



PROCESS

APPLICATION OVERVIEW



M-Sens

Online moisture
measurement
for solids

SYSTEM FEATURES

Areas of use

M-Sens 2 was developed specifically for permanent material moisture measurements of solids in continuous processes. M-Sens 2 is used for online moisture measurements

- in dusts, powders, granulates, wood chips and other bulk solids
- in various installation positions

Simple installation in all processes and straightforward calibration are two important benefits of the M-Sens 2 for daily process optimisation.

As the entire sensor is wear-resistant and watertight it is very reliable and will provide a long service life. As the material must always be in contact with the sensor, its measuring window is protected by a mixed ceramic screen which has a good load capacity in terms of wear and pressure.

With further development of the M-Sens sensor, the new moisture measurement sensor M-Sens 3 has been equipped with two additional features. It is possible to receive the material temperature continuously via a separate 4 - 20 mA output. With the integrated temperature measurement the user receives another important process parameter in real time, which is particularly interesting for drying, heating or cooling processes.

Furthermore the M-Sens 3 sensor also offers the function of flow detection. The new flow detection feature extends process reliability, especially when used in applications with materials that tend to cake. The new function immediately detects whether the material in front of the sensor is in motion. Only when material is moving it is ensured that not the same material sample is permanently measured, resulting in a falsified measurement value.

In addition, the M-Sens 3 issues an alarm as soon as no material flow occurs. For example, if there is no material flow through a screw conveyor anymore, this won't be seen by the process control system, but the M-Sens 3 generates an alarm as soon as material is no longer conveyed.

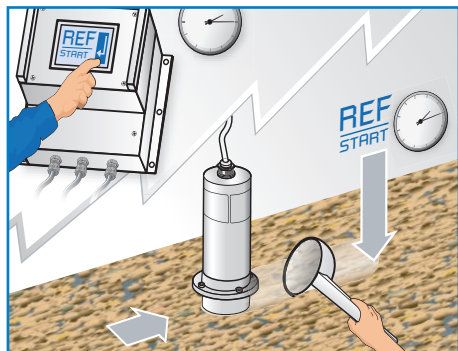
Function

The M-Sens sensor uses precise high frequency measurement and digitises the measurement values immediately to ensure high resolution.

Since the surface and capillary moisture of a material has a major influence on its dielectric constant, the moisture can be found accurately by recording the electromagnetic fields.

Fluctuations caused by temperature are automatically compensated by the sensor.

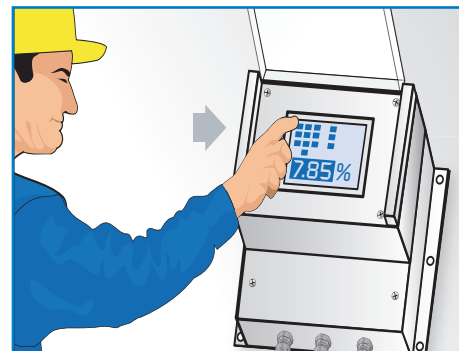
The system can easily be calibrated by the user. The calibration process takes place when the sensor is installed by entering the reference moisture content and pressing a button.



Remove the material sample

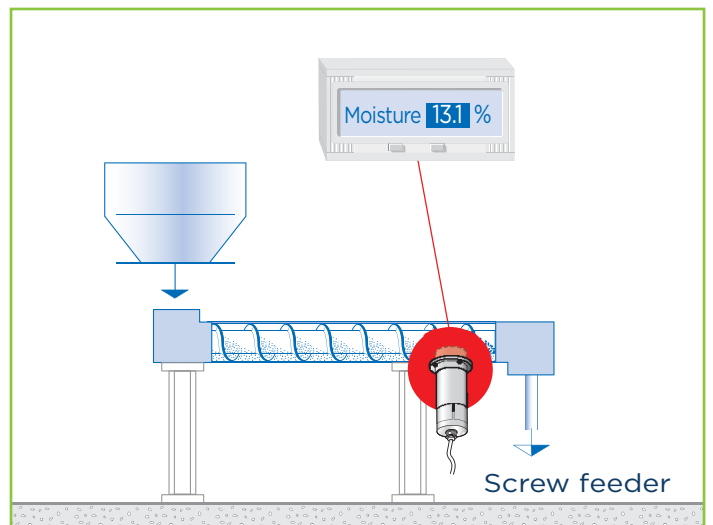
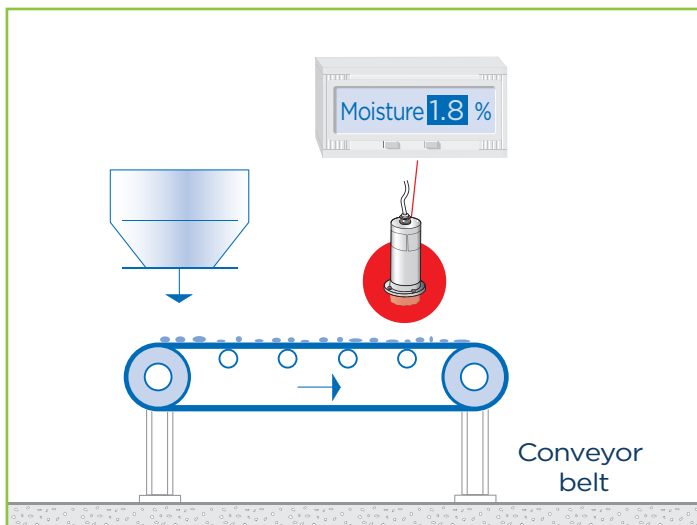
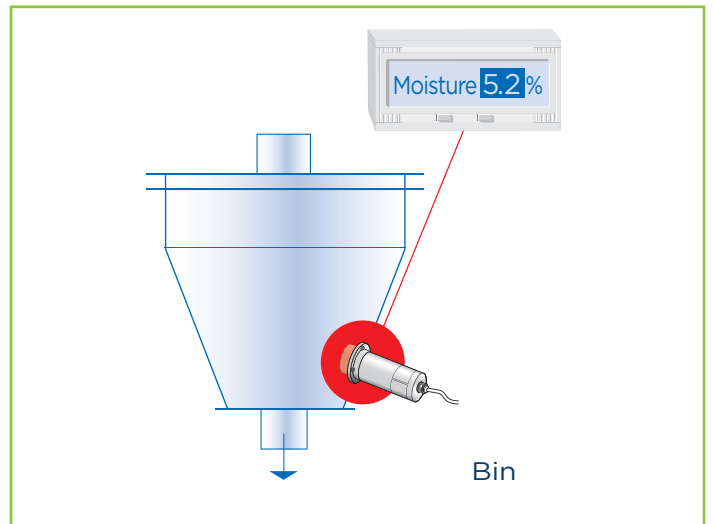
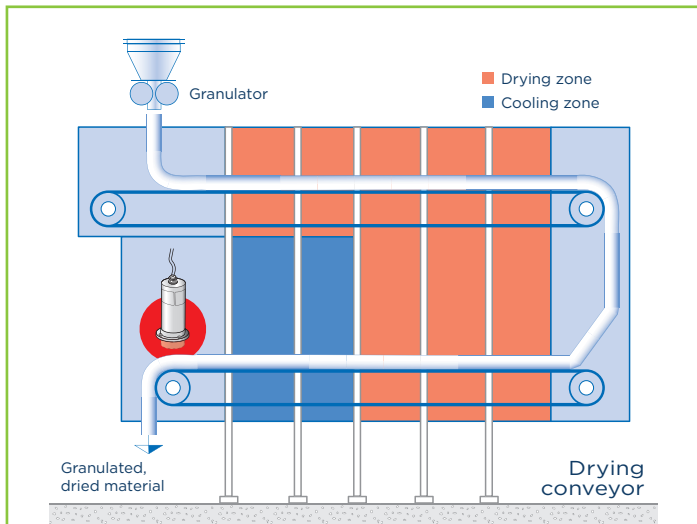
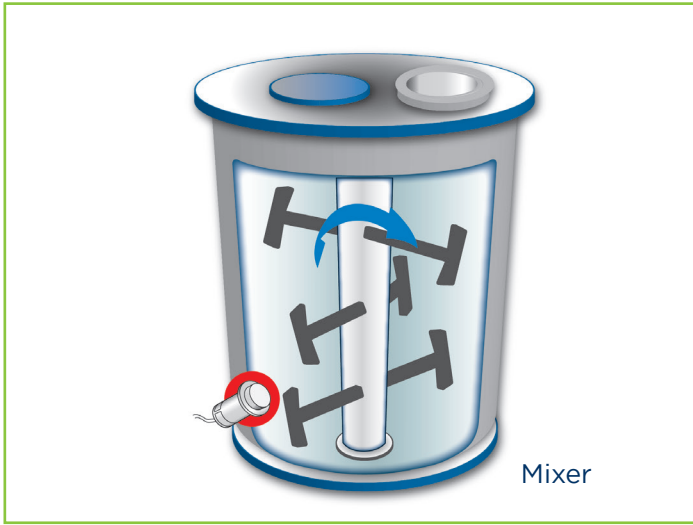


Determine the moisture in a laboratory



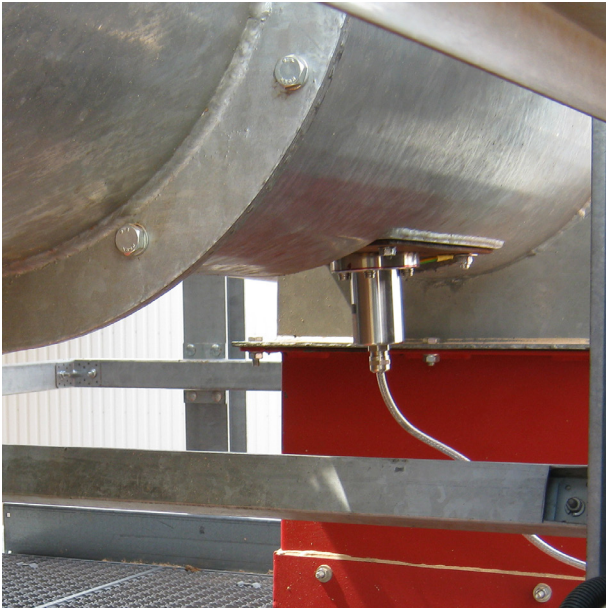
Assignment of the found moisture values to the sensor signal

POSSIBLE INSTALLATIONS FOR YOUR PROCESS



SOME EXAMPLES OF SUCCESSFUL APPLICATIONS

MOISTURE MEASUREMENT OF WOOD FLOUR



Customer:	Wooden pellet manufacturer (Germany)
Material:	Wood flour
Installation place:	Screw conveyor
Material moisture:	8 - 12 %
Customer benefits:	<ul style="list-style-type: none">• Better use of production capacity• If material with too high moisture content is blown into the silo, it may accumulate and become impossible to remove mechanically. In this case the silo has to be emptied using shovels.

MOISTURE MEASUREMENT OF TITANIUM OXIDE



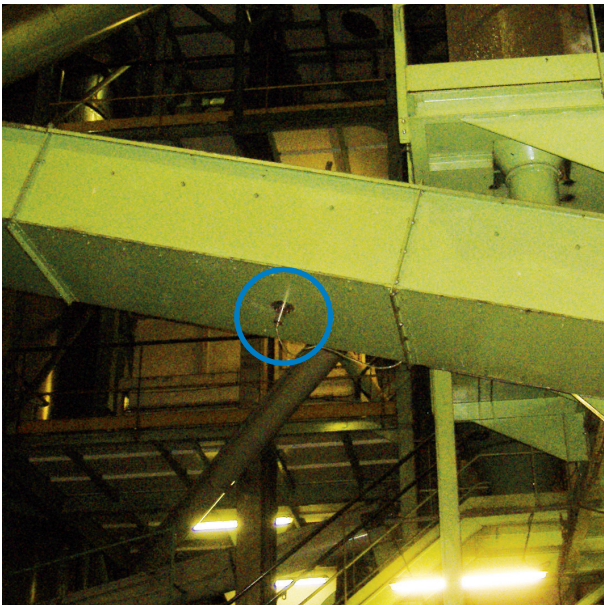
Customer:	Chemical manufacturer (Germany)
Material:	Titanium oxide
Installation place:	In a screw conveyor
Material moisture:	10 - 30 %
Customer benefits:	<ul style="list-style-type: none">• Improve the quality of the end product• Save energy by more efficient dryer control

MOISTURE MEASUREMENT OF SAND



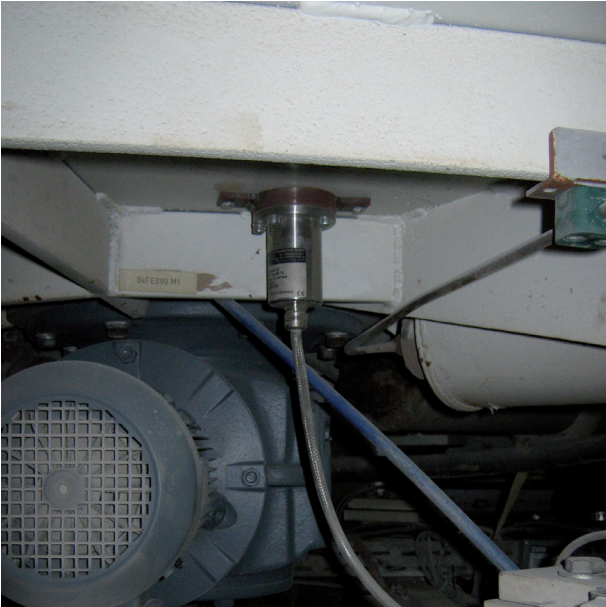
- Customer:** Asphalt manufacturer (Germany)
- Material:** Sand
- Installation place:** With a slide on the conveyor belt
- Material moisture:** 3 - 5 %
- Customer benefits:**
- Quality assurance during the manufacturing process

MOISTURE MEASUREMENT OF LUCERNE



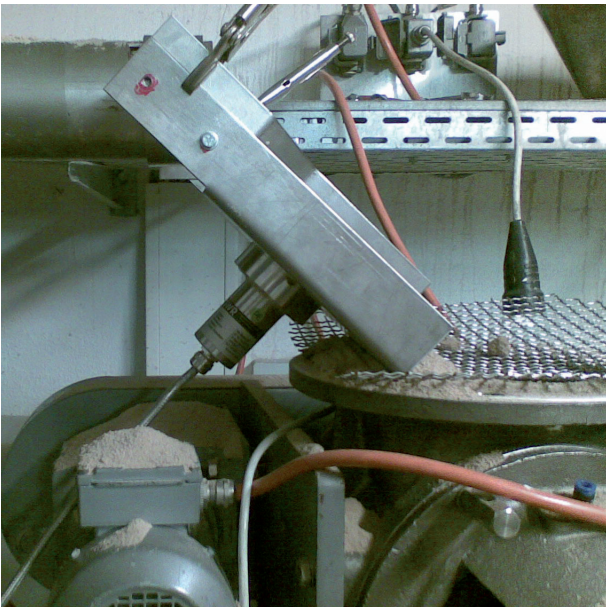
- Customer:** Animal feed manufacturer (France)
- Material:** Lucerne
- Installation place:** Downstream of the cooling system in a trough chain conveyor
- Material moisture:** 8 - 15 %
- Customer benefits:**
- Control the cooling system

MOISTURE MEASUREMENT OF WOOD CHIPS



- Customer:** Lime plant (Germany)
- Material:** Wood chips
- Installation place:** Below the silo (with integral mixer)
- Material moisture:** Approx. 8 %
- Customer benefits:**
- Enhancement of the combustion process: the lower the material moisture, the better the calorific value of the wood chips
 - The customer uses the moisture value to determine how much wood chip fuel he must feed into the furnace to achieve optimum efficiency.

MOISTURE MEASUREMENT OF POTATO POWDER



- Customer:** Animal feed manufacturer (France)
- Material:** Potato powder
- Installation place:** On a chute
- Material moisture:** 8 - 9 %
- Customer benefits:**
- Permanent assurance of the required material moisture for the manufacturing process with no loss of time as happened with the previous laboratory method.

MOISTURE MEASUREMENT OF ONION FLAKES



- Customer:** Food industry (France)
- Material:** Onion flakes
- Installation place:** On a screw conveyor at the output of the second dryer (2 dryers in line)
- Material moisture:** 1 - 10 %
- Customer benefits:**
- Replacement of an unsuccessful NIR measurement
 - Moisture measurement to pilot the dryer
 - Increase dryer efficiency and temperature measurement to insure product quality

MOISTURE MEASUREMENT OF COAL POWDER

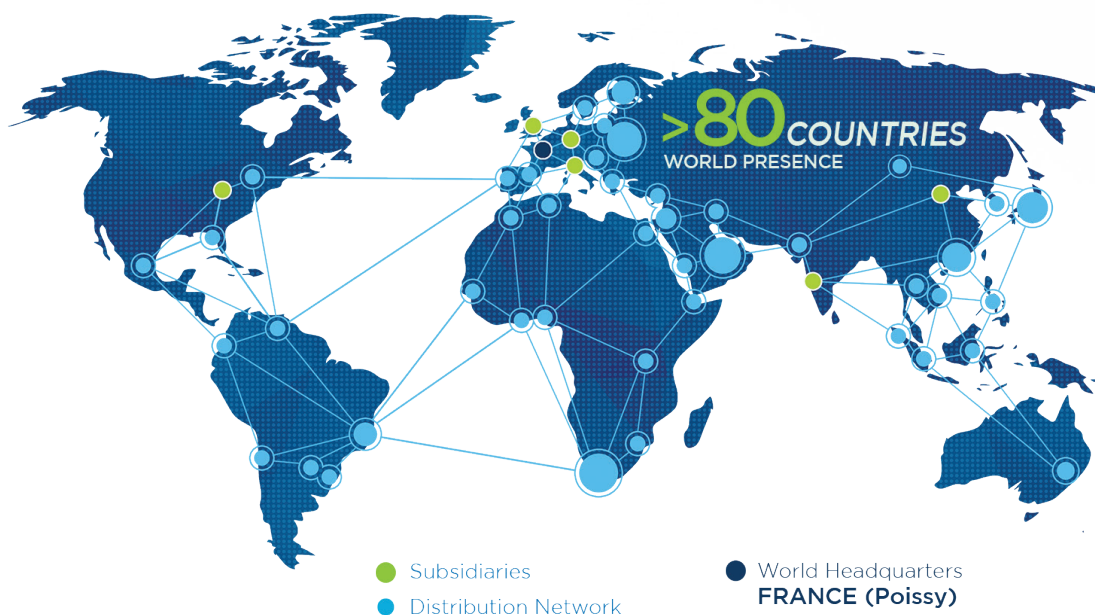


- Customer:** Steelworks (Brazil)
- Material:** Coal powder
- Installation place:** In a screw conveyor
- Material moisture:** Approx. 2 %
- Customer benefits:**
- Control coal consumption (if the coals moisture is too high the firing capacity is lower)
 - Helps to find the perfect volume of coal for the best possible firing process
 - The online measurement enables the efficient of the furnace to be improved

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