CMC TEXPAN
Machinery and Technology

MICROWAVE (MW) AND NEAR-INFRARED (NIR) GAUGES

In-line control of raw material moisture and density supported by machine learning algorithms

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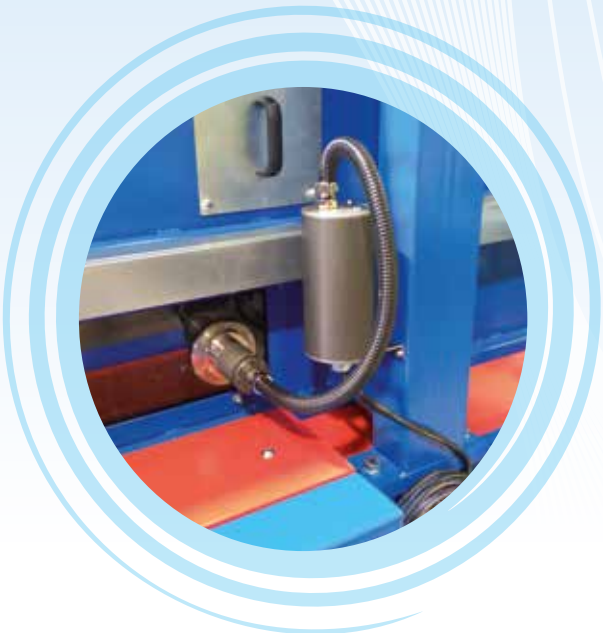
For the production of wood-based panels, the moisture content of the material being processed is of the utmost importance. Chips and fibers must be neither too wet nor too dry. If they are too wet, panel quality will worsen and production speed will get slower. On the other hand, an excessive dryness would involve a waste of energy: the same applies to glued material.

MW and NIR gauges represent a benchmark in industrial processes.
Thanks to the implementation of artificial intelligence and machine-learning algorithms, they make it possible to manage even complex automation problems.

They are suitable for different kind of wood-based products, such as particleboard, MDF, HDF, OSB etc. and can be used for moisture measurements both on wet and dry materials.



Microwave sensor for moisture and density measurement installed on particle metering bin for glue blender - detail

Glue blender metering bin - view of machine

Series mOisTori

MICROWAVE SENSING SOLUTION FOR BUNKER AND HOPPER

Installation on dryers:

Measuring product moisture before the dryer enables a convenient adjustment of the material throughput by acting on the feeding speed. The moisture values measured at dryer outlet, instead, can be used to regulate the dryer so as to keep product moisture constant, as well as to save energy by controlling the drying process.

Installation on screw conveyors:

This solution makes it possible to measure the moisture of the wood flow by means of a MW gauge.
The chip/fiber flow is controlled by a motor.

Advantages:

Avoidance of faults caused by wrong moisture;
- Measurement of chips/fibers inside bins/screw conveyors;
- Best accuracy of measured values thanks to machine-learning and AI algorithms;
- Pre-calibrated measuring system;
- Check of system stability through Auto Reference Standard (ARS).

TECHNICAL DATA

Measure parameters	
Moisture measurement range	0 ÷ 100 [%]
Absolute accuracy %;	± 0.2 [%]
Microwave penetration depth	from 0÷50 up to 0÷200 [mm]
Measurement time	from 0.3 up to 5 [s]
Moisture Repeatability	± 0.01 [%]
Operating temperature range	0 ÷ 80 [°C]
Sensor head materials (FDA approved)	Stainless steel, PTFE, PP and Al_2O_3
Operative parameters	
DC Supply / Power absorbed	24 [Vdc] @1[A]
Power generated by the sensor head	< 0.01 [mW]
Protection rating	IP66
Human Interface	
HMI (Human-Machine Interface)*	Panel PC - 8" or 10" touch screen
Sensors Dimensions	
Planar sensor head dimensions	Diam. from 42 to x 110 [mm]
Cylindrical sensor head dimensions	Diam. from 8 to 300 [mm]
Electronic case (standard) dimensions	270 x Diam. 120 [mm]

Above data are non-binding and they are provided for information purposes only.

Installation examples on PB plants

After GLUE BLENDING
Measurement of glued SURFACE and CORE Layers
Moisture range: 5% to 16%

After **DRYING** and **SCREENING**
Measurement of SURFACE and CORE Layers
Moisture range: 0.5% to 5%

After **MILLING**
Measurement of WET material
Moisture range: 10% to 90%

Series 710e

NEAR-INFRARED SENSING SOLUTION FOR MAT

710e gauges can be installed inside - or after - conveyor belts for continuous moisture measurement. Wherever precise product moisture is required, inline moisture analyzers will provide users with the necessary information. The continuous availability of product features will allow for an easy adjustment of the production process, so as to ensure high product quality standard.

For the production of wood-based panels, the moisture content of the material being processed is of the utmost importance. Chips and fibers must be neither too wet nor too dry. If they are too wet, panel quality will worsen and production speed will get slower. On the other hand, an excessive dryness would involve a waste of energy: the same applies to glued material.

COMBINATION WITH OTHER MEASURING SYSTEMS

For an easier evaluation of the product or material features, IR 710e sensors can be combined with Microwave mOisTori gauges. If then connected to the CMC-TEXPAN Weight Per Unit Area Gauge, a further evaluation of the material features will be possible. The dry mass of the chip or fiber mat can be calculated automatically basing on a joint evaluation of weight per unit area and moisture.

Advantages:

- IR filter for dry and wet chips/fibers included;
- Measuring head with dirt accumulation sensor;
- Fast-gating function included (gaps or interruptions in the material flow are detected);
- Reliable, drift-free moisture measurement;
- Online support via remote system.

TECHNICAL DATA

Measure parameters	
Housing dimensions	190 x 166 x 316 mm (W/H/D) / 7.5 x 6.6 x 12.4 in
Measuring accuracy	± 0,1 % (repeating accuracy)
Protection	IP65 (optional for ATEX zone)
Product temperature	+1 °C to +120 °C 33 °F to 248 °F
Ambient temperature	0 °C to +50 °C* 32 °F to 122 °F *
Measuring ranges	easily selectable 0 to 5 %, 0 to 10 %, 5 to 20 % and 35 to 100 %
Measurement output	% atro or % absolute
Measuring distance	approx. 250 mm
Max. material height fluctuation	± 100 mm / 4 in
Power	24 V DC

* with heating/cooling devices -30 °C to +70 °C / -22 °F to +158 °F are possible (options)

HMI	
Housing dimensions	290 x 306 x 120 mm (W/H/D) 11.5 x 12.1 x 4.8 in
Protection	IP65 (optional for ATEX zone)
Ambient temperature	0 °C to +50 °C* 32 °F to 122 °F *
Representation	LCD touch screen
Analog outputs	2 outputs 4 to 20 mA
Digital outputs	2 alarm outputs
Product memory	up to 80 product recipes
Power input	90 to 264 V universal
Frequency	47 Hz to 63 Hz
Power consumption	42 VA
Ethernet, Profibus, Profinet, DeviceNet, Modbus TCP, Ethernet IP	

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