MWF 3000

Online Moisture Measurement with Microwave Technology

GreCon®

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 perhaps slower production speeds will occur. If they are too dry, energy is wasted. The same applies to glued material.

Construction of the MWF 3000

Moisture analysers of the MWF 3000 series consist of a microprocessor-controlled evaluation unit and a planar sensor which are linked by two microwave cables.

The MWF 3000 works according to a precise resonator measuring principle. The measuring field of a microwave resonator is filled with material. The resulting moisture-dependent change in the natural frequency and half intensity width is measured and evaluated by using a patented method. The result is the density-independent moisture content of the sample.

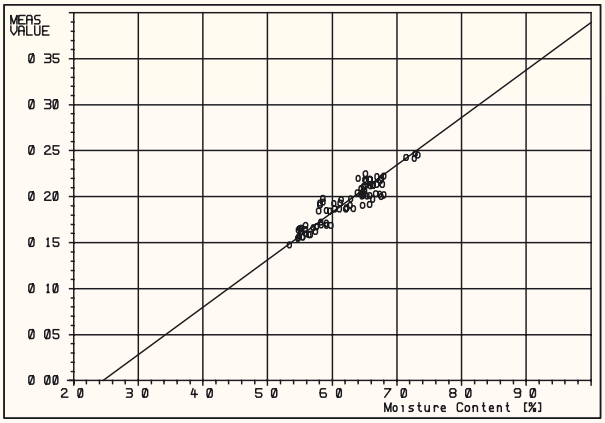
Optionally, the measuring system can be expanded to a density analyser. The material moisture and density are then determined simultaneously.

The moisture value is represented and stored, if desired. Up to 40 (optionally 200) different articles with the calibration curve and measured data can be stored in the battery-buffered memory of the system. The data can be copied to or from a connected PC with a backup function.

A password protects all or only individual data levels against unauthorised access. The system has user programmable analog outputs, control and alarm lines and two serial interfaces for the transmission of data to printers or computers.

Combination with other Measuring Systems

To make the evaluation of the product or material features easier, the MWF 3000 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. With joint evaluation of weight per unit area and moisture, the dry mass of the chip or fibre mat is automatically calculated.



Laboratory Microwave Measuring Station to Measure the Moisture of Wood Test Samples

For the production of MDF, HDF and OSB boards, the moisture content of the finished panel is an important quality feature.

Usually, the moisture must not exceed certain limits because escaping steam causes problems in later processes.

To control the quality of the finished panels, a test sample of 5 cm x 5 cm / 0.2 in x 0.2 in, sawn out of a finished panel, is measured in the laboratory.

The usual reference is the oven drying method (100° C to 106° C / 212° F to 223° F, 24 h).

In contrast to usual quick analysis methods, the integral panel moisture is determined.

Calibration is simple and done very quickly.

Advantages:

- Integral moisture (core moisture)
- Short measuring time of about 1 second
- Precise with an average deviation of < 0.2 %
- Independent of the panel thickness with only one calibration
- Variable sample thicknesses between 5 mm and 40 mm / 0.2 in and 1.6 in

Measurement is carried out in a sample magazine with a square inside diameter of 5.1 cm x 5.1 cm / 0.2 in x 0.2 in and a wall thickness of 1 mm / 0 .039 in.

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 MWF 3000 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 MWF 3000 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.

Technical Specifications

Measuring range: ..... 0.1 % to 85 %, depending on sensor type and product, selectable in subdomains
Repeating accuracy: .....0.05 % (standard deviation for tenfold measurement)
Measuring accuracy:.....± 2 %
Measuring time: ..... < 1 second
Product memory: .....20 products (optional 40 products)
Data security: ..... CMOS memories with backup batteries
Sample temperatures: .....0° to -70° C / 32° F to -94° F
Ambient temperatures: . -10° C to 40° C / -14° F to 104° F (with the system being switched on)
Options (on demand): ..... density measurement, remote operation terminal
Mains supply: ..... 110 V to 230 V AC, 50 Hz to 60 Hz, 70 VA

Evaluation unit:.....stainless steel housing
Protection:..... IP 55 (optional for ATEX zone)
Planar sensor: .....stainless steel housing with ceramic measuring surface
Protection:..... IP 65 (optional for ATEX zone)

Chute
after conveying element

FMV in drop chute
underneath dryer cyclone

Dryer

A combination of two MWF 3000 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.

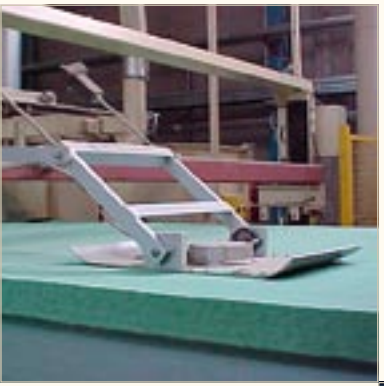
Gluing is optimised, which ensures the high strength properties of wood based material.

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



Sliding unit
on forming belt

Screw conveyor
or troughed chain conveyor

Side wall
of dosing bin

Laboratory
measurement

GreCon

Fagus Factory, constructed by Walter Gropius in 1911

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