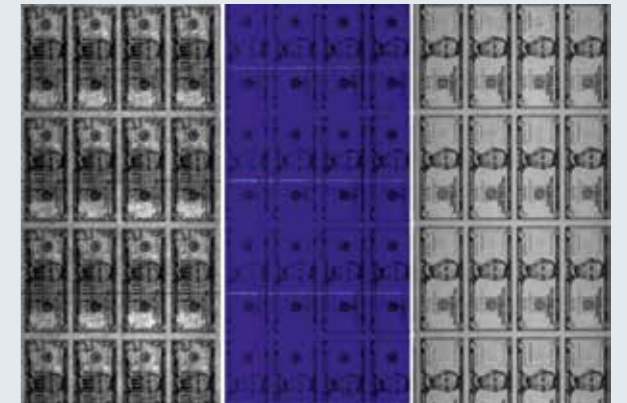
SHEET INSPECT Spot Check is usually equipped with 3 cameras to cover the whole width of the sheet. Every camera scans a portion of approx. 1/3 of the total width plus a small column of overlapping. This camera array enables high inspection accuracy. The construction principle is modular. Image reslolution depends on the camera type, the material width and the number of cameras used.

CAMERAS

SHEET INSPECT Spot Check can be equipped with a partitioned lighting unit which includes white light, IR light and UV light. Each portion covers one third of the total lighting width. The LED light source is long-life, super-bright and steady. The illumination covers the whole width of the sheet.

SHEET INSPECT Spot Check is designed for an inspection width of approx. 1000 mm.

SHEET INSPECT Spot Check can be equipped with incident lighting and transmitted lighting.

LIGHTING

The sheet feed table (transparent for transmitted light inspections) is driven by an electric drive and serves to move the sheets for the camera scan. For that purpose the sheet is placed on the table. After pressing the start button the table moves forward, stops and then move back again. Both movements can be used for the scan process.
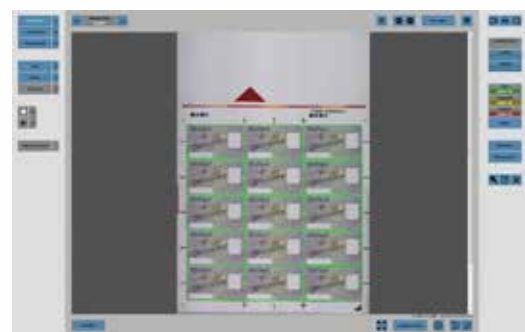
COMPUTER AND VISION SOFTWARE

Below the sheet feed table is the control cabinet which contains all vision computers, the master computer, electronics, wiring, UPS, climate control, etc.
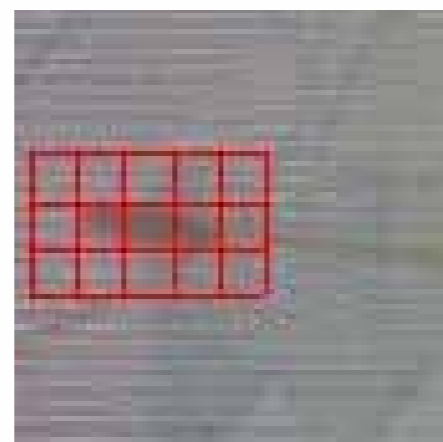
Typical defects are color deviations, color voids, stains and blobs, out of register, as well as presence and integrity of security features. Inspection zones with individual inspection tolerances can be set automatically or manually; they can be determined as rectangles, circles, or polygons easily by mouse. The image zoom enables the operator to see and scrutinize parts of the print anytime in great detail. A wizard leads the operator through the set-up process.

The inspection field is divided into sections and these sections are further split down to zones. Different layers can be set for the inspection. Furthermore, the operator can determine individual parameters for every single zone if he thinks that the parameters suggested by the vision system automatically are not suitable.

zoom

SPECIAL APPLICATIONS

Since SHEET INSPECT Spot Check is suitable for different substrates it can be used for much more than paper sheets and ordinary printing.

SEMI-TRANSPARENT SUBSTRATES

Plastic, e.g. used as base material for smart cards, is different to paper in many respects. It may be reflective and/or semi-transparent. Although such material characteristics normally complicate the optical analysis, SHEET INSPECT Spot Check is capable of inspecting such substrates as well.

ELECTRONICS

Electronics printed or not, are a new but very promising application for optical sheet inspection - specifically for SHEET INSPECT Spot Check.

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