SUPERSCAN

Surface quality control camera inspection system for raw and decor panels

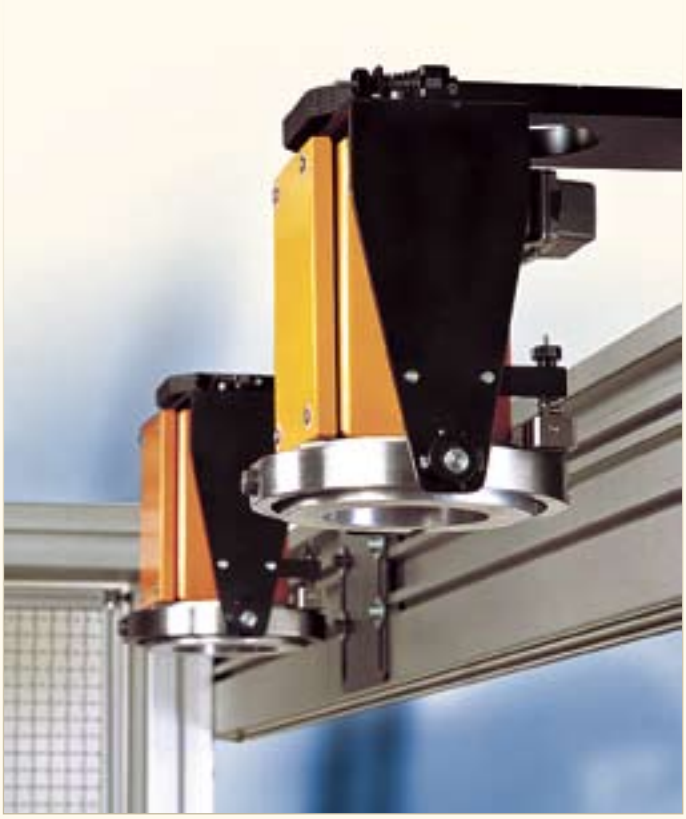
Objective inspection using industrial image processing

Due to ever increasing production speeds and new press technologies, the demands on inspections of the panel surface are also increasing. More and more will be expected of people as “Control instruments.”

Inspectors can be easily distracted from their task for brief moments. In this case, panels can reach downstream production processes and the customer without being inspected. This situation can lead to unsatisfied customers and product return claims.

Inspection of the press size panels allows for product quality analysis and permits quick adjustments of the production process.

The SUPERSCAN system inspects 100 percent of the press size wood based panels at full production speed.



Camera system

SUPERSCAN in production line

Typical defects of decor panels

Decor panels may show the following defects:

Type of defect	Cause of defect
Dark patches	Voids, contamination
Light patches, small	No local melamine flow due to: ■ raw panel defect
Light patches, big	No melamine flow due to: ■ low press temperature ■ low press pressure ■ defective impregnation
Missing or slipped overlay or sheet	Laying error
Cracks in sheet or overlay	Laying error
Edge defect	Quality of raw panel
Shift of pattern, pattern distortion	Laying error
Scaling of pattern	Quality of sheet
Scraps of paper on the panel	White or pattern
Dent or delamination	Quality of raw panel
Greasy edge	Condition of pressing plates
Shift of embossed to pattern	Laying error

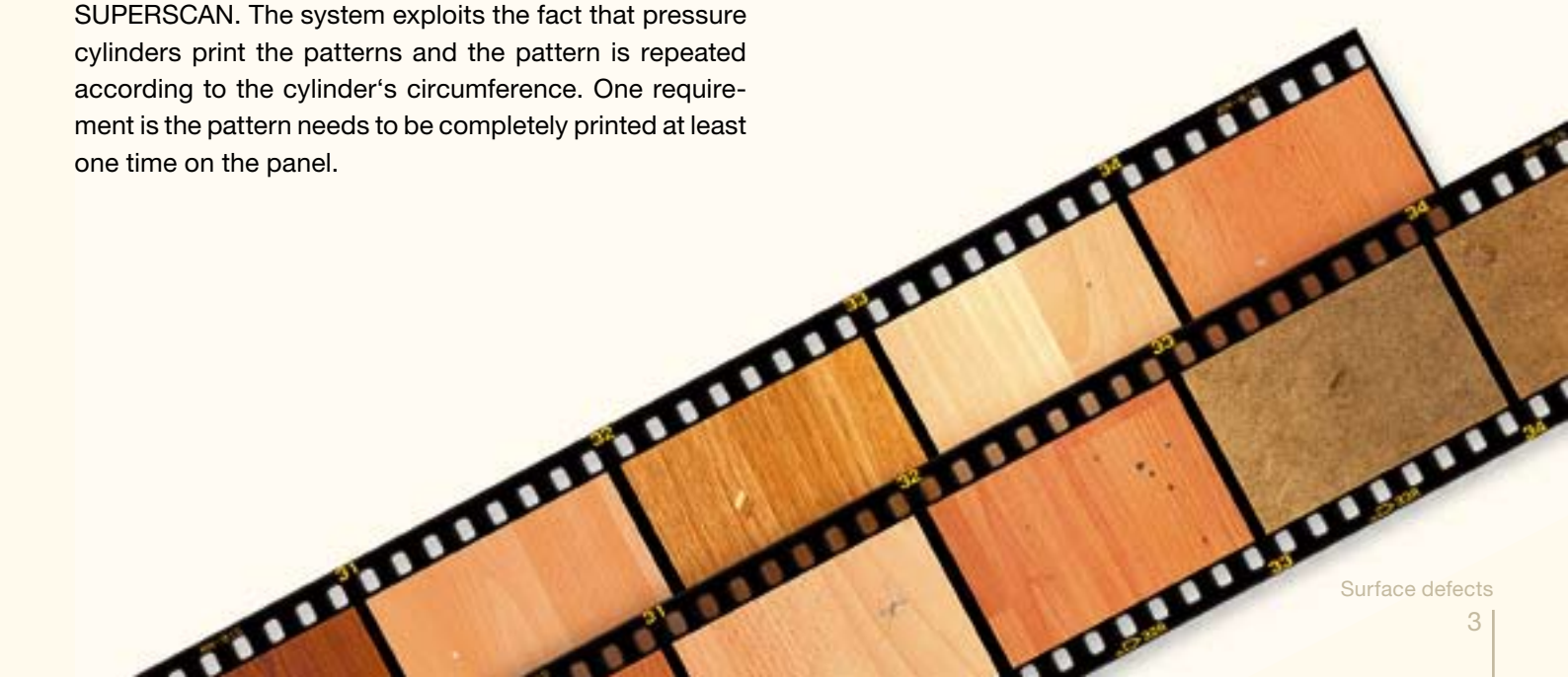
Application

The inspection of decorative wood based panels (laminate floorings, furniture panels, lacquered or printed panels) is the main application for the SUPERSCAN system.

Through the use of completely new technology in image processing systems, it is very easy to monitor many different patterns with the GreCon Surface Inspection System SUPERSCAN. The system exploits the fact that pressure cylinders print the patterns and the pattern is repeated according to the cylinder‘s circumference. One requirement is the pattern needs to be completely printed at least one time on the panel.

The strength of the system is based on its ability to differentiate between minor gradations of shades in the pattern, such as knots, and actual defects that do not belong to the pattern.

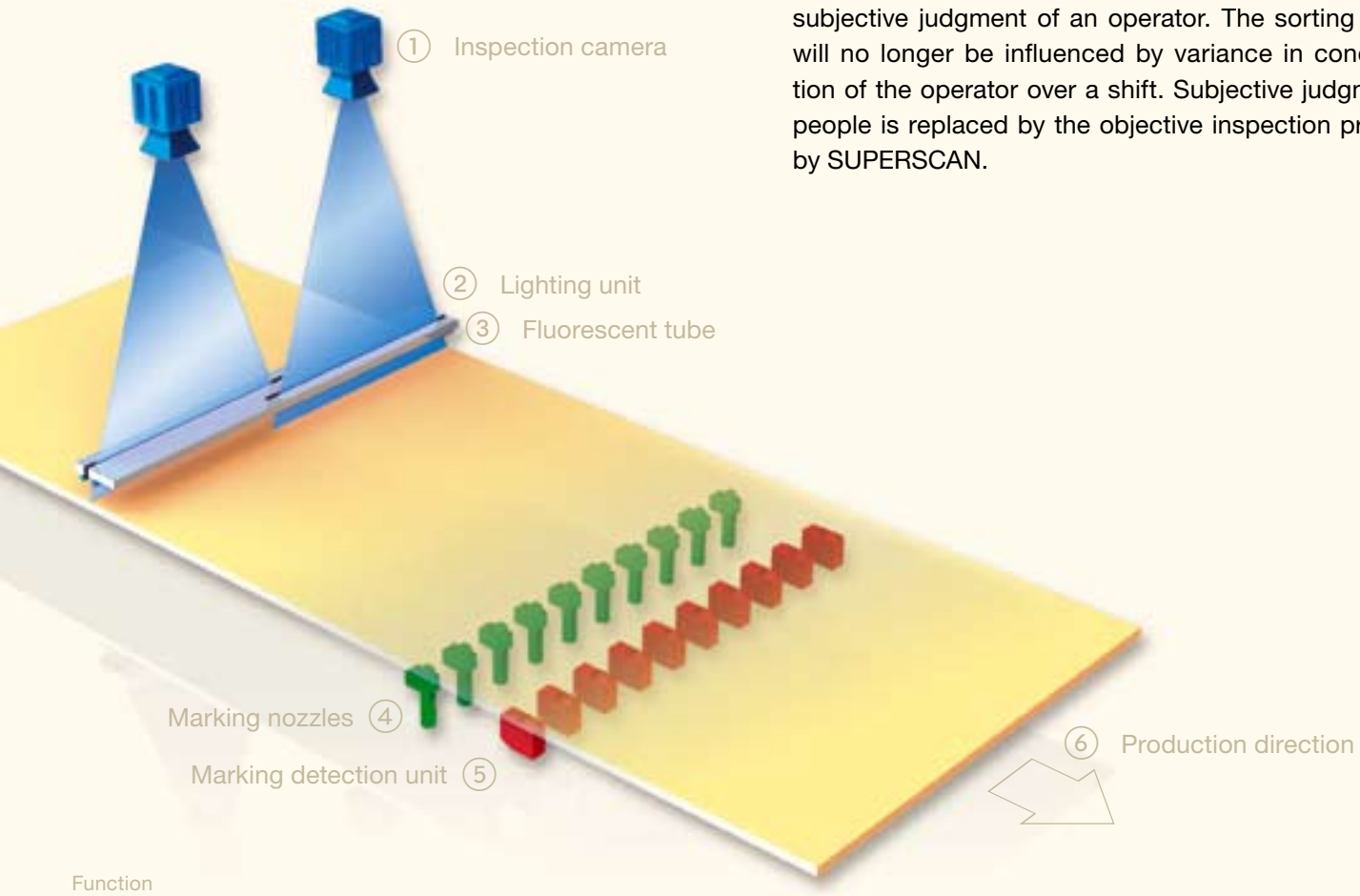
The system is also suitable to inspect uncoated particleboards or MDF panels.



GreCon SUPERSCAN is self-learning. Two successive panels are scanned during the production process and their data compared. If the deviations between the panel scans are smaller than the preset tolerance limits, the data is used as a master. All the following panels will be compared with this master. The learning procedure is simple and takes only a few minutes. New patterns like coated sheets, wood pattern, and tile structure can be scanned within a very short time.

Marking and Recognition

When a panel is defective, the defects are recognized and displayed on the monitor. Through the evaluation of type, size and position data, the quality can be determined. This information allows for adjustments in the production process and drastically reduces rejects.



As an option to the SUPERSCAN system, GreCon offers a panel marking system, which marks the defective areas by spraying fluorescent ink on the press size panel. After cutting, only the individual marked panels that are recognized as defective are sorted out.

It is also possible to classify the panels according to the type, position and number of defects. Then the system transfers the information to the PLC of the production machine, which will carry out the sorting of the panels into the correct stack.

Inspection reliability

SUPERSCAN inspects the surface pattern of each panel online to ensure consistent sorting. Detailed conclusions for upstream production process adjustments are possible through fault and statistics reports. Thus, not only the sorting but also the entire production process can be optimized.

Classification of the panel no longer depends on the subjective judgment of an operator. The sorting quality will no longer be influenced by variance in concentration of the operator over a shift. Subjective judgment of people is replaced by the objective inspection provided by SUPERSCAN.

Software

Visualization software of all GreCon measurement systems is based on the Microsoft Windows operation system. The SUPERSCAN software consists of the following program modules:

Recipe Management

All different panel types and production parameters related to the measuring system are stored in this product database.

Visualization

Visualization is the core of this software package. The data gained by the image processing software is collected, recorded and graphically processed. The simple menu structure is consistent with all GreCon measurement systems and enables intuitive operation.

Clear information and graphics allow the operator to take action on the running production process rapidly and efficiently. An image of the panel is displayed showing defects position and type. It is also possible to store and display the sectional view.

Database

The database stores the pattern masters for easy recall when product type changes.

On-line customer service

To assist the operator, any GreCon measurement system has an on-line help system. A direct modem connection between the GreCon service department and the GreCon system provides quick response. Adjustments, parameter changes, and software up-dates can be accomplished on-line.

Operator display

System‘s construction

The O-frame consists of solid four footing construction which the lighting unit is mounted. The lighting unit height can be adjusted according to panel thickness.

Two pneumatic cylinders allow the complete lighting unit to swing-up. This „emergency escape“ function protects the lighting unit from any damage that might be caused by stacked panels or from blisters. A laser light barrier triggers the emergency escape function.

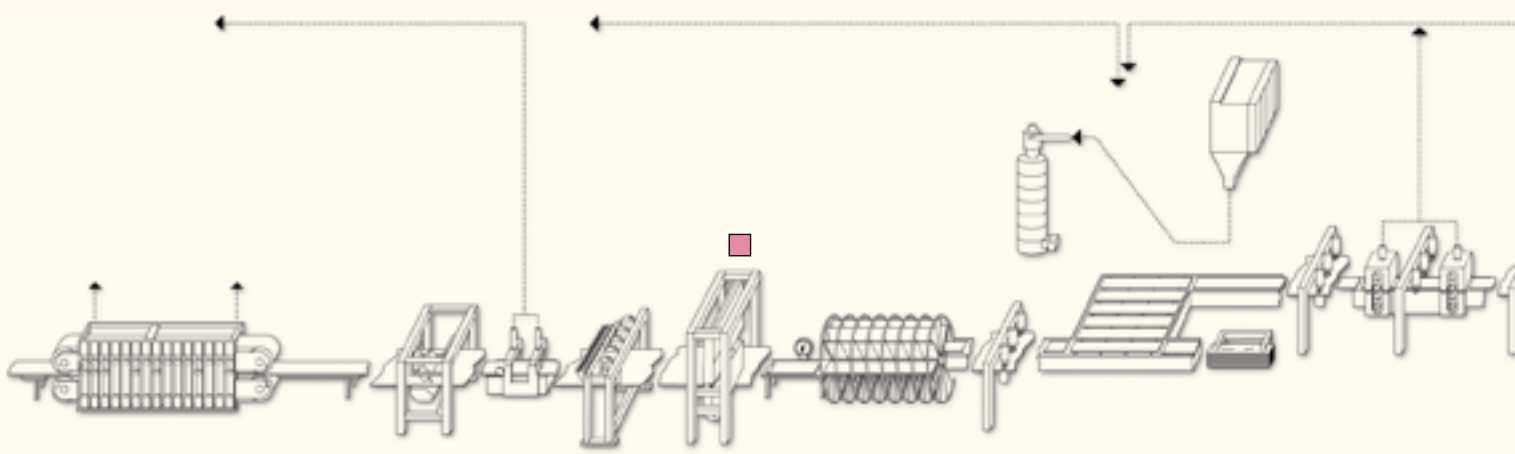
The lighting unit uses the system air for cooling and over-pressure to clear contamination. Each camera is encapsulated to protect against dust. Lighting utilizes common fluorescent lamps and a special lighting control.

Applications

- Laminate floorings
- Lacquered panels (single-color or pattern)
- Furniture panels (single-color or pattern)
- Particleboard sanded
- MDF sanded / un-sanded
- Others: PVC, print, lamination etc.

Furniture board inspection (two-sided)


Laminat flooring inspection (one-sided)



Characteristics

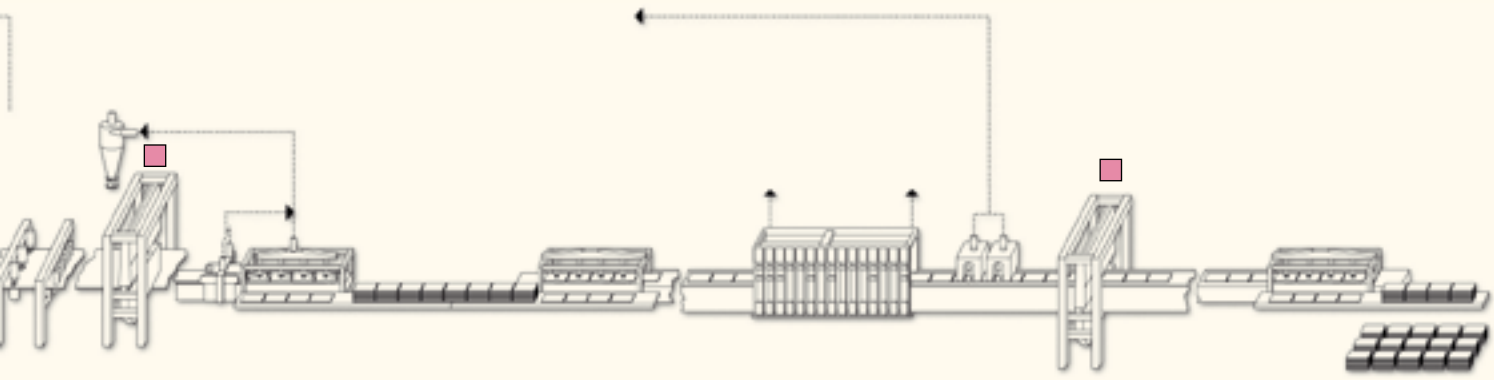
- Objective judgment of quality
- Statistical evaluation
- Graphical display of the whole panel
- Easy operation
- Quick learning of new patterns
- Low operating costs
- Safe and objective inspection
- Defect location data on press size panels makes reject reduction possible
- Reduced manpower costs
- Remote diagnostics by GreCon customer service

Technical Specifications

- Panel width: .....900 mm to 3100 mm
  36 inch to 122 inch
- Panel length: .....unlimited
- Production process: .....cycle or continuous
- Passage speed: ..... 180 m/min
  540 ft/min
- Panel thickness:.....whatever desired
- Defect size: ..... from 1 mm²
  from 1/25 inch²
- Power supply: ..... 230 V / 115 V
- Frequency: ..... 50 Hz / 60 Hz
- Compressed air supply:.....6 bar
  90 psi

Cleaning unit

Marking device



GreCon

Fagus Factory, constructed by Walter Gropius in 1911

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