DIEFFENSOR

Online X-Ray Mat Scanner for Weight Per Unit Area and Foreign Object Recognition

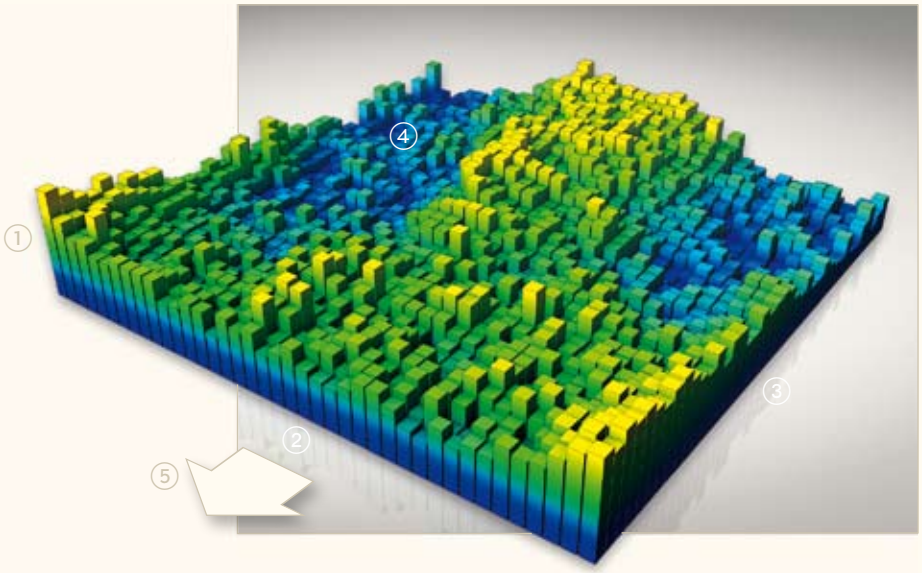
GreCon®

Weight Per Unit Area and Material Distribution

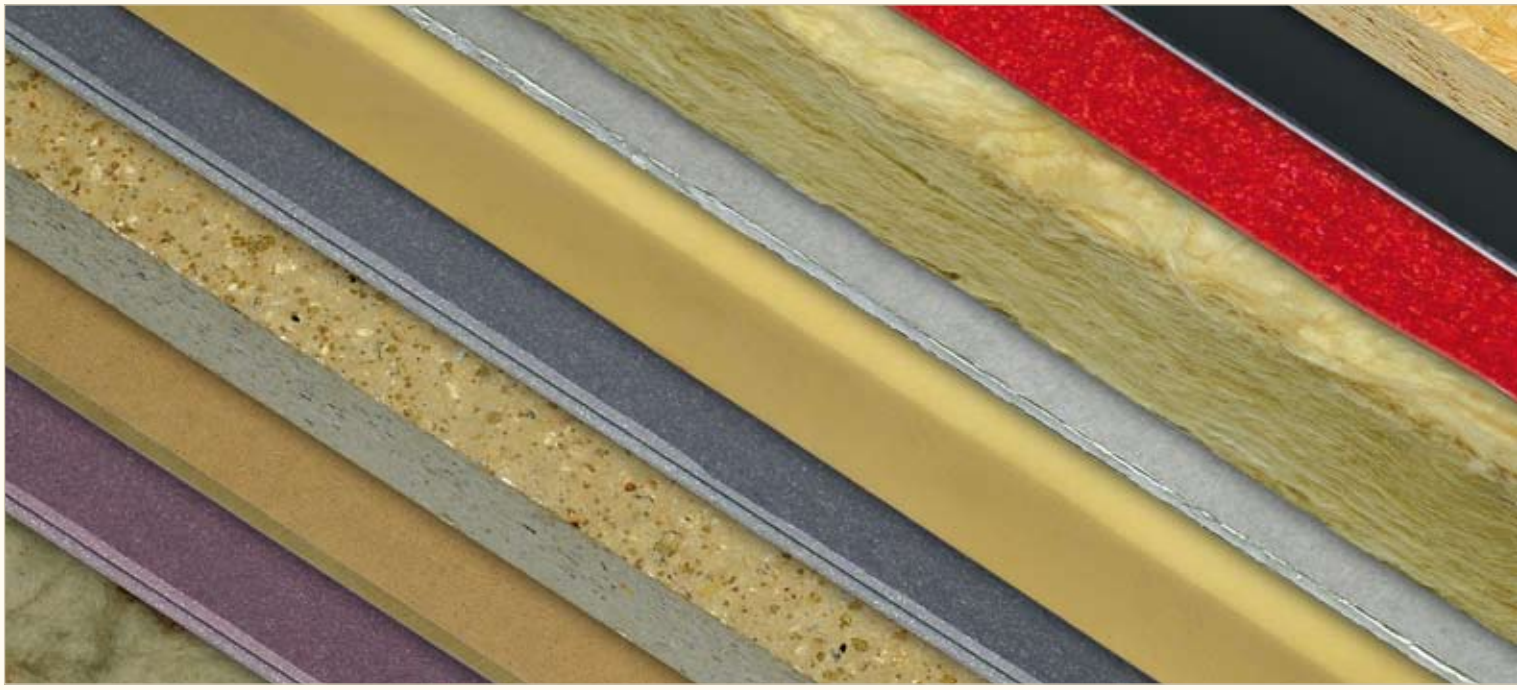
The GreCon Mat Scanner DIEFFENSOR with X-ray technology measures weight-per-unit-area as well as the material distribution. The scanner measures the whole product by continuously measuring across the entire production width.

Exact graphical and numeric representations enable the operator to adjust the forming process to achieve consistent quality while the use of material and energy is optimized.

Continuous monitoring of the weight distribution provides for an optimal flow of production and prevents unequal weights in the process. Adjustments to the production process are based on real-time measuring data displayed on the visualization computer. Detailed data reports can be produced for extensive evaluation of production processes over the long term.



① Weight per unit area
② Mat width
③ Mat length
④ Deviation from weight per unit area
⑤ Feed direction



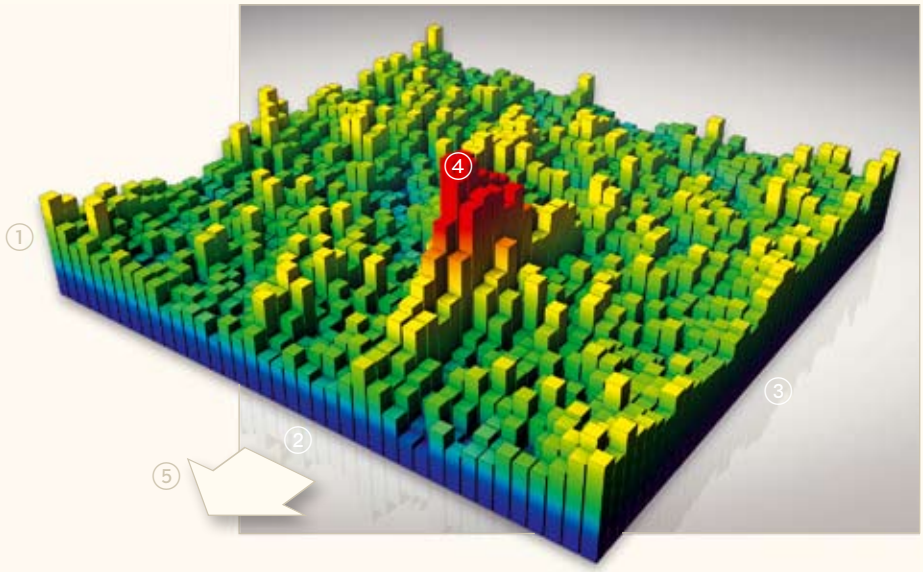
Selection of different materials measured by the DIEFFENSOR

Foreign Object Recognition

The GreCon Mat Scanner DIEFFENSOR measures volumetric or density differences and can also recognize foreign objects in the material or product. The DIEFFENSOR is able to identify high density metallic and non-metallic foreign objects. For example glue lumps, fiber lumps, hot and wet spots, as well as plastic and aluminum parts.

The DIEFFENSOR recognizes form and mass of a foreign object and stores this image in 3-D graphics for evaluation at a later time. One example is hot spots, which are identified as foreign objects during the production of fiberglass and rock wool. These hot spots can cause damage to the product and the production line.

During the production of chipboards, high density foreign objects can cause irreversible damage to the steel belts of a continuous press. Likewise, cavities or bubbles during plastic production can also be recognized by the DIEFFENSOR.



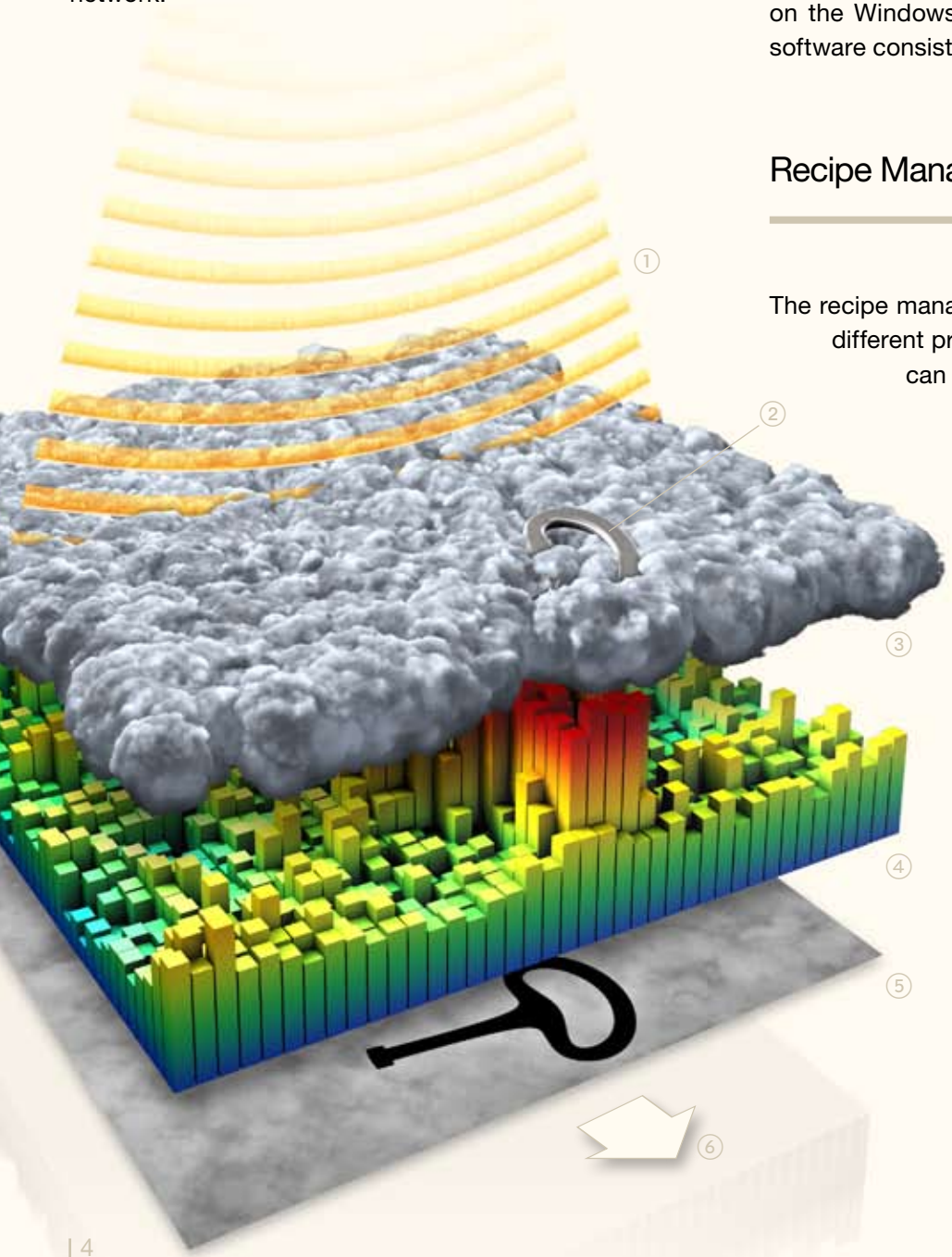
1 Weight per unit area
2 Mat width
3 Mat length
4 Foreign objects
5 Feed direction

Measuring Principle

The DIEFFENSOR operates in a non-contact method. The x-ray sources are installed above the production line, and high-precision sensors below the measured material. Depending on the specific density and the amount of material, more or less x-radiation is measured at the sensors, from this the measuring data is derived.

Network Connections

For data transfer of the product categories to the process control system OPC and ODBC will be available to the network.



1 X-Ray
2 Foreign object
3 Measured Material
4 3D-Visualisation
5 2D-Visualisation
6 Feed direction

On-Line Customer Service

GreCon measuring systems are equipped with a modem or VPN, which provides a direct connection to GreCon service when needed. Support, changes in parameters, software updates and troubleshooting are all possible on-line.

Software

The software of all GreCon measuring systems is based on the Windows operating system. The DIEFFENSOR software consists of the following program modules:

Recipe Management

The recipe management is a product database in which different product types and production parameters can be stored.

Visualization

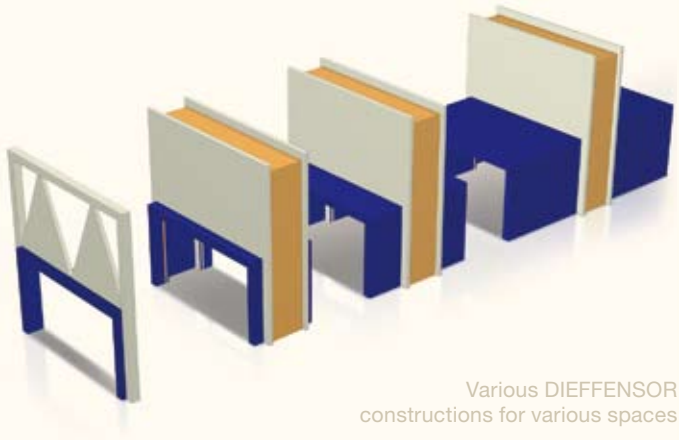
The core of the software package is the visualization software. It records, stores and graphically represents all measured data. The simple menu structure, which is identical for all GreCon measuring systems, makes an intuitive operation possible. Clear information and graphics enable the operator to quickly and effectively adjust the running production process. The measured values are represented as a 3-D picture. Out of tolerance limits are identified with changes in color and tolerances relays, with voltage-free outputs, are activated.

SQL Database

This database stores the measured values and provides a function to export them to the other file formats for further processing and evaluation. A uniform structure provides easily accessible date for process control systems

Foreign object recognition

The software, specifically developed for this task, provides a highly sensitive inspection of the product for unwanted foreign objects. On recognition of a foreign object, a quick signal is sent to the process control system.



Various DIEFFENSOR
constructions for various spaces

Application example glass-wool

Technical Specifications

- Measuring ranges: ..... 0 to 50 kg/m²
  ..... 0 to 10.24 lbs/sq ft
- Mat speed: ..... 0 to 3.000 mm/s (180 m/min)
  ..... 0 to 118 in/s (7086 in/min)
- Mat height: ..... 0 to 500 mm
  ..... 0 to 20 in
- Mat width: ..... 0 to 6.000 mm
  ..... 0 to 236 ft

Applications

- Mineral Wool
- Fiberglass
- Gypsum
- Synthetic Material
- Insulation
- Chipboard
- MDF
- HDF
- OSB
- Particleboard

Hardware Advantages

- 100% measuring of the entire product
- Non-contact measurement

Software Advantages

- Recipe administration
- 3-D representation OPC interface for connection to process technology PLC
- Storage of the measured data in an SQL database
- Preparation for network connection is standard
- Telediagnostic service through GreCon after-sales service
- Visualization with various representations of the measured values

Defect identification in plastic shaped parts e.g. shoe lasts

DIEFFENSOR in Glass-Wool-Line

DIEFFENSOR in MDF-Line

Customer Advantages

- Complete determination the of weight-per-unit-area
- Foreign object recognition to avoid damage
- Complete picture of the material distribution quality
- Investment in usual metal detection system is not necessary
- Improved product quality
- High-resolution data storage for statistical evaluation
- Long-term storage of production data

Application Examples

In the fiberglass industry the DIEFFENSOR would be installed prior to or after the tunnel furnace.

In the mineral wool industry the DIEFFENSOR would be installed after the pendulum forming station.

For the MDF, PB, and OSB production the DIEFFENSOR would be installed prior to the main press.

Defect recognition in insulating foam materials and other materials

Defect recognition in pressed materials

DIEFFENSOR in HDF-Line

DIEFFENSOR in OSB-Line

GreCon

Fagus Factory, constructed by Walter Gropius in 1911

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