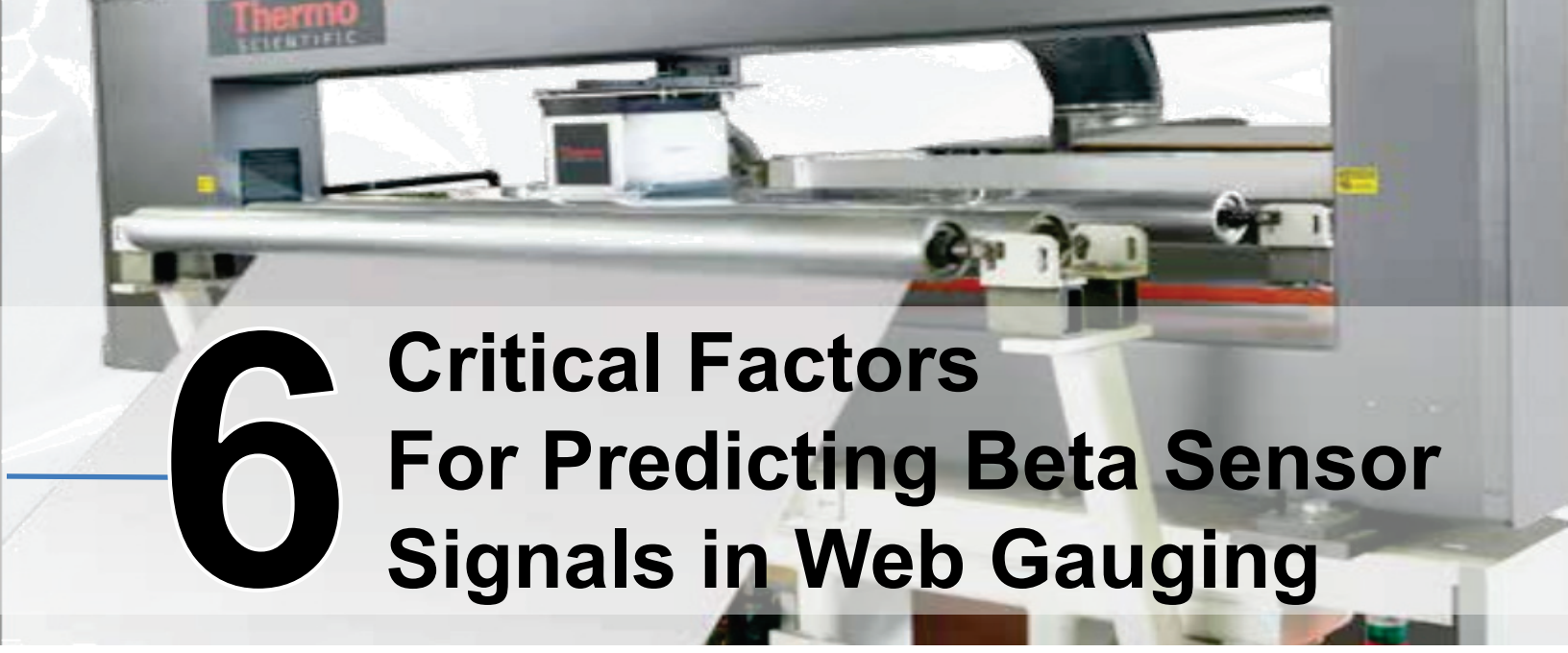
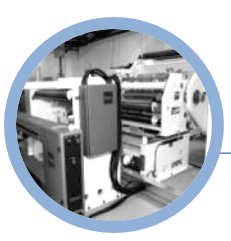


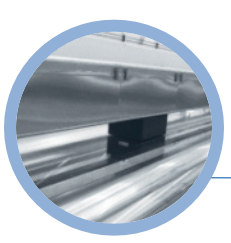
6 Critical Factors For Predicting Beta Sensor Signals in Web Gauging

Beta transmission sensors are used in the web gauging industry to measure basis weight and control processes in the polymers and plastics industry. Beta sensor measurement is based on the absorption of beta particles emitted either from a Kr-85 or Sr-90 source (depending on the application) by the web to determine the resulting basis weight of the web. For the best measurement and therefore the best control, there are a number of design elements that are critical to delivering superior sensor performance. As with any measurement technique, the amount of electronic signal generated by the sensor provides the best results.



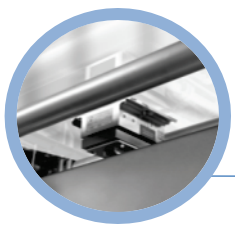
1 SOURCE STRENGTH

[Number of beta particles emitted]
High source strength provides the highest signal and lower ratiometric noise, thus improving the quality of the measurement.



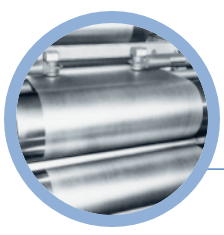
2 PHYSICAL GEOMETRY OF THE SOURCE

Unique slot source geometry (instead of the common circular geometry) of the source capsule improves measurement resolution for optimal edge and gauge band detection. In most cases, better edge measurement leads to smaller edge bead, which saves raw materials and reduces the amount of trim.



3 ALIGNMENT OF THE SOURCE TO THE DETECTOR

Misalignment of the source and detector due to wear-and-tear, mechanical run-out or vibration contributes significantly to measurement noise. Special source and detector optics are used to make the sensor nearly insensitive to X-Y-Z misalignment of up to 6X the normal scanning path run-out.

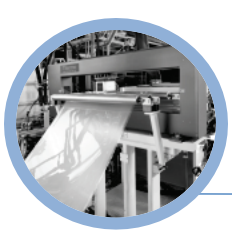


4 WEB MOVEMENT OR “SHEET FLUTTER” BETWEEN THE SOURCE AND THE DETECTOR

Sheet flutter – the up-and-down movement of the material during a normal operation – causes measurement noise and error. Beta transmission sensors fitted with a special detector optic reduce this measurement error and improve measurement repeatability.

5 MEASUREMENT IMPACT FROM OPERATING TEMPERATURE AND PRESSURE VARIATION

Temperature and Pressure fluctuation throughout the day affects the measurement of the web because it changes the amount of air molecules found in between the source and detector (PV = nRT). Therefore, a change of 10°C is equal to a change of about 1gsm of air molecules, thus temperature and pressure compensation are necessary, especially in thin film application.



6 FULL RANGE CALIBRATION

Does production change frequently? Each sensor is calibrated for its full measurement range capability to ensure the full mix is covered.

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