



# MoistTech's Online NIR Moisture Sensor for the Converting Industry

## IR-3000C SERIES WIDE RANGE OF APPLICATIONS INCLUDE:

- |                   |              |             |              |                                     |
|-------------------|--------------|-------------|--------------|-------------------------------------|
| ✓ Adhesives       | ✓ Coating    | ✓ Film      | ✓ Laminates  | ✓ Paper                             |
| ✓ Abrasives       | ✓ Converting | ✓ Foils     | ✓ Labels and | ✓ PVB & PVC                         |
| ✓ Battery Coating | ✓ Corrugated | ✓ Glue      | ✓ Tape       | ✓ Polypropylene<br>and Polyethylene |
| ✓ Board           | ✓ Extrusion  | ✓ Hot Melts | ✓ Nonwovens  | ✓ Thickness                         |

In addition to measuring moisture the 3000 Series may be used to measure, display and control coating weight, sheet and film thickness and other elements that absorb NIR.

### PRODUCT INFORMATION

MoistTech developed the IR3000-C Series online NIR sensor for instant, non-contact measurement of the Converting and Paper Industry in the most demanding manufacturing environments.

Often converting process efficiency is affected by variations in coat weight, inefficient moisture control, thickness and/or temperature issues. MoistTech has been involved in the Converting and Paper Industry for more than 40 years creating tailored customer solutions that address their concerns. The 3000C Series provides continuous, reliable readings and is a one-time calibration, maintenance free, drift free optical design allowing for immediate process adjustments based on real-time measurements.

The IR3000C Series uses state-of-the-art components allowing installation in the most extreme locations. As result of MoistTech's advanced digital processing, only the IR3000C Series provides true data for all of your converting applications.

### NEAR INFRARED (NIR) TECHNOLOGY

All molecular bonds absorb specific wavelengths of light. Hydrogen bonds including O-H (water); C-H (hydrocarbon) and N-H (ammonia) all absorb strongly in the NIR spectral region. The amount of NIR energy reflected at a given wavelength is inversely proportional to the quantity of absorbing molecules in a product.

The NIR technique is a non-contact, non-destructive measurement. MoistTech's sensor utilizes multiple wavelengths of NIR light, projected onto the product at a very high repetition rate. The reflected light is then measured using a digitally enhanced detection system and thousands of data points are sampled every second.

### INSTALLATION LOCATIONS

The sensors can be installed using the bracket on the back/top of the sensor 4" - 16" (inches) from the product. The MoistTech sensor has many options for installation including:

- Systems
- Winders / Unwinders
- Dryer In/Out
- Webs
- Pipeline or Pneumatic Conveying using our Flange window or Sampler options.

### DISPLAY OPTIONS

In addition to the MoistTech management software, MoistTech offers several read-out options to display and/or adjust the measurement outputs.

- Digital Panel Meter (DPM) connected by 4-20mA output
- Full Color Touch Operator Panel (OP-14) PLC based connected by RS-232C serial. (provides trending graph)
- Color Touch Operator Interface (OI) connected by Ethernet.

(OP-14 & OI provide operators & engineers the unlimited ability to make changes to gauge parameters, monitor diagnostics and program calibrations all at-line)

### KEY BENEFITS FOR USERS:

#### **Reduce Edge Control & Lay Flat**

Uniform Web Profile

#### **Process Optimization**

Maintenance Free

#### **Fuel Consumption Savings**

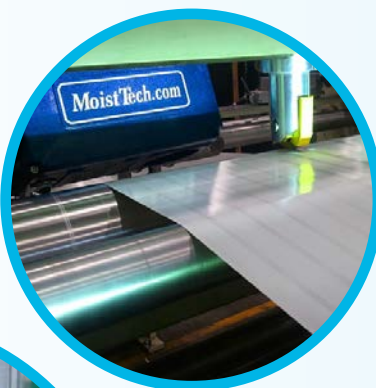
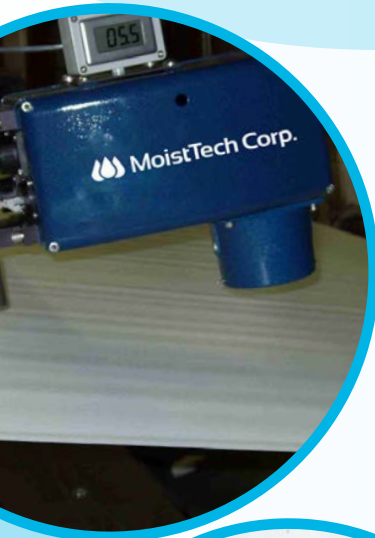
Process can be controlled resulting in a reduction in energy consumption

#### **Non-Nuclear**

Non-Contact  
Single-Sided

#### **High Accuracy Proven**

Immediate Line Adjustments



# Common Online Applications

# Common Online Applications



## PAPER AND BOARD

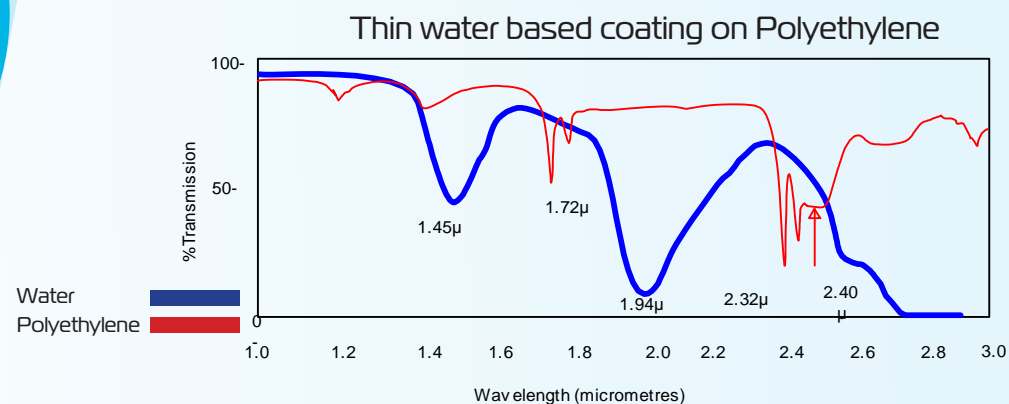
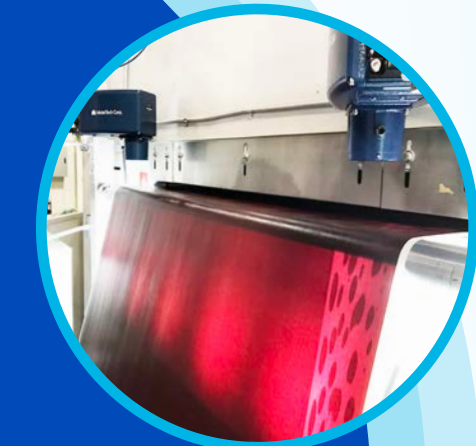
All paper contains some moisture since it is composed of cellulose fibers. This normal moisture content will generally range between 2% and 10% depending on the type of paper, its past moisture history and the atmospheric conditions to which it is exposed. When subjected to extreme conditions the moisture content of a paper may range from as low as 0.5% to as high as 13%. Many basic properties of paper are greatly affected by its moisture content. Paper dimensions, flatness, conductivity, strength and fold are among the more significant properties influenced by its moisture content. These paper properties can be very critical to the proper performance of paper and therefore, effective control of paper moisture level and moisture uniformity is essential for efficient printing and converting operations.

## TEXTILE COATING & NONWOVENS

The MoistTech principle of Infrared absorption measures Polymer and Moisture in geotextile lines, diaper components, filter media, household wipes and many other nonwovens. MoistTech manufactures a quality control system tailored for your specific application, for your specific measurement and control needs. Fixed, single-sided sensor are available measuring tandem coatings, basis weight, moisture and thickness.

## REMOISTURIZING

The MoistTech NIR sensors allow for fully automatic moisture profile control for virtually any moisturizing/decurling application. Customers choose from many systems configured for narrow web and wide web applications and a diversity of materials including paper and paperboard, silicone release liner, laminations, carrier board, ink jet/laser jet papers, printed labels, and metalized papers. By using our online moisture sensors, feedback loops ensure predictable and repeatable results, even at high operating speeds.



## COATING/LAMINATING/CONVERTING/FILM/POLYMER/LABEL

Online coating and online converting measurement is a key component in the process. Allow MoistTech to help your measuring basis weight on coated board, thickness of coatings and films, moisture and coating all on one sensor. A complete range of applications can be measured for moisture, thickness and basis weight of clear, pigmented, extruded products. Edge curl and lay flat issues are also a problem in the label and converting industry. Uneven moisture stratification can cause shrinkage or expansion of cellulose fibers. Curled stock is a problem for printing and packaging. Coatings can also get thinner or thicker at the edges. Our fixed position NIR transmitters greatly help to reduce curl or coating issues and improve process control operation.

## CORRUGATED BOARD (Warp Control, Breakage, Collapse and Flute-exposure)

During production of corrugated boards, many problems are caused by inaccurate control of moisture, whether by higher (leading to collapse, flute-exposure), lower moisture (leading to board breaking) or different top/bottom moisture (leading to warp). Moisture control is a crucial issue in production and procession of corrugated boards. Too much water-content would cause boards to soften and submit to collapse and flute exposure after being produced. However, not enough water would make them to be crisp and easy to breakdown. Different moisture content in the top side vs bottom side causes warp issues. Therefore, only by strict control of moisture, operators can produce high-quality boards and boxes, but moisture control is a complex process affected by many elements.

## HOT MELTS / GLUES

Hot Melts are commonly Paraffin Wax coatings. Roll Coaters, Die Coaters, extruders, and doctor blade configurations are among the methods of applying hot melt adhesive. Roll coaters offer more flexibility than die application methods. Die Coaters offer more precision across the web and Hot melt applications are very common. Pressure sensitive adhesives are a unique form of adhesive that are permanently tacky at room temperature. They adhere to substrates under pressure via polar attractive forces rather than forming chemical bonds. There are three distinct ways of applying PSAs: In solvent, As hot melt and Emulsion based.



# Display Options

# Instant, Non-Contact



## OP-14 OPERATOR PANEL

OP-14 Operator Panel is PLC based separately mounted unit communicates with the MoistTech sensors through RS-232C Cable. Large numerical display and full screen trend display. Online control, calibration and measurement display for all 3000 series sensors. Rated IP-67 dust - water tight.



## OIU OPERATOR INTERFACE UNIT

OIU Operator Interface Unit is separately mounted unit communicates with the MoistTech sensors through Ethernet cable. Large numerical display provides online control, calibration and measurement display for all 3000 series sensors. A flat panel PC uses the Windows CE operating system and color LCD touch panel screen for interface to the connected sensor. Rated IP-65 NEMA 4.



## REMOTE DIGITAL PANEL METER DPM2-UDM

Remote Digital Panel Meter DPM2-UDM uses the 4-20mA output to display a local 3.5" digital display. Sealed for wash-down protection and dust tight. Front-side tactile-touch buttons provide programing input to set up the DPM. LED numerical characters.

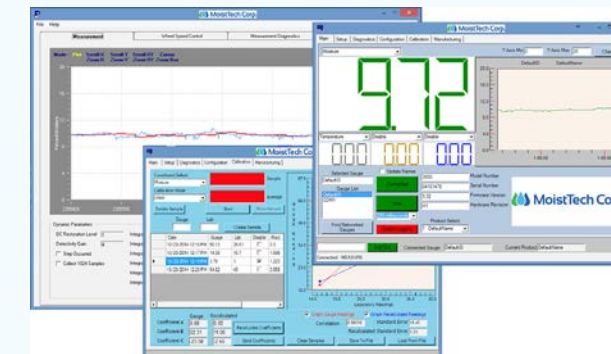


## M\_KONNECT MULTIFUNCTION DISPLAY UNIT

M\_Konnect Multifunction Display Unit communicates through the internal RS232 Serial communication and is capable of displaying up to 3 simultaneous measurements from the one connected sensor. It has a sampling function calculated the average value and standard deviation for accurate cross checking against laboratory methods.

## MOISTTECH PC SOFTWARE

MoistTech has designed a suite of high-tech Windows™ programs to provide user-friendly interfaces for configuration, data logging and monitoring of diagnostics. Our configuration software supplies the operator with the capability to monitor up to three constituents and the addition of the temperature option. Output trending is displayed to take corrective action prior to reaching determined thresholds. With this you can perform calibrations, define gauge and measurement parameters and set-up and configure up to 50 different product codes. The MoistTech Software package is easy to use and compatible with any PC platform.



## TYPICAL INSTALLATIONS

The MoistTech 3000 series sensors can be installed in many configurations using the bracket on the back or top of the sensor enclosure. Most typical installations are mounted 4" - 16" from to product flow to be measured. Changes in product flow can be compensated for using our filtering, damping and averaging.

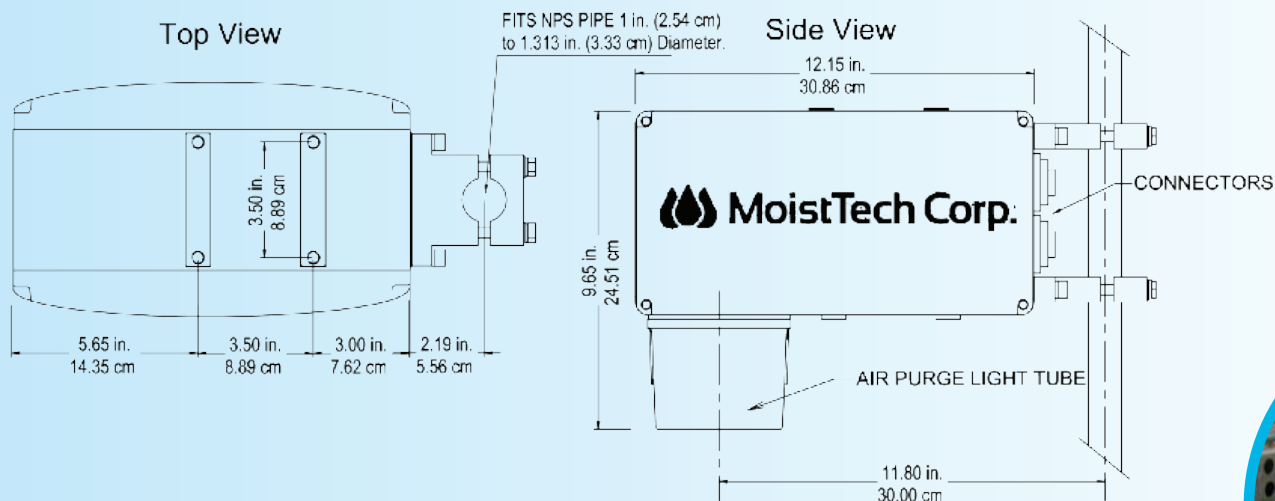
- After coating station applying water based coatings, either on paper or film
- After dryer to measure organic coating coat weight
- After extrusion in the case of hot melt or polymer
- Exit & Inlet dryer moisture and temperature
- Moisturizing units e.g. LAS, steam curtains before and after chill rolls
- Moisture profile measurement and correction e.g. before steam profilers, before and after water jet micro sprays, before and after segmented infrared drying



## OPTIONS & ACCESSORIES

In addition to the Display Options listed, MoistTech offers many installation options & accessories:

- Air or Water Cooling Cover for high temperature with optional auto on/off solenoid
- Product Loss Sample Hold Sensor
- Product Temperature Pyrometer



## SENSOR SPECIFICATIONS

Measured NIR Constituents:  
Moisture Ranges:

1, 2 or 3  
0–0.1%, 0–100% PPM Ranges Subject to Application

Accuracy (subject to application):  
Repeatability:  
Optical Measurement Distance:  
Sampling Size:  
Calibration Codes:  
Enclosure:

±0.01%  
±0.01%  
4–16 in (10–40 cm)  
Approximately 1.5-in (3.7 cm) diameter on sample  
50 Standard  
Cast Aluminum, IP65 (NEMA 4) & Optional IP67  
Stainless

Power:  
Operating Temperature:

80–260 VAC (50/60 HZ), Optional 24VDC  
0–130°F (0–55°C)  
Vortec Cooling (High Temp): Max 170°F (85°C)  
Stainless Steel IP67: Max 200F (93C)

Calibration:

Factory Pre-Calibrated, PC Calibration software included, Routine re-calibration is not required  
None

Ambient Light Sensitivity:  
Sensor Input/Outputs:

Three self-powered isolated 4–20mA outputs,  
RS-232/485, Ethernet TCP/IP  
Profibus, Profinet, DeviceNet, Ethernet IP

Optional interfaces:

\*Above specifications are subject to application

