

# SHEET INSPECT

SEARCH FOR DEFECTS

DEFECT-FREE SHEET



DEFECTIVE SHEET



## DEFECTIVE AREAS

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

- 1
- 2
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# SHEET INSPECT

FULLY-AUTOMATIC SYSTEM FOR SECURITY PRINTING



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# SHEET INSPECT

SHEET INSPECT, Mühlbauer's one-stop inspection solution for sheets, is designed to verify the quality of substrate, print, and security features of banknotes, passport visa pages, birth certification documents, postage and revenue stamps, and many other high-security documents printed in sheet format. SHEET INSPECT perfectly combines Mühlbauer's machine design expertise with its competence in inspection technology.

Modular in design SHEET INSPECT is adaptable to specific requirements. Its solid structure and steady sheet handling ensure a smooth process even at high throughput rates. The integrated inspection units excel with high-precision quality verification and a user-friendly design.

Sheets can continuously be fed into the machine; double sheets are detected and immediately stopped. SHEET INSPECT works without gripper bars, a fact which allows full optical access to the whole sheet. While conveyed by vacuum transport, first in face up then in overhead position, all sheets pass the inspection units counted by two independent tracking systems. At the end of the inspection process SHEET INSPECT sorts accepted from unaccepted quality in different stackers. Tabbers and sheet marking systems are available.

SHEET INSPECT provides capabilities for white light (transmissive and incident), UV and IR light. The inspection software works with individual zones and layers to accommodate for different printing methods and the demanding task of inspecting security features. The monitor display array shows every portion of each sheet; defects are marked in the image. The inspection results are saved in a local SQL data base, available for further use, e.g. processing by MB data logging and information tool MB PalaMax®.

## ADVANTAGES

- Fast, accurate and complete inspection
- Objective quality assessment guarantees constant quality standards
- Constant detection performance
- Highest throughput available in the market
- Most cost-efficient system for security inspection
- Most appropriate method for banknote inspection: no complex handling of single banknotes required
- All-in-one-system for the total inspection of all security features.
- Magnetic ink recognition & OVI inspection optionally available
- Permanent protocol of inspection process & defects as evidence document
- Complete process control by MB Palamax®.



## INSPECTION CRITERIA

- Dimension, position, & angle of sheet
- Double sheets
- Notch defects
- Holes, rips, creasing, & knots in the substrate
- Register variations
- Color variations & values
- Print defects
- Presence, position & integrity of features



## AREAS OF INTEREST

- Substrate
- Offset, intaglio & screen print
- Security features
- Special print (e.g. Eurions)
- Options: UV, IR, Magnetic ink, OVI



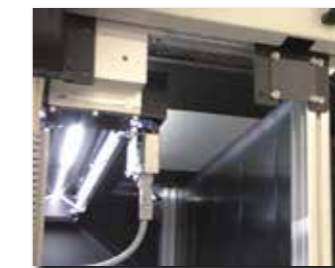
## INSPECTION PERFORMANCE

- High-speed, high-accuracy inspection
- Resolution: approx. 0.15 mm/pix.
- 64 individual zones within one note
- Layer-based inspection process
- Short set-up times (between 1 and 2.5 hours)
- Inspection results saved in a local data base with SQL interface



## CAPACITY

- Modular design (customizable)
- Rugged structure for a stable process & high volumes
- Pile capacity: 10,000 sheets
- Pile load: 1,000 kg
- Pile height: 1,600 mm
- Sheet size standard: min. 475 x 420 mm, max. 850 x 850 mm
- Throughput: up to 12,000 sheets / hour



## SHEET HANDLING

- Stable & reliable process
- High-speed feeder for continuous feed from the stack
- Alignment unit for handling different sheet formats
- Barcode reader for tracking personalized sheets
- Vacuum transport (face-up & overhead sheet position)
- Sheet tracking & counting system



## VISION

- Line-scan color cameras for print inspection (RGB & UV)
- Line-scan monochrome cameras for transmissive inspection & IR print
- In-house designed special lighting solutions (white, UV, IR)
- In-house designed inspection software
- Master- & client interface
- Tracking & counting system
- MB PalaMax® ready
- Industry 4.0 enabled



## SORTING

- Precise stacking of sheets at highest speed
- Number of stackers optional
- Exit gate for single sheets (test bin)
- Tabbers for marking certain portions in the stack (optional)
- Marking of bad notes on the sheet (optional)



## OPERATION

- Operation of all vision at one terminal
- Simple & efficient operating
- Overall live monitoring
- User right management
- Set-up on one note: settings assigned to all other notes on the sheet
- Operator support by parameter pre-views
- Live images, full screen function & zoom-in
- Defect history

### STANDARD CONFIGURATION

- 1 x Transmissive inspection
- 1 x Print inspection front (white light)
- 1 x Print inspection back (white light)
- 2 x Stacker for defect-free sheets
- 1 x Stacker for defective sheets

### OPTIONS

- UV inspection (front and/or back)
- IR inspection (front and/or back)
- Magnetic ink recognition
- OVI inspection
- Barcode readers
- Sheet marking systems
- Additional stackers
- Tabbers for stackers

