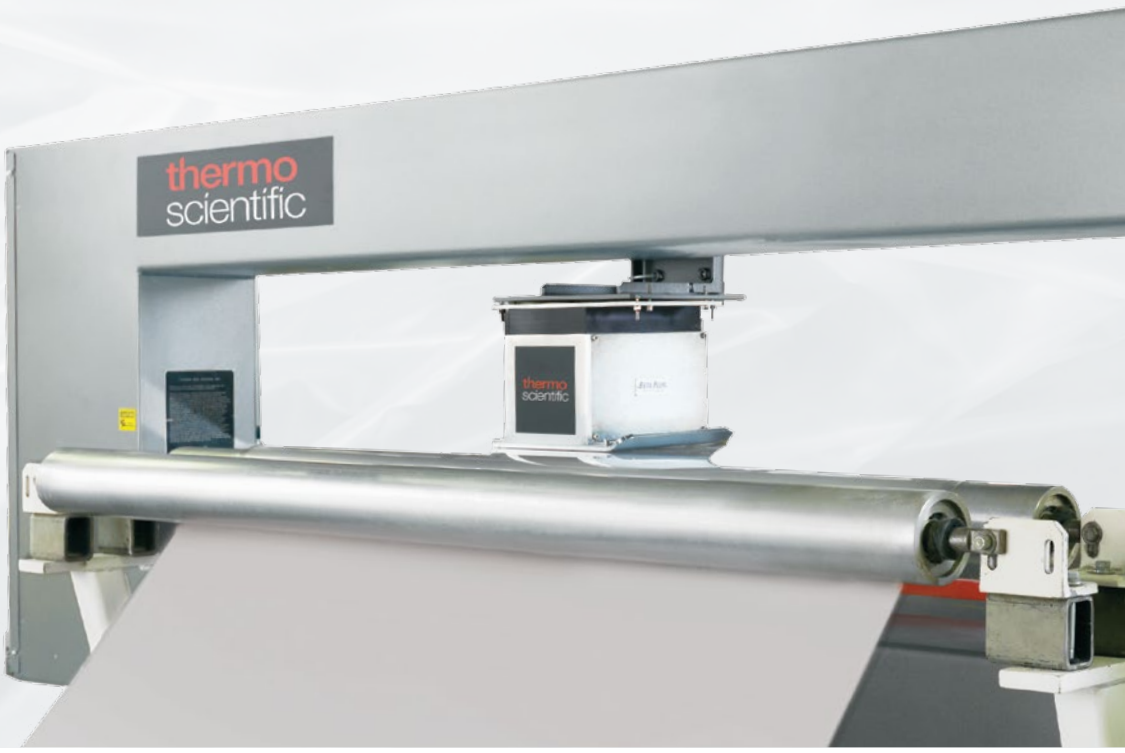
thermo scientific

Thermo Scientific Beta Plus Basis Weight Sensor



State-of-the-art design for superior web measurement and control

ThermoFisher SCIENTIFIC

Thermo Scientific Beta Plus

Basis weight transmission sensor

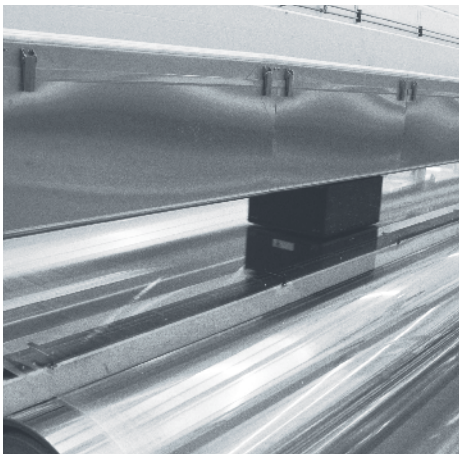
Our history of beta gauges

The Thermo Scientific™ Beta Plus™ family of sensors are the latest in a long line of Thermo Scientific web gauging product solutions. Building off a legacy that started in the 1940s as Tracer Labs, to products brought to the market under the former LFE, Aeonic, EGS, Eberline, FAG and Radiometrie brands, over 10,000 Thermo Scientific measurement and control solutions have been shipped throughout the world. Each solution provides material savings and increased line utilization over a vast array of applications.

Headquartered in Erlangen, Germany with sales and service resources regionally located throughout the world, we have a complete suite of product and services to support the customers' gauging measurement and control requirements. Whether it is extending the life of a legacy platform, meeting traditional web gauging needs, or adapting our building blocks to address a new application, we are your gauging partner.

Applications

- Film and sheet extrusion
- Extrusion coating
- Non-wovens
- Roofing
- Building products
- Gum calendering
- Vinyl calendering



Each solution provides material savings and increased line utilization over a vast array of applications.

Committed to providing total solutions

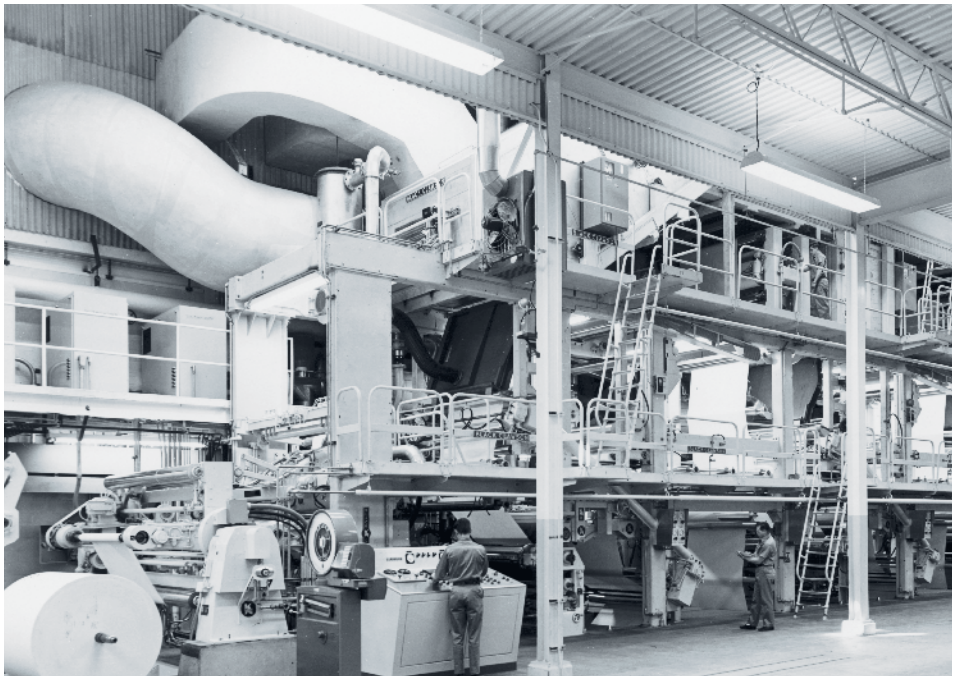
Beta gauge basics

Thermo Scientific Beta Plus 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 compared to noise, provides the best results.

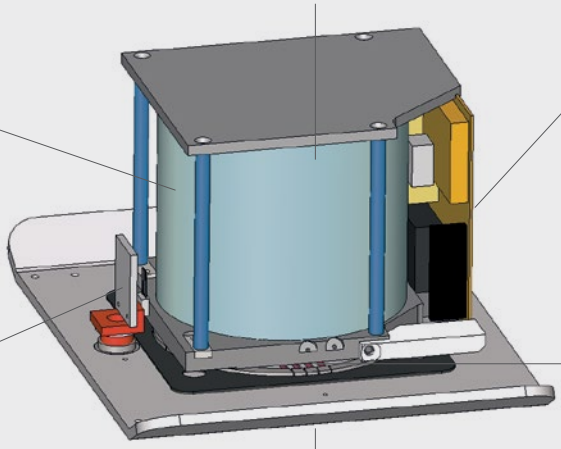
Strong predictable signal greatly depends upon:

- Source strength (number of beta particles emitted)
- Detector geometry to electrically count the particles to create the measurement signal
- Physical geometry of the source
- Alignment of the source to the detector
- Web movement or ‘flutter’ between the source and the detector
- Measurement impact from operating temperature and pressure variation
- Full range calibration



Features and design

Detector assembly



High efficiency detector
- Reduced air gap
- 2X signal for better performance

Low radiation profile
Lower radiation profile than conventional 200mCi sensor

Temperature stabilized high-speed digital electronics
- State of the art
- Rapid response
- Fast data acquisition
- More measurements
- Ultra low noise

Infra-Ray™ high-speed temperature compensation
Removes measurement error induced by temperature fluctuations

High efficiency optics
- Maximize signal
- Optimal streak/gauge band detection
- Superior repeatability
- Flutter insensitivity

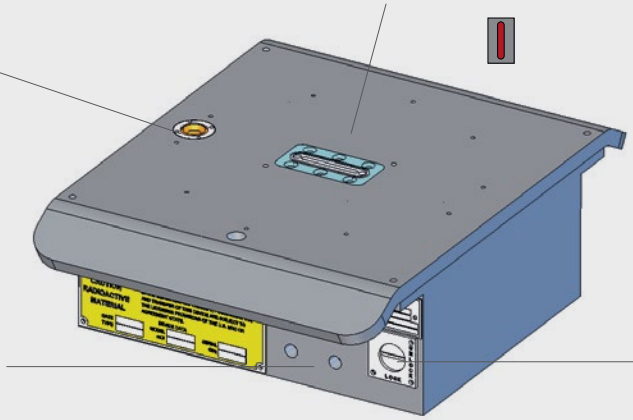
Quick change window
- Easy maintenance

Source assembly

Infra-Ray high-speed temperature compensation
Removes measurement error induced by temperature fluctuations

True slot geometry Beta Plus Kr-85
- Smaller spot size
- High resolution
- Excellent gauge band detection

Other Manufacturer:
Round source Masking
- Simulate true slot geometry
- Significant signal loss
- Poor gauge band detection



Shutter controlled electronics
- Longer life
- Low power, low heat
- Better temperature performance

Mechanical shutter lock
Improve safety during transportation

Features and benefits

New design features

- Simple reliable rugged design
- Low cost of ownership
- Quick change windows
- Low radiation profile
- Strong signal/low noise measurement
- True slot source geometry with Krypton
- Temperature and pressure compensation
- High-speed digital electronics
- High efficiency optics
- Maximum ambient operating temperature up to 60 °C

Benefits

- Raw material savings
- Scrap reduction
- Improved yield
- Higher quality products
- Superior control
- Streak detection
- No external cooling

Performance specification table for each sensor configuration on Thermo Scientific 21Plus! Gauging Platform

	Source type	
	Kr-85	Sr-90
Available source strength	1250 mCi	100 mCi
Measurement range	6 to 1600 gsm	100 to 7000 gsm
Repeatability 2σ	± 0.1 gsm or ± 0.025% whichever is greater	± 0.1 gsm or ± 0.025% whichever is greater
Reproducibility 2σ	± 0.15 gsm or ± 0.05% whichever is greater	± 0.2 gsm or ± 0.05% whichever is greater
Scan average repeatability 2σ	± 0.1 gsm or ± 0.2% whichever is greater	± 0.25 gsm or ± 0.2% whichever is greater
Passline variation 2σ	± 0.1 gsm or ± 0.2% whichever is greater	± 0.25 gsm or ± 0.2% whichever is greater
Streak resolution	100% signal for 10mm streak	75% signal for 10mm streak
Measurement response time	2ms	2ms
Measurement air gap	16mm	32mm

We take the safety of the solutions we provide very seriously. Although the previous generation of sensors were well shielded, Beta Plus transmission sensors feature improved shielding design geometry, providing added safety for operators who work around the system. Personnel exposure is therefore dramatically reduced.

Radiation profile

Beta Plus 1250mCi Kr-85	Shielding improvement
Distance from housing	Shutter closed
30cm	70%
Beta Plus 100mCi Sr-90	**Shielding improvement**
Distance from housing	Shutter closed
30cm	70%

Support you can depend on

Thermo Scientific products are supported by our extensive network of qualified application engineers who will work closely with you to understand and evaluate your specific production parameters. Our experts will help you choose the right instruments for your application, then keep them performing to spec. Their goal is to optimize your process today, and also lay the foundation for easy upgrades in the future.

Product maintenance

Our comprehensive service offering is based on corrective and preventative maintenance that not only reduces downtime, but also helps you improve your process. We offer multiple levels of support agreements, with varying degrees of access and response, including:

- System commissioning
- System calibration
- Preventative maintenance
- On-site repair
- Depot repair

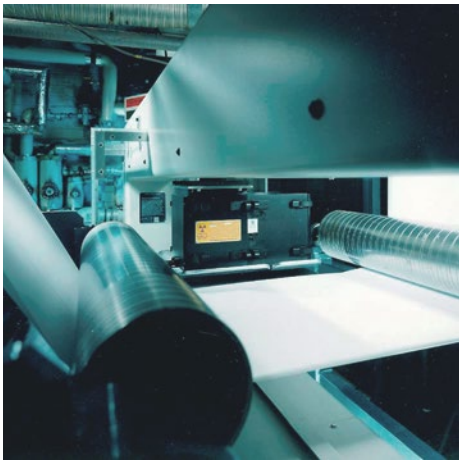
Some options feature complete cost predictability, with all travel, labor, spare parts, and consumables included.

Education and training

We offer multiple training options to help you increase productivity by optimizing the use of your instruments and expanding the skills of your operators. You can receive hands-on instruction in your plant or at one of our training facilities in the USA, Europe and Asia. Our range of courses covers:

- Basic operation
- Calibration
- Routine maintenance
- Troubleshooting
- Certification

We will also work with you to develop a custom program that meets your specific training objectives, often incorporating your own operating procedures.

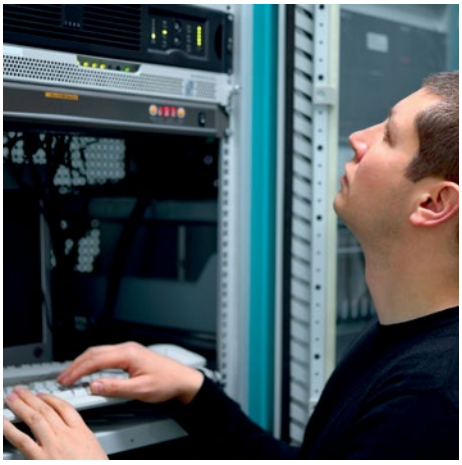


Professional services

Our certified engineers are available to review your process, perform benefit analysis and recommend improvements to help you meet your best-practice goals. We will develop an implementation plan that integrates all Thermo Scientific systems, as well as third-party components including:

- System layout and connectivity
- Software implementation, configuration and support
- Site modifications

You can rely on us to manage the entire installation and start-up if you choose, including serving as a liaison with licensing agencies where necessary.



Parts and upgrades

Our spare parts are designed specifically for your Thermo Scientific system, and we make it easy for you to secure high-quality, low-cost replacements by maintaining offices around the world that respond quickly to your phone or online requests. You can also extend the lifetime of your older instruments with our add-on system enhancement and retrofit packages, which adapts your instruments for new uses and eliminates the time and cost to retrain operators on new equipment.

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Thermo Fisher Scientific, Erlangen, Germany is ISO Certified.

Visit **www.thermofisher.com/gauging** or email us at **sales.gauging@thermofisher.com**

USA
200 Research Drive
Wilmington, MA 01887
+1 978 663 2300

Germany
Frauenauracher Str. 96
91056 Erlangen
+49 (0) 9131 998 0

Brazil
Rúa Eugênio de Medeiros,
303, 11th floor
CEP: 05425-000 São Paulo – SP
+55 11 2730 3261

China
Building 6, No. 27 Xin Jinqiao
Pudong, Shanghai 210206
+86 (0) 21 6865 4588

Japan
3-9C Building, Moriya-cho,
Kamagwa-Ku, Yokohama 221-022
+81 45 453 9188

India
101/102 Pride Portal
Shivaji Housing Society
Village Bhamburda, Pune 411016
+91 20 6626 7000

Korea
Kookmin 1st Bldg, 6th floor,
1009-5, Daechi-Dong, Gangnam-Gu,
Seoul, 135-851
+86 (0) 21 6865 4588

Australia
18 Butler Boulevard
Burbridge Business Park
Adelaide, 5950
+61 (08) 8208 8200

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