Erhardt+Leimer

SMARTSCAN

200% inspection system

Print image inspection on moving webs

Contents

200% INSPECTION · 100% AFFORDABLE · 0% DEFECTS

FOCUS ON CUSTOMER SATISFACTION

INTELLIGENT TECHNOLOGY · SMART PRODUCTS

INTERNATIONAL LOCATIONS · WORLDWIDE AVAILABILITY

CUTTING-EDGE TECHNOLOGY

AT HOME ALL OVER THE WORLD

Erhardt+Leimer
Global solutions for production of the future

Intelligent technologies and products in the highest quality designed to optimize the production processes of our customers all around the world. This is our claim as the internationally expanding Erhardt+Leimer group of companies.

With our global presence – from development to production and on to service – we are always close to the customer. We develop customer-specific solutions and provide our customers with excellent products either in digital or intelligent versions depending on their preference. Not only this, but we also set new standards for the production of tomorrow. In the process, it is not just our products that are increasingly becoming smart – our entire company is currently undergoing a digital transformation. One visible indication of this is the E+L online shop, which enables our customers to order products and spare parts quickly and easily from our website.

With more than 1,600 employees at sites across Europe, Asia, and America we deliver cutting-edge technology on-time to any location in the world.

In everything we do, we aim to use all company resources responsibly to protect the environment and demonstrate our commitment to increased sustainability.

Requirements in the label industry

100% inspection systems are becoming ever more important due to the high requirements in the labeling market. Only they can guarantee quality control over the entire web width for the detection of typical defects in label processing - from the beginning of the web through to the end.

The consequence of the challenging requirements is that, in many areas, goods may not reach the ultimate consignee without a 100% check. This hurdle presents many printers with a major challenge. With SMARTSCAN, Erhardt+Leimer is offering an innovative solution that even goes beyond 100%.

SMARTSCAN can be used not only for quality control in the labels market, but also for the checking of other printing applications, such as in packaging printing. The checking of unprin-ted, homogeneous materials, such as paper or film, is also possible.
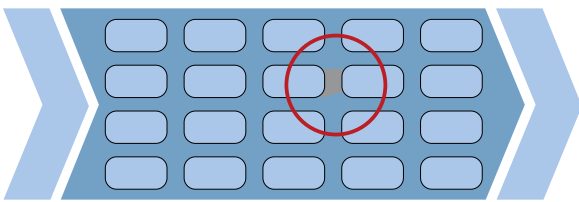
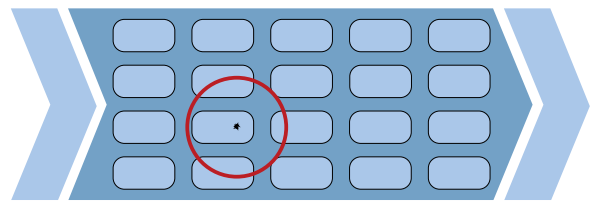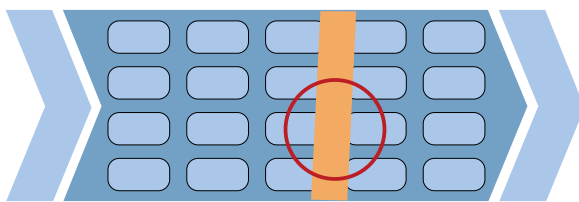## Examples of defects in label printing
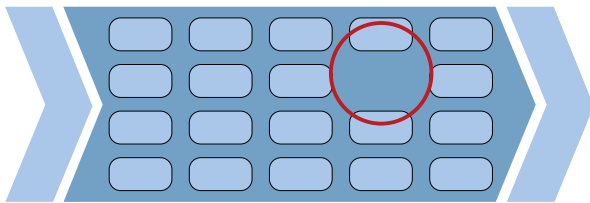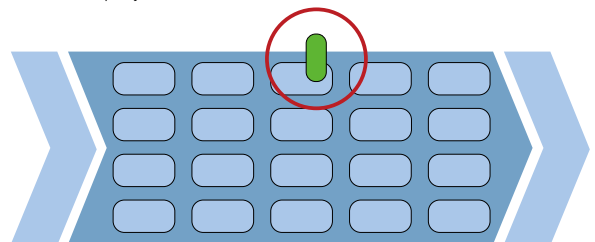
Missing label
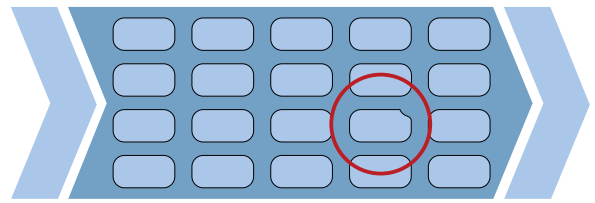
Damaged label

Unremoved matrix

Print defect/impurity

Splice point

Flag

Higher quality and productivity
due to the 200% inspection system SMARTSCAN

SMARTSCAN is the first 200% inspection system developed specially for narrow-web printing and finishing machines. The 200% inspection reliably detects print defects, damage to the material and missing labels. In addition, splice points or inserted flags are detected in a targeted manner and are displayed to the user as such.

Rewinders can be activated using output signals, in order to locate defects for repair. However, signal lamps or other events can also be triggered, for example, to warn the user as quickly as possible.

The web monitoring integrated in SMARTSCAN as standard displays a static image of the moving web to the machine operator. The special illumination concept also displays strongly reflective areas, such as glossy foil, in a homogeneous manner.

With its unique operating concept, SMARTSCAN opens up new avenues in the industry. The system is set up and ready to start with just one button-press. This means that external training courses are no longer necessary and the commissioning time is reduced to a minimum.

Its compact design means that SMARTSCAN can be integrated quickly into all production machines without major work. The interface for the user is a touch monitor, which displays all the functions clearly.

Main functions

- Camera system with unique 200% inspection function
- For printing and finishing machines in label applications and narrow-web applications
- Continuous double inspection of the entire width and length of the web
- Web monitoring with zoom function
- Detection of print defects, missing labels, unremoved matrices, splice points, flags, color defects, damage etc.
- Counting function for labels and defects
- Log function for the inspection runs
- Signal output for customer-side defect location or to activate signal lamps

SMARTSCAN product video
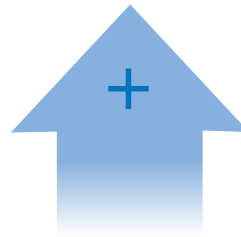
200% INSPECTION

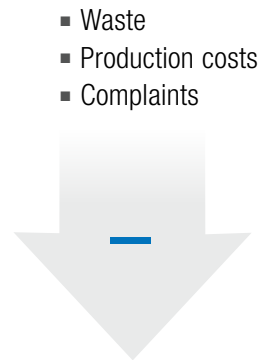**100% AFFORDABLE**

0% DEFECTS

REVOLUTIONARY ONE-CLICK OPERATION

Benefits of SMARTSCAN

- Low-cost entry for equipping all production machines
- Operational with just one button-press
- Replacement of external hardware (sensors and stroboscope) saves time and money and is beneficial to health
- Color cameras with fault-resistant and rapid Ethernet communication
- Upgrade option for later adjustments
- Simple system integration (no external technician required)
- Prepared remote maintenance function + global E+L service availability

+

- Waste
- Production costs
- Complaints

- Quality
- Productivity
- Production speed

Revolutionary operating concept

1. Teach-in image
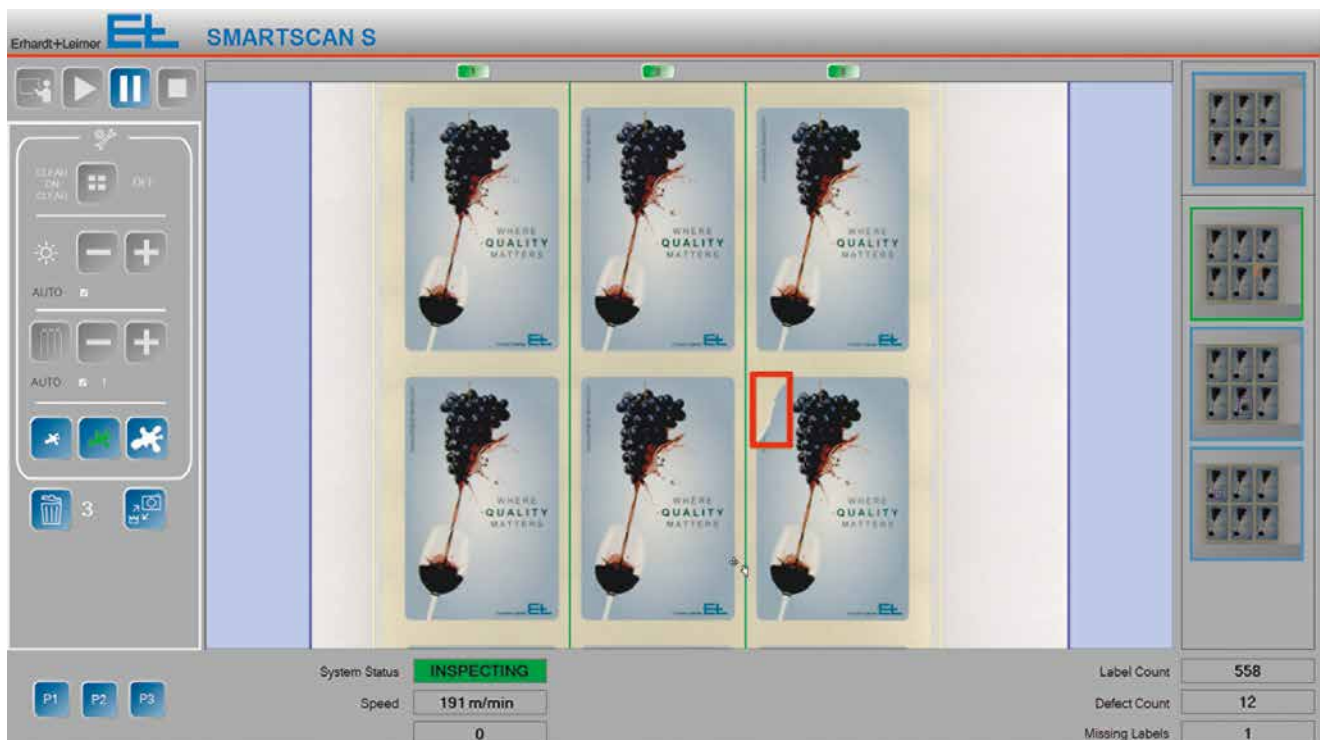
2. Start inspection

✓ **DONE!!!**
The unique, automated operating concept means that no time is wasted on operating the system and the user can focus on their actual work. There is no need for time-wasting training courses.

System Status	INSPECTING
Speed	191 m/min
	0

Label Count	558
Defect Count	12
Missing Labels	1

The 200% concept

More certainty due to double checking

SMARTSCAN uses a unique, double image acquisition method for the inspection. Here, two image streams are acquired with a temporal offset – once with incident light and in parallel with transmitted light. Each of these image streams is compared with a dedicated reference image (golden template) and checked for defects.

The advantage is that, along with classic print defects, also material defects such as damage in the label or on the carrier, unremoved matrix, offset on the die cutting position, splice points or residue/insects on the rear of the label become visible. There is also special hole detection for films and foils.

Camera

Incident light

Back light

Only incident light method:
Defect detection with **100% inspection**

Additional illumination of the rear:
Expanded defect detection with **200% inspection**

Defect detection with incident light

- Print defects (1)
- Color changes (2)
- Soiling (3)
- Splashes/waste (4)
- Smears (5)
- Missing labels

Defect detection with transmitted light

- Unremoved matrix (6)
- Die cutting position
- Splice points on the rear of the web (7)
- Damage (8)
- Holes (9)
- Flags

Application concepts

SMARTSCAN in finishing
- Simple system integration in all standard rewinding and finishing machines
- Inspection speeds up to 600 m/min
- Precise positioning of the defects for repair purposes
- 24 Volt signal outputs for simple integration

SMARTSCAN

Stop position /
defect repair

SMARTSCAN on a finishing rewinder

Unwinding
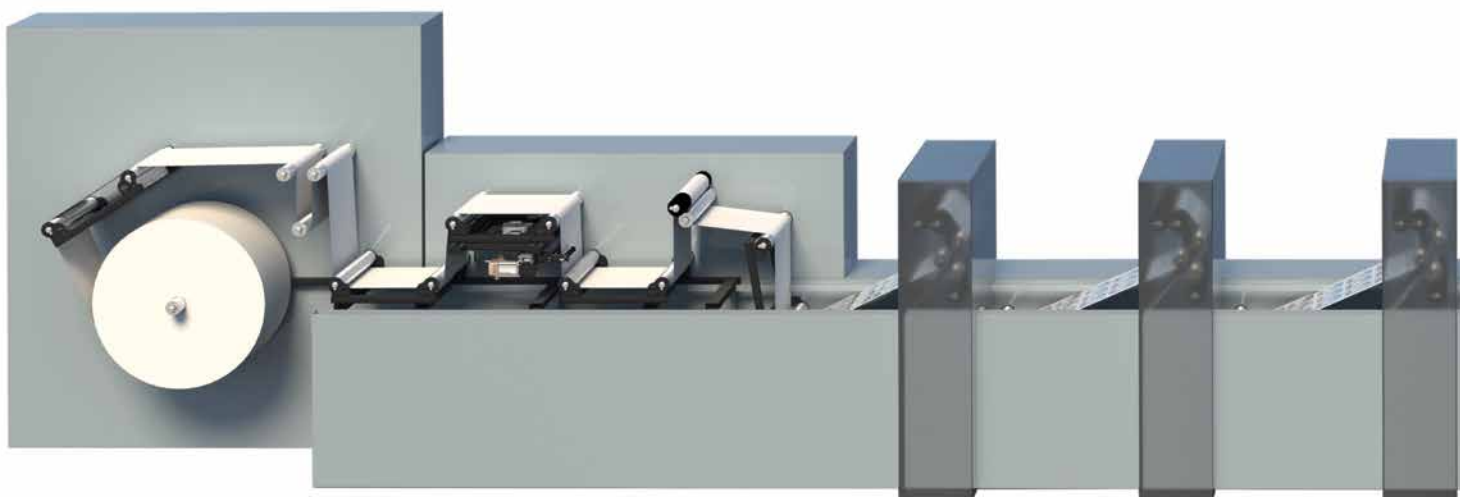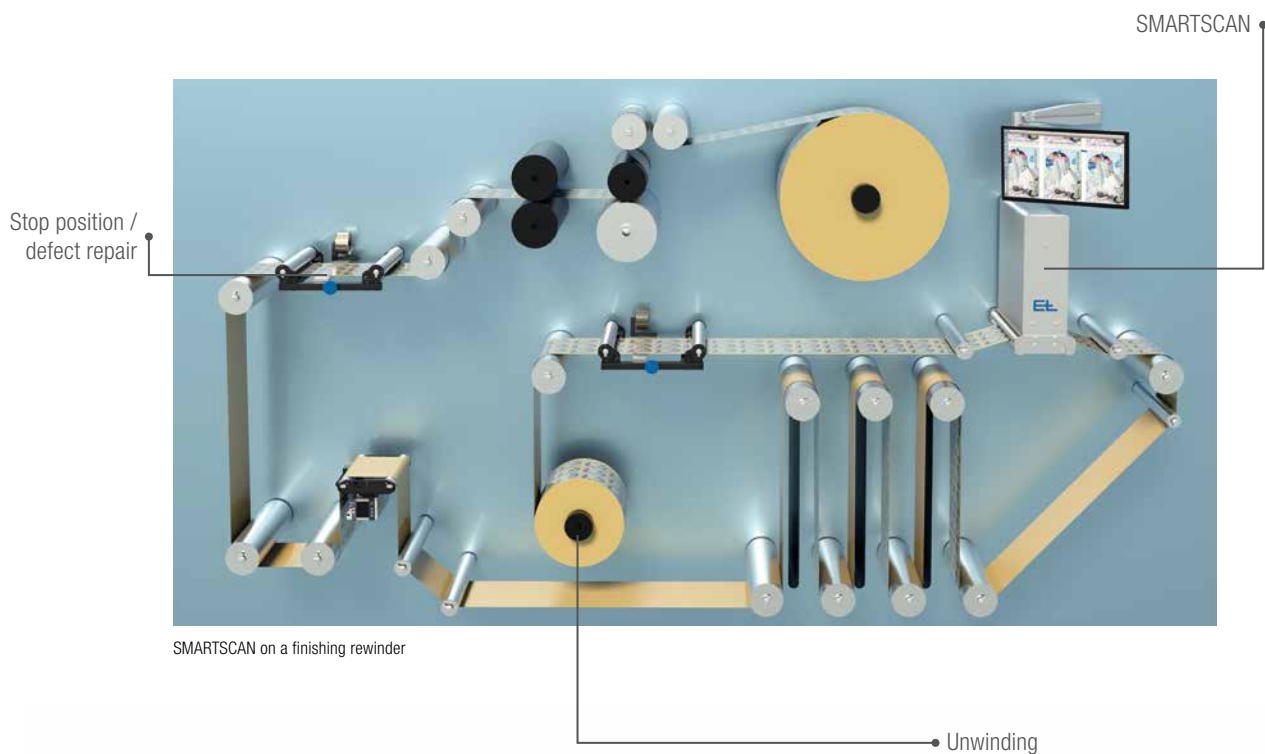
SMARTSCAN on a label printing press

Application concepts

SMARTSCAN in the print shop

- Simple system integration in all standard printing presses
- Location of the system behind the die cutter to detect printing defects, removed labels or matrices
- 24 Volt signal outputs to activate signal lamps for rapid alarming of the users on, e.g. repeated defects

## SMARTSCAN combined with ELSCAN

- Web monitoring system ELSCAN supplements SMARTSCAN with high-resolution image display
- Positioning of ELSCAN before matrix removal for checking print/register marks and the die cutting position
- Positioning of SMARTSCAN after matrix removal for final printed image inspection

SMARTSCAN on a Flexo printing press

ELSCAN OMS3
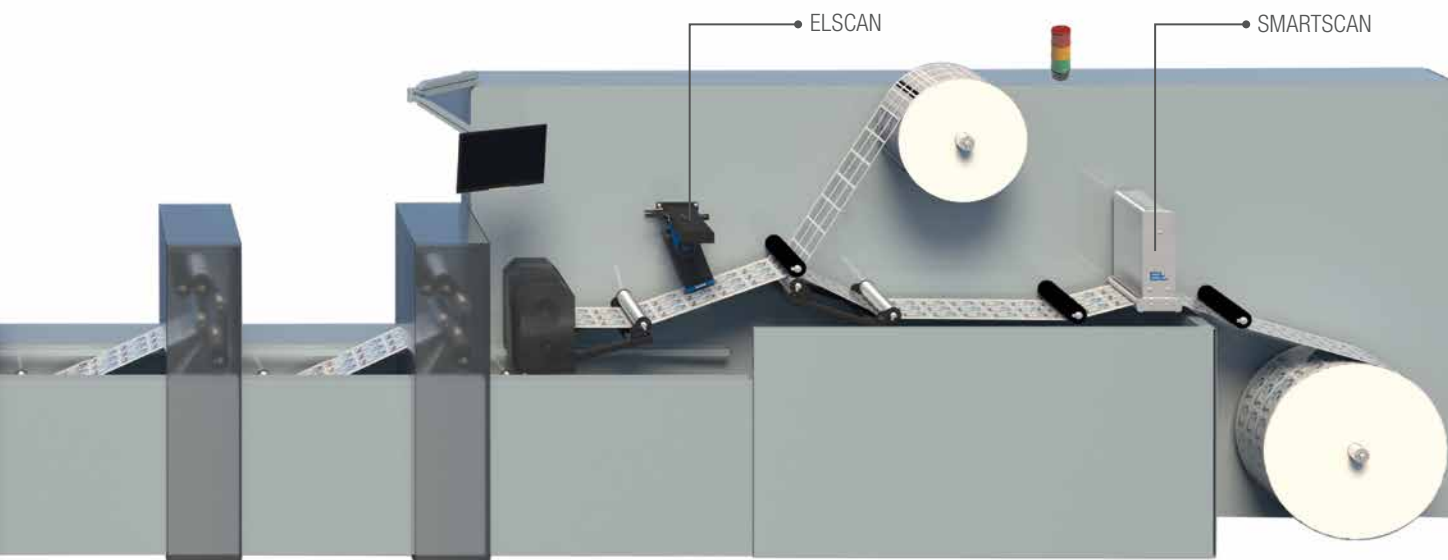
ELSCAN   SMARTSCAN

Surface inspection

Besides the print image inspection, SMARTSCAN can also be used as a surface inspection system. Depending on requirements, the material is checked here for impurities, damage, holes, insects or other faults, in order to determine sources of defect or quality defects at any early stage. Naturally, SMARTSCAN is also set up automatically during the surface inspection. The defect classification aligns itself to the conditions of a surface inspection.


Hole detection (pinhole module)

For example, 100% tightness is a decisive factor in the food industry or in the pharmaceuticals industry. In these industries, holes in the material are intolerable defects, which must be detected reliably. However, reliable defect detection can only be guaranteed using the transmitted light method, which has the disadvantage that the print image is invisible.

Here too, the 200% inspection technology offers the decisive advantage. It allows hole defect detection through background lighting, in which the incident light is switched off completely. The incident light is then connected after a time delay for the inspection of the print image. Quality control with just one system has never been as secure as it is with SMARTSCAN.
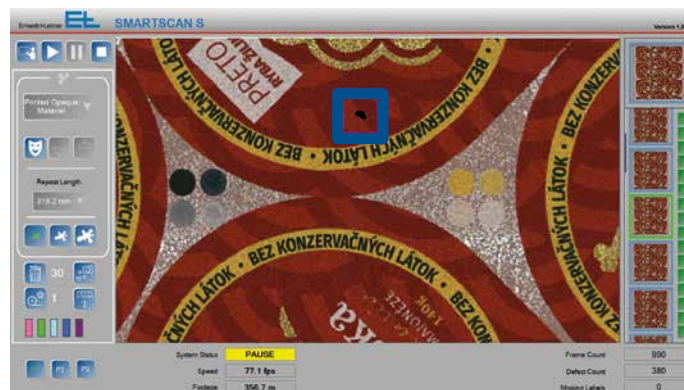
View for incident light (100% inspection): Print defect
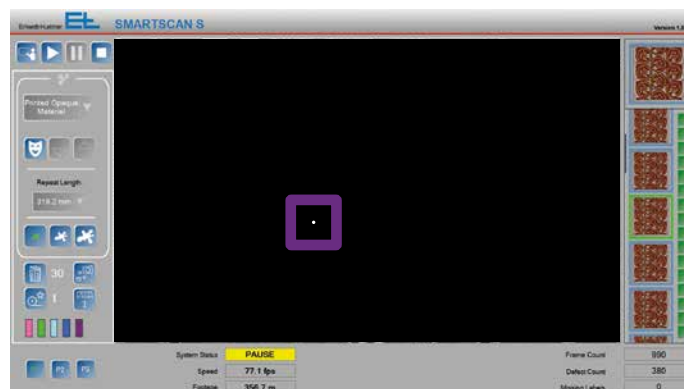
View for transmitted light (200% inspection): Hole defect

SMARTSCAN UV for fluorescent substances

SMARTSCAN UV combines white light with UV lighting, in order to make fluorescent colors and paints visible. This allows the inspection of security applications and design elements, which are not visible to the naked eye. The wavelength for the UV lighting is between 365 nm and 370 nm.

Here too, 200% inspection technology is used, through which further defects are detected, which could not be seen simply with UV light. The advantage gained from this creates considerable added value compared with applications that can only inspect in 100% mode.

In addition to the UV inspection, Erhardt+Leimer also offers the ELSCAN web inspection systems with UV lighting for a high-resolution display of UV colors, UV paints and UV adhesive applications, in order to align the register perfectly.
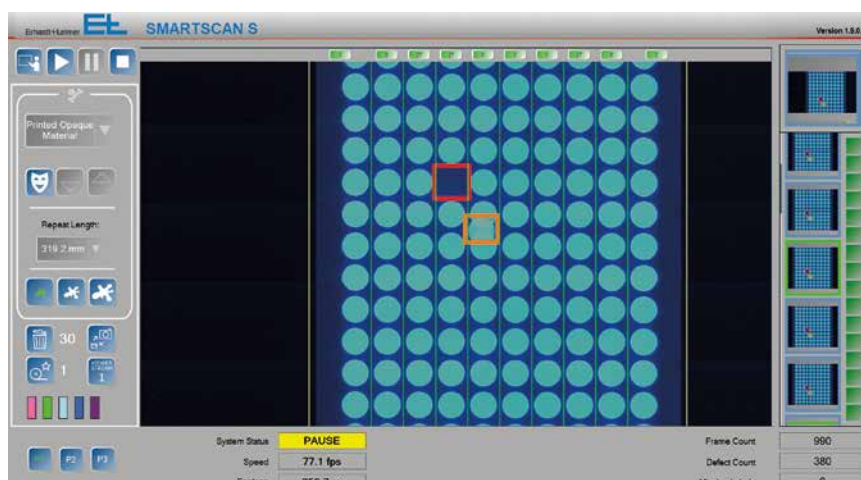
Transparent labels with UV adhesive

Additional functions

- Automated defect classification for statistical recording of, for example, missing labels, matrix residues, printing areas, splicing, flags, and pinholes
- Order library for repeat jobs – up to 2,500 jobs can be saved

- PDF comparison to ensure that the reference image corresponds to the target image
- Width measurement and distance measurement in the horizontal, vertical and diagonal directions

- Image memory module for documenting important security features
- Barcode and 2D code reader
- BDE connection to simplify and automate further operating sequences

The security concept

A major plus for IT and system security: Even if there is a power failure, virus attacks, targeted manipulation or operational defects, the SMARTSCAN security concept means that there is no risk of losing data or that SMARTSCAN is no longer ready for operation.

The operating system, the SMARTSCAN software and the system data are located on the write-protected C partition of the SMARTSCAN PC and
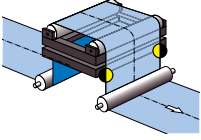
are thus safe. It is only possible to write to the D partition, which contains the system parameters, order data and roll reports. If necessary, the original state can be restored in seconds by restarting SMARTSCAN. The operating system does not need to be shut down for this. The security concept makes SMARTSCAN very robust and reliable.
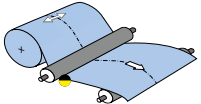
Technical Data

200% inspection system SMARTSCAN					
Web width	170 mm (7")	250 mm (10")	350 mm (14")	450 mm (18")	550 mm (22")
Field of view	180 mm	260 mm	360 mm	460 mm	560 mm
Resolution	Depending on the camera resolution				
Dimensions (camera unit) LxWxH		430 x 192 x 433 mm		530 x 192 x 519 mm	630 x 192 x 400 mm
Max. speed	600 m/min (system-dependent)				
Max. web offset	±10 mm				
Camera resolution	2 megapixels/3 megapixels/12 megapixels				
Chip	RGB (color)				
Camera interface	Ethernet				
Operating system	Windows 7 Embedded (for industrial applications)				
Monitor	21.5" LED touchscreen (HD resolution)				
Monitor connection	HDMI				
Operating voltage	100 – 240 V AC, 50 – 60 Hz				
Current consumption	3.5 A				
Temperature range	0 °C to +45 °C				
Protection class	IP 20				
Voltage for inputs/outputs	24 V DC				
Max. current consumption of outputs	150 mA				
Defect types (examples)	Missing labels, print defects, color defects, register defects, die cutting defects, insects, holes etc.				
Material types	Paper, film (transparent, clear-on-clear, opaque, glossy foil)				

Questionnaire

General data

Customer	
Street	

Zip code		City/town	
Country		Internet	
Contact person			
Phone		eMail	
Project			

Technical Data

Type of machine	❏ Press	❏ Rewinder	❏ _____
Make			
Web width	Max. _____ mm		
Web speed	Max. _____ m/min		
Web type	❏ Die-cut labels	❏ Labels	❏ Flexible packaging / unpunched film
Web surface	❏ Transparent		❏ Not transparent
Ambient temperature	_____ °C		
Operating voltage	❏ 230 V AC	❏ 110 V AC	❏ _____ V AC

Technical features

Function	❏ SMARTSCAN (coarse defect inspection)	❏ SMARTSCAN S (fine defect inspection)	
Web run	❏ Left to right	❏ Right to left	
Hardware options	❏ Reflection module	❏ UV lighting	❏ Monitor arm

Comments

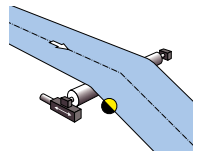|	
Date	Issuer

Other products for the paper and film/foil industry
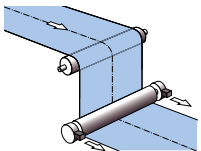
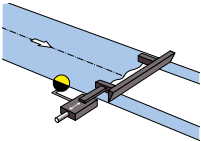**ELGUIDER** – Web guiding systems

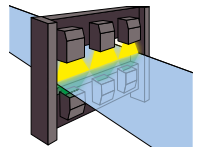**ELWINDER** – Web guiding systems for winding stations (brushless)

ELBANDER – Belt position control systems
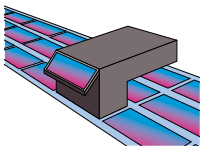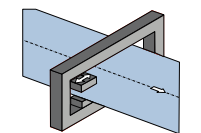
ELTENS – Web tension control systems

ELPOSER – Positioning and follow-up control systems

ELSIS – Surface inspection systems

ELSCAN – Web monitoring systems

ELTIM – Thickness measurement systems

Erhardt+Leimer

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