



WE CRAFT ASSURANCE



Biaxially Oriented Polypropylene (BOPP) Film

APPLICATION NOTE

Biaxially-orientated film is used to manufacture shrink wrap and barrier type films. It is essentially stretched in two directions—machine and transverse direction. The stretching allows for the alignment of the polymer molecules to improve physical properties. When manufactured, bi-oriented films have typical shrinkage in the 20 to 60 percent range dependent on formulation, label wraps, tapes, capacitance films and many other applications.



Specific films of this nature are Biaxially Orientated Polypropylene (BOPP), Biaxially Orientated Polyethylene Terephthalate (BOPET/polyester) and Biaxially Orientated Polyamide (BOPA/nylon). BOPP film is used in snack, pasta and other packaging applications including the overwrap for multi-packs. BOPP is typically 15 to 30 microns thick, but can be as thick as 50 microns. Water-based acrylic and polyvinylidene dichloride (PVDC) coatings are often applied to increase moisture and odor barrier levels, as well as sealing properties.

SUMMARY OF THE PROCESS

The film is coated with acrylic, PVDC, or other coatings for moisture, odor and other film barriers that can be measured with Near Infrared (NIR) technology on the wet end to optimize coat weight across the web profile.

QUALITY PARAMETERS AND MEASURING POINTS

Cost, regulation, standardization, and maintenance are moving the measurement preference from nuclear to NIR. The wax is a strong NIR absorber. Essentially, the NIR transmitter measures the water-based carrier solution based upon a constant liquid to solid ratio per product and supplies an engineering output in #/ream, mils, GSM or other.

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The MCT560 series of NIR stand-alone sensors are usually mounted in the center of the web or in series on the left, right and center of the web. This is of great value to the converter. The Guardian-HD Web Profiling Series supplies a cross direction zoned web profile and machine direction trend for system operation. The color-coded profile visually displays in-spec product as green zones, alerts in yellow and red alarms. This is often connected to a color-coded stack light with annunciator to alert operator when product is in the alarm condition. Machine direction trends allows troublesome zones to be diagnosed and corrected.

The Guardian-HD system or MCT560 Series stand-alone sensor are usually mounted on the wet end at an angle of 18 degrees to the perpendicular and 15-40 centimeters (6–16 inches) from the web. The system is calibrated in engineering units such as GSM or mils thickness based on the fixed liquid solids ratio of the coating.

VALUE AND QUALITY

Implementation of NIR technology to measure coatings on BOPP improves speeds of startup, increases production, reduces scrap and allows for data archiving by roll or run. Without an on-line measurement system, the line must be started up, the sample collected for laboratory analysis, system optimized, and started up again with another sample collected to confirm the optimization. With an on-line system, this process is streamlined, resulting in much greater efficiency. The data archiving, whether from fixed or scanning sensors, via Ethernet communications, protects against customer complaints and allows data histories to be associated with modifications to unit operations or work shifts.



[Scan here to learn more about the Guardian-HD Web Profiling Series Analyzer](#)



The Guardian-HD Web Profiling Series is a rugged and world-class analyzer to measure moisture, coat weight, adhesive thickness, and web temperature for all paper, film, and web-converting processes.

GUARDIAN-HD WEB PROFILING SERIES ANALYZER

- Rugged, sealed industrial frame and linear actuator withstands hot and humid environments common with paper and converting processes
- Automatic edge detection senses roll width to streamline set-up processes, and realigns to accommodate web drift
- Configurations available to monitor and control multiple Guardian-HD systems simultaneously
- Easily connect to closed-loop control systems or local alarms

GUARDIAN-HD NIR MEASUREMENTS

Moisture Range:	Min 0.1%, Max 95%
Coatings Range:	Min 0.1 GSM, Max 250 GSM
Moisture Accuracy:	±0.1%
Coatings Accuracy:	±0.1 gr/m
Repeatability:	±0.1%

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