IR 3000 WBPi

Online Moisture Measurement with Infrared Technology

GreCon®

Production and Quality Control with the GreCon Moisture Analyser

Exploit all reserves of your production, homogenise your process, increase the availability of your equipment and increase your profit.

Wherever precise product moisture is required, the online moisture analysers provide the users with the necessary information.

The continual availability of product properties allows for easy adjustment of the production process to ensure a high standard of product quality.

For the production of wood based panels, the moisture content of the material used is of utmost importance. Chips and fibres must be neither too wet nor too dry. If they are too wet, reductions in panel quality and slower production speeds will occur. If they are too dry, energy is wasted. The same applies to glued material.

Operator interface and sensor

Construction of the IR 3000 WBPi

The Moisture Analyser IR 3000 WBPi consists of a non-contact measuring head and an operator interface for calibration and parameterisation of the moisture analyser.

The operator interface is installed near the measuring head where it is also used as an external display in the measuring position. This arrangement makes reading of the measured moisture values easy when taking samples for laboratory measurements.

By using a suitable window pane, it is also possible to measure the moisture of material flows in enclosed conveying systems.

The measured values can be transferred to a higher-ranking process control system via a serial interface to display the values in the control station.

Analog outputs and programmable alarm contacts are available for additional control tasks. The housings of measuring head and operator interface are dust- and water-proof.

For applications in extreme ambient temperatures, appropriate accessories are used.

Up to 80 different system adjustments can be stored in the product memory, which makes an adaptation to any material structure possible.

Combination with other Measuring Systems

To make the evaluation of the product or material features easier, the IR 3000 WBPi can be combined with other GreCon measuring systems. When connected to the GreCon Weight Per Unit Area Gauge BWQ 3000, further evaluation of the material features can be realised. Using joint evaluation of weight per unit area and moisture, the dry mass of the chip or fibre mat is automatically calculated.

Measuring Principle

The non-contact online measuring system works with an optical measurement transducer. Light of the NIR region is used, which is absorbed by the material moisture. This means that the more moisture in the material to be measured, the less light is reflected by the material.

A light beam, which is emitted by a halogen lamp, is divided into several measuring and reference beams by means of a mirror-lens combination. The rays are led through a filter wheel to filter out the excessive spectral regions of the light. The remaining rays of the NIR region are projected onto the material to be measured.

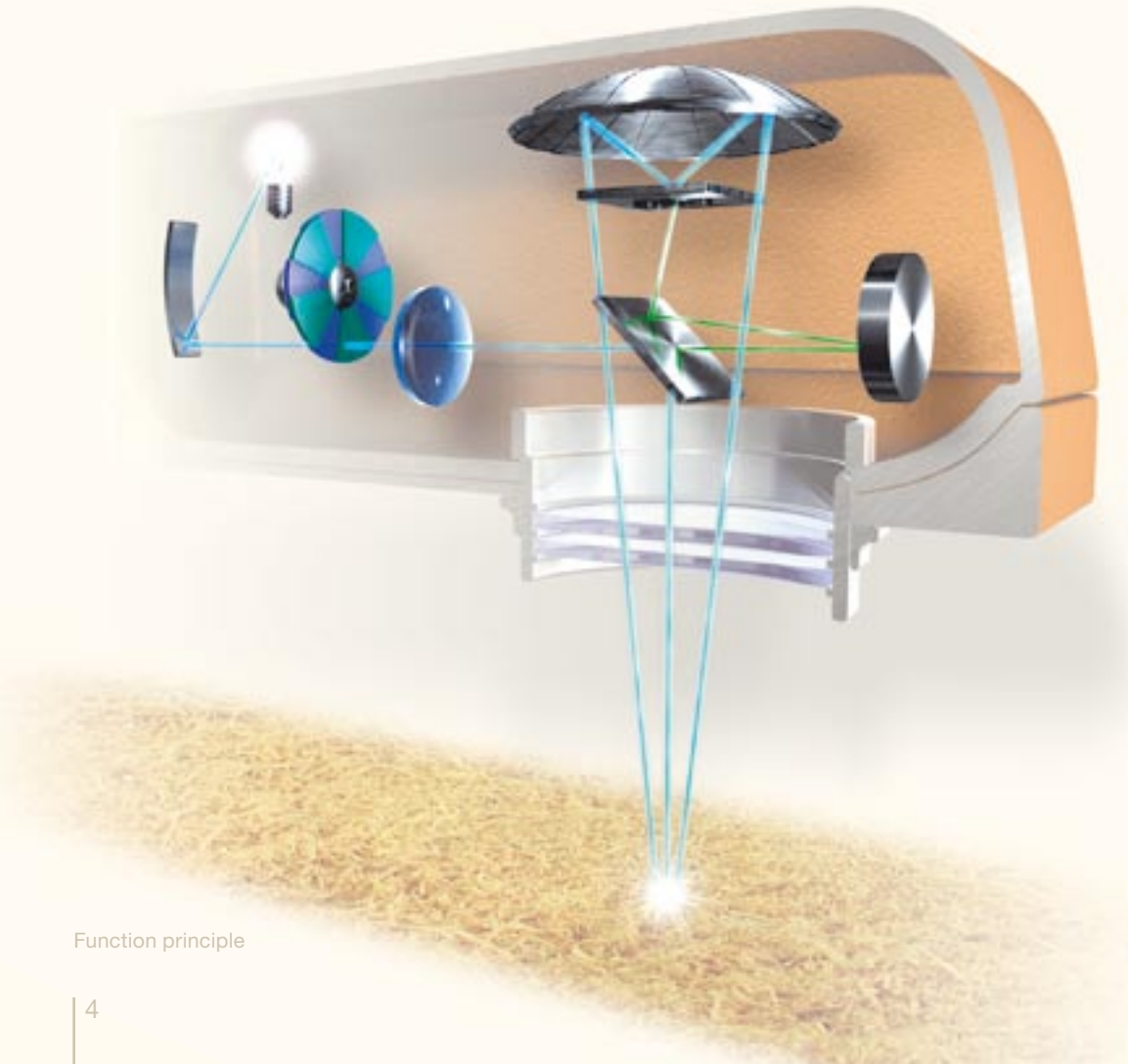
The reflected light, the intensity of which depends on the moisture content, is compared with the reference beams in the measuring head and used to calculate the material moisture. Due to the division into several measuring and reference beams and the dual-detector principle, a high system stability and measuring accuracy - independent of external influences - is ensured.

Network Connections

For the data transmission to higher-ranking process control systems, different interfaces, such as NET DDE, Allen Bradley Ethernet or Ethernet with TCP/IP or H1 BUS protocol, are available.

Online After-Sales Service

GreCon measuring systems are equipped with a modem, by means of which a direct connection to the GreCon after-sales service can be made. Support, changes in parameters, software updates and trouble shooting are all possible online.



Function principle

① Filling
of measuring device

② Taking
of samples and empty calibration

③ Emptying
of measuring device

Fibre Measuring Device FMV 3000 to Determine the Moisture in Drop Chutes

The fibre measuring device is especially suitable to determine the material moisture in drop chutes, such as drop chutes underneath dryer cyclones in MDF production processes.

The GreCon microwave moisture analyser IR 3000 WBPi is integrated in the FMV 3000.

With the FMV 3000, the fibres are collected and measured in a special collecting basin. After each measurement, a flap mechanism is opened, and the measured fibres are returned to the production process. At the same time, new fibres are taken and measurement starts again.

The FMV 3000 has an access port to the outside which makes the taking of samples and the zero-adjustment of the IR 3000 WBPi measuring system possible at any time (even during production).

This innovation gives you reliable moisture measurement directly after the dryer. A further advantage is the ability to check the measured results at any time.

Measuring Head

Housing dimensions: ..... 190 x 166 x 316 mm (W/H/D) / 7.5 x 6.6 x 12.4 in
Protection: ..... IP 65 (Nema 4)
Operational temperature range: ..... 0° C to +50° C *1 / 32° F to 122° F *1
Measuring ranges: ..... freely selectable, 0 to 5 %, 0 to 10 %, 5 to 20 % and 35 to 100 %
Measurement output: ..... % atro or % absolut
Measuring distance: ..... approx. 250 mm / 10 in
Max. material height fluctuation: ..... ± 100 mm / 4 in
Power supply: .....24 V DC from the operator interface

*1 with heating/cooling devices
-50° C to +100° C / -58° F to +212° F are possible (option)

Operator Interface

Housing dimensions: ..... 290 x 306 x 120 mm (W/H/D) 11.5 x 12.1 x 4.8 in
Protection: ..... IP 65 (Nema 4)
Operational temperature range: ..... 0° C to +45° C / 32° F to 113° F
Representation: ..... LCD touch screen
Analog outputs: ..... 1 output 4-20 mA
Relay outputs: ..... 2 high/low alarm relays (voltage-free)
Alarms isolated relay closure: ..... max. 1 A, 240 V
Serial interface: ..... RS 232
Product memory: ..... up to 80 product recipes
Power input: ..... 80 to 264 V universal
Frequency: ..... 50 Hz / 60 Hz
Power consumption: ..... 42 VA

Moisture measurement after the forming line

Forming belt,
belt scale or conveyor belt

Side wall
of dosing bin

Dryer

A combination of two IR 3000 WBPi is preferred in this position. With the measured product moisture before the dryer, the amount of material can be automatically regulated via the feed velocity. An overloaded dryer with material which is too wet can be prevented. At the dryer outlet, the moisture values are used to regulate the dryer to ensure constant product moisture, and to save energy through control of the drying process.

Blender

Similar to the drying process, two moisture analysers are used in the blender area. The automatic supply of glue and resin is regulated by the values measured at the inlet and outlet of the blender.

Gluing is optimised, which ensures the high strength properties of wood based material.

Forming Line

The use of a moisture analyser in or after the forming line gives final data about the spread chip or fibre mat. Automatic control of upstream processes of chip or fibre processing are possible.

References

- Fibreboard
- Gypsum board
- HDF board
- Hardboard
- OSB board
- Particleboard
- Wood cement
- Wet fibreboard
- Mineral fibre
- Poplar insulating board

Trough of
a screw conveyor

FMV in drop chute
underneath dryer cyclone

GreCon

Fagus Factory, constructed by Walter Gropius in 1911

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