IG710S and SR710S Sensors

NIR Measurement Technology for the Coating and Converting Industries

Applications:

- PSA labelstock coating
- Tapes
- Coated paper and film
- Laminates
- Thermal lamination films
- Solar films
- PVDC coating
- Laquer on aluminum foil
- Flexible packaging
- Industrial packaging
- Silicon release liners
- Poly coating
- Steel and aluminum coating

Features:

- **IG710S: A versatile IR gauge for the measurement of moisture, coat weight or coating/laminate thickness on a wide range of paper, board and film-based substrates**
- **SR710S: Specifically engineered for measuring thin coatings on metal foils, steel coils, metalized paper or plastics using a unique patented design**

The IG710S and SR710S non-contacting precision infrared gauges provide high-resolution measurements of coatings, laminates and moisture. Both gauges represent a non-nuclear solution and do not require special licensing or protection guards. These gauges combine high-speed measurement performance with accuracy to achieve robust, reliable measurements on a fast-moving web. Their selective infrared technologies enable either fixed-point or scanning coat weight measurement without the need for the extra hardware required by subtractive methods.

With a 7.5 millisecond measurement speed (up to 10 times faster than other IR gauges), their patented design achieves improved resolution, speed and accuracy. When incorporated into an NDC TDi web gauging system, they provide the industry's best cross-web and machine direction profiling performance, for superior quality and productivity.

Both the IG710S and SR710S gauges are engineered to be unaffected by changes in process and ambient conditions such as:

- Lighting fluctuations
- Temperature
- Relative humidity
- Air quality: Dust, evaporates content etc.
- Web flutter

This also includes subtle changes that can occur within the substrates from batch to batch.

IG710S

A versatile IR backscatter gauge

for measuring coatings, laminates and moisture on a wide range of substrates

IG710S

The IG710S delivers cost-effective measurement solutions through its ability to use selective NIR wavelengths to measure key value-added coatings and moisture content in converted products.

Pre-calibrated Delivery

The IG710S is delivered pre-calibrated for each application and is highly tolerant to the changing conditions found in the converting industry. This gauge combines low cost of ownership with long-term stability without the need for re-calibration, systematic monitoring or correction for drift.

Unique Optical Design

The gauge's patented optics are able to tolerate web flutter of the order of ± 50mm (± 2.0ins) and the robust NDC measurement algorithms provided with each application mean that it is insensitive to within-product variations such as color and basis weight. Gauge adjustments, when required, are very straightforward compared to other gauges offering similar technologies.

Measurement Capabilities

The IG710S has extensive and versatile measurement capabilities, including:

- Moisture in paper, textiles and nonwovens
- Water-based coatings and other organic coatings on paper
- Extruded or laminated polymers on paper or board
- Clear and pigmented coatings

Applications

With its flexible measurement capabilities, the IG710S can be used across a wide range of applications, including the following types of coatings:

- Water or solvent-based
- Solvent-less
- Wax dip
- Impregnation
- Polymer extrusions
- Barrier coatings
- Lacquers
- Hot melt

NDC TDi Systems: Delivering the process visibility and control required to provide greater production, quality and process efficiency.

NDC's "Total Distributed Intelligence" Systems use a robust, easy-to-install architecture with minimal hardware that is reliable easy to maintain.

As part of the TDi System the IG710S and SR710S function as "i-Sensors". These are "smart" devices with the signal processing carried out in each gauge's high-speed embedded processor prior to the operator consoles and control devices on the network.

The same is true for the scanning frames, such that when position data from a scanning frame is combined with measurement data from a sensor, the resulting profile accurately represents the position of streaks and cross-machine control zones.

This provides reliable data for effective process control for a fast return on investment from the system.

SR710S

Incorporates a unique patented design specifically engineered for measuring thin coatings on metals and metalized substrates

High-Precision Performance

The SR710S delivers exceptional measurement precision of thin organic coatings on metals and metalized substrates. These coatings may be just a few microns (or mils) thick, but the combination of more intense mid-IR wavelengths plus the high-sensitivity detector used in the SR710S, means the gauge can accurately measure down to 0.1 microns, while remaining unaffected by changing ambient and process conditions.

Cost-Effective Measurement

The SR710S is able to accurately measure very thin, high value-added coatings that have been difficult to gauge with alternative technologies. The combination of its compact form factor, performance and ability to measure coatings directly, make it significantly more cost effective than alternative measurement technologies; for example multi-scanner X-ray or beta gauge configurations that employ subtractive techniques to calculate the coat weight.

NDC710S and SR710S Advantages

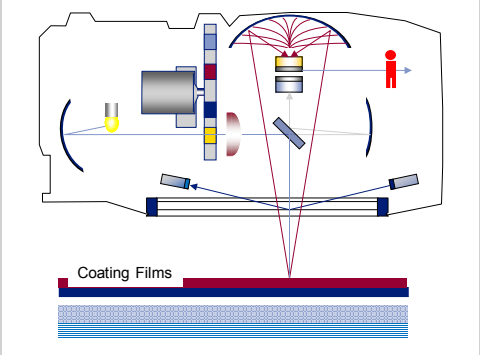
Both gauges can be installed on NDC's MiniTrak-S scanners and integrated into an NDC 8000 TDi System. These platforms include operator display and control options that provide tangible financial cost, quality and productivity benefits. These systems are configured specifically for each application and are able to deliver a range of benefits including:

- Reduced product change and start-up times
- Tight machine-direction and cross-direction coating thickness control
- Reduced raw material consumption
- Reduced drying costs
- Enhanced product quality and consistency

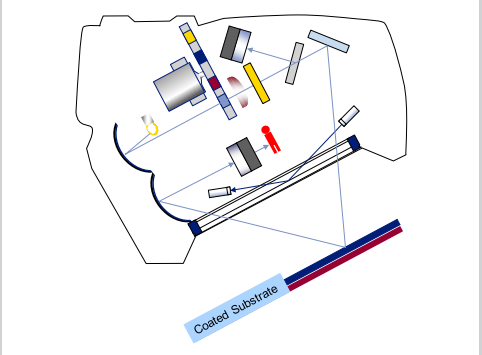
Measurement Techniques

The NDC710S and SR710S gauges operate on the principle that water and organic products, such as coatings, absorb near-infrared light (NIR) at specific wavelengths. When exposed to this NIR light, a product will absorb a proportion of this energy depending upon the active constituent that is present.

The gauges generate and emit specific wavelengths using rotating optical filters to transform the energy from a quartz halide (QH) lamp into sequential pulses of NIR light at the desired wavelengths. The reflected light is captured by a special mirror and focussed onto a light-sensitive detector. Before leaving the gauge, a beam splitter diverts a portion of the beam to the secondary detector, to form the reference signal against which the light will be compared.



The difference between the IG710S and the SR710S relates to the substrates they are able to measure. The IG710S captures diffuse-reflected energy, while the SR710S makes use of the reflectivity of metallic substrates to direct infrared energy through the coating.



Technical Specifications

Parameter	IG710S	SR710S
Measurement capabilities	- Moisture in paper (40g/m2-150g/m2) basis weight: 0-12% - Adhesives and other organic coatings - Water-based coatings on paper and films - Resin coatings - Extruded coatings on paper and board	- Thin organic coatings on foils - Wax or lubricant on steel - Adhesives on aluminum foil or metallized papers - Lacquers on metals/metallized substrates - Extruded polymers on metals - Organic based coating on steel
Gauge to product distance	200mm (8 inches)	28mm (1.1ins)
Accuracy (Indicative; see NDC for application-specific accuracy values)	±0.10% : Moisture 0-12% ±0.20g/m2: Coatings up to 50g/m2 ±0.50g/m2: Coatings 50g/m2 up to 500g/m2	±0.05g/m2: Coatings up to 2g/m2 ±0.10g/m2: Coatings up to 5g/m2 ±0.20g/m2: Coatings 2g/m2 up to 20g/m2 ±0.30g/m2: Coatings 10g/m2 to 40g/m2
Repeatability	±0.10µ 2-sigma over 48hrs	±0.01µ 2-sigma over 48hrs
Product pass height tolerance	±50mm (±2 inches)	±5mm (±0.2ins)
Beam spot size	25mm (1 inch) circular 10mm (0.4ins)- square (optional)	30mm x 15mm (1.2ins x 0.6ins eliptical)
Response time	Up to 7.5 milliseconds based on application	
Calibration	SpeedCalTM pre-calibrated. No routine re-calibration required	
Reliability	Sensor MTBF of 10yrs Lamp and motor have 5yr warranty	
Network connectivity	Industrial Ethernet	
Electrical	Power 24V at 42 Watts CE compliant to low Wattage directive eurostandard: EN61010-01 and for electro-magnetic compatibility: EN50081-1 & EN50082-2	
Environmental	Ambient temperature: Up to 50oC (Cooling optional) Cast alloy sensor housing	
Maintenance	No routine maintenance is required Active diagnostics and integral window contamination monitor included	

NDC Technologies is represented in over 60 countries worldwide. **www.ndc.com**

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