

THERMO SCIENTIFIC SPECTRABEAM-HR™ TRANSMISSION PRODUCT IRS00-XX

The Thermo Scientific SpectraBeam-HR Full Spectrum Infrared (FSIR) Sensor provides a high resolution online measurement of web composition. The intelligent scanning sensor is suitable for multi-component discrimination and chemical analysis of moving webs including plastics, coated products, paper, nonwovens, and composite materials. Among the measurements performed by the transmission configuration are coextrusion layer discrimination, moisture, binder concentration, and fiber blend.

SpectraBeam-HR analyzes infrared absorption exhibited by components in the web. The unique FSIR technology analyzes the full spectrum, rather than just a few pre-selected wavelengths as in conventional IR sensor designs. Full spectral analysis, coupled with an extended infrared range, allows accurate measurements of components and properties that were not previously available online.

SpectraBeam-HR offers high performance without compromising flexibility. Additional product measurements are implemented by simply introducing new calibration data to the software library. Software calibration, rather than changing hardware filters applied in conventional IR devices, ensures that the SpectraBeam-HR technology can be adapted to evolving product and process requirements.

This enhanced high-resolution design incorporates improved optics that provides 3 times better streak resolution. This aids in die control and provides higher detail layer distribution analysis.



Dual Thermo Scientific FSIR Sensors Shown

MEASUREMENT LIBRARY INCLUDES

- Weight or thickness of most commodity, engineering, and barrier resins in complex coextruded films and light sheet, including PE, PP, PS, Nylon, EVOH, PET, Ionomer, Ethylene copolymers, and adhesive resins
- Discrimination of chemically similar materials in complex applications
- Measurement of coatings and laminations of lightweight materials
- Moisture measurements on a variety of lightweight substrates
- Fiber blend, binder and surfactant measurement in nonwoven fabrics
- Binder and LOI measurement in fiberglass mat
- High resolution and accurate measurement of lightweight materials where nuclear gauges are unsuitable

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DESCRIPTION

The SpectraBeam-HR Full Spectrum Infrared (FSIR) sensor monitors the absorption of infrared energy by components on or in the web. Since specific components exhibit characteristic absorption according to their fundamental chemical structure, the composition of the web or coating can be determined by analyzing the reflected infrared signal.

Full Spectrum Analysis

SpectraBeam-HR monitors infrared absorption in an extended range, from 1.35 to 3.4 microns. By simultaneously analyzing many wavelengths the sensor can discriminate between multiple components, as well as discern between components which exhibit similar, but not identical, IR absorption. Additionally, full spectrum data allows numerical compensation for variations in the reflective properties of the web.

Software-Based Distributed Processing

SpectraBeam-HR applies software-based analysis, rather than relying on hardware filtering techniques utilized in conventional IR sensors. Software spectral analysis provides high flexibility by allowing new component measurements to be implemented by simply introducing recipe-based calibration data. Conventional sensors, on the other hand, require hardware filters to be changed in order to modify the component measurements. SpectraBeam-HR's microprocessor, located in the sensor housing, allows full spectrum analysis to be performed by the sensor itself. Local intelligence enables the sensor to process full spectral data every 6 milliseconds. The spectral data is transmitted to the scanner processor in the frame by means of a serial Bit Bus interface, increasing reliability by eliminating complex signal wiring.

Same Spot Measurement

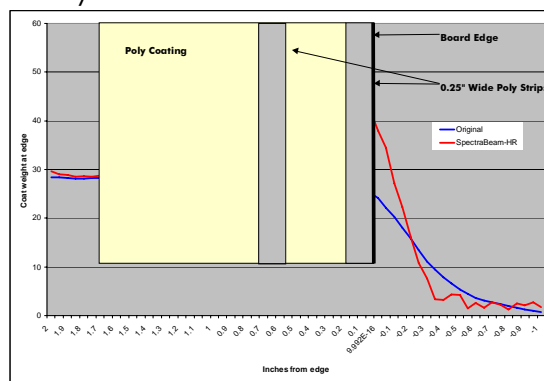
SpectraBeam-HR distributed processing enables the full spectrum to be measured every 300 microseconds, providing a measurement, which is insensitive to point-to-point formation variations in the web. Conventional IR sensors, in contrast, exhibit up to a one second time delay between analysis points, making them susceptible to errors due to web variations.

Compensated Design

SpectraBeam-HR is designed to be insensitive to environmental effects. Proprietary techniques modulate the detector to the IR source, eliminating any interference from ambient light. Detectors are thermo-electrically cooled in order to maintain repeatable measurements even as ambient temperatures fluctuate.

High Resolution

SpectraBeam-HR incorporates new improved optics for significantly enhanced streak resolution without compromise in fundamental accuracy



SPECIFICATIONS

IR Analysis Range.....	1.35 – 3.4 Microns
Measurement Interval .	Up to 6 milliseconds
Accuracy.....	Please Consult a Thermo Fisher Scientific Representative for Specific Application performance, which is product Dependent
Scan Speed.....	Up to 37 cm/s (15 in/s)
Sensor Interface	Bit Bus Serial Interface (375 Kilobaud)