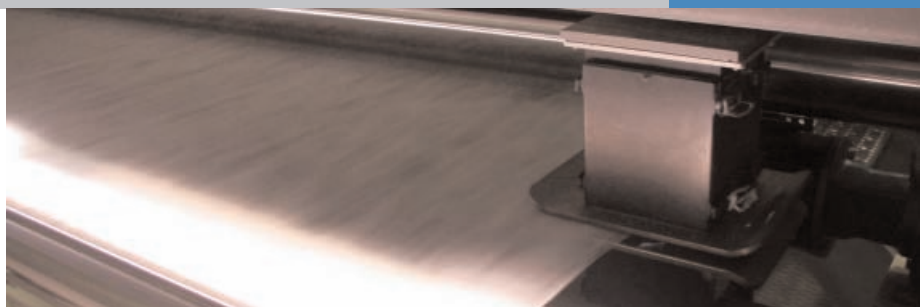


Thermo Scientific X-Ray Master Sensor

Weight, Thickness and Component Measurement Gauges

The Thermo Scientific X-Ray Master Sensor provides accurate, stable high-resolution weight or thickness measurement to improve the quality of films to fiberglass. Its digitally controlled power source enables the sensor to be precisely tuned to measure specific material properties. Therefore, a wide range of products can be measured on the same line with a single sensor, resulting in a simple, cost-effective solution.



Applications

- Cast film
- Biax
- Extruded film and sheet
- Non-wovens
- Insulating materials
- Coat weight
- Calcium carbonate
- Titanium dioxide



Features

- High signal-to-noise X-ray source tube
- Low-power X-ray tube
- Thermo-electrically cooled X-ray tube
- Digitally-tuned X-ray source
- Non-nuclear sensor
- Minimum radiation shielding requirements
- High-speed thermopile air gap temperature measurement
- High-resolution measurement capability

Thermo Scientific X-Ray-Master sensors provide non-contacting, scanning measurement of weight, thickness or composition of a material on a moving web. The X-ray absorption characteristics of the product are used to accurately measure its properties. The sensors deliver accurate, high-resolution measurement over a wide product range compared to nucleonic techniques.

A stable, high-flux, low-noise X-ray source is digitally tuned across the ranges 10 to 30 keV depending on the material to be measured. The voltage is maintained to within ± 2.0 V at 30 keV. Using a low power X-ray tube eliminates the need for external cooling utilities. A robust calibration algorithm enables the easy addition of new products to maximize the benefits from optimization controls and return on investment.

Three Application-Matched Sensors

The Model S-XRAY0-00 sensor is designed for use with film and sheet products. Its 4-mm source footprint is capable of detecting 1.25-mm streaks, a feature which

is also invaluable for edge bead characterization on biaxially orientated film and sheet lines. Other applications include subtractive X-ray coat weight measurement and individual component determination such as calcium carbonate in polyethylene.

The Model S-XRAY0-01 sensor has a 40-mm gap that is designed for use on specialty non-woven applications. The Model S XRAY0-02 sensor has a 600-mm wide gap for fiberglass and other building product applications.

The sensor is supported with a full suite of maintenance displays for calibration, accuracy verification and diagnostics. As X-ray measurements are non-nuclear, they are not subject to the regulations surrounding the use or disposal of nucleonic sources. Generally, X-ray measurements require minimal shielding due to their low operating energy levels. Also, there is no deterioration of the signal over time, nor is there a radiation hazard once the sensor is powered down. Each material is linked to its specific X-ray power setup requirements through the system's recipe management.

Thermo Scientific X-Ray Master Sensor

Specifications

High Flux X-ray Tube	High signal-to-noise measurement; Thermo-electrically cooled; No source decay; Low power without the need for external cooling
Digitally-Tuned X-ray Source	Accurate, repeatable sensor performance; Digitally tunable for accurate, selective measurement; Recipe-dependent X-ray energy
Optimized Source Geometry	Streak and edge bead measurement capability for film; Web edge measurement of the material; High-flux measurement for heavier materials; Wide measurement gap for fiberglass and insulation materials
High-speed thermopiles	Fast, accurate, direct air gap measurement; Accurate film measurement capability
Robust calibration algorithm	Accurate measurement across the product range; Easy addition of new product calibrations

Specifications

	Model S-XRAY0-00	Model S-XRAY0-01	Model S-XRAY0-02
Air gap	15 mm (0.6 in)	40 mm (1.6 in)	600 mm (24 in)
Nominal X-ray tube energy	10 keV	20 keV	30 keV
Measurement range	20-10,000 g/m ²	20-10,000 g/m ²	400-50,000 g/m ²
Repeatability: ±2Sigma (whichever is greater)	±0.025% or ±0.1 g/m ²	±0.025% or ±0.1 g/m ²	±0.025% or ±0.5 g/m ²
Static accuracy: ±2Sigma (whichever is greater)	±0.1% or ±0.1 g/m ²	±0.1% or ±0.1 g/m ²	+/-0.1% or ±0.5 g/m ²
Dynamic accuracy: ±2Sigma (whichever is greater)	±0.2% or ±0.2 g/m ²	+/-0.2% or ±0.2 g/m ²	+/-0.2% or ±1.0 g/m ²
Measurement footprint	4 mm x 12 mm standard	15 mm x 17 mm standard	50 mm x 25 mm standard
Measurement resolution	<0.1 g/m ²	<0.1 g/m ²	<0.1 g/m ²
Response time	10 msec	10 msec	10 msec
60% streak response	2.5 mm (0.1 in) wide	9.0 mm (0.35 in) wide	30 mm (1.2 in) wide

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