

thermo scientific



Optimize your metals production process

Upstream and downstream

ThermoFisher
SCIENTIFIC

We understand your challenges

Steel is the material that drives our modern economy. It is used in every aspect of our lives, in the walls of our homes, the bodies of our cars, the basic infrastructure of our society. With over one billion tons of steel consumed each year, new uses are being explored each day. Demand at that level presents challenges in the metallurgical labs, cast shops, and rolling mills around the world.

Steel production is a 24-hour-a-day, 365-day-a-year process, dependent on a consistent supply of raw materials and huge amounts of energy. High demand for iron ore, coke and scrap steel, increasing energy costs and industry consolidation have prompted steel producers to develop new methods for gaining efficiency to remain competitive.

The production methods using raw materials have improved significantly over the past decade, and scrap-based production is accounting for a larger portion of the total steel supply. These shifts in production require producers to be aware of, and willing to adopt, the latest technologies to lead the industry, both commercially and environmentally.



Committed to providing total solutions

We are committed to helping you optimize your steel production process at every critical stage, from incoming raw materials to the final coating line. As the global leader in scientific and process instrumentation, we offer an unmatched breadth of products, software and services, extensive geographic reach and a long history of proven operational expertise. We understand your process, we know the challenges you face and we will work with you to develop effective solutions.

We can deliver the right instrument and data management systems for your application, no matter where your facility is located.

Our products are easy to integrate, set new standards for accuracy, and consistently generate the information you rely on to improve production and product quality. In addition, we offer services and support that enhance the value of your investment long after the equipment has been installed.

Our Thermo Scientific™ products have been serving the metals industry for decades. We are proud to put our years of experience to work for you, to help distinguish your business in an increasingly competitive global industry.



Unmatched capabilities throughout the process

Whether you're producing steel from iron ore or scrap, and your end product is several inch-thick slabs or galvanized sheet less than a millimeter thick, our Thermo Scientific metals product line includes a complete range of technologies to help you improve plant efficiency and product quality. You can rely on our unmatched breadth of capabilities

for critical functions throughout your operation, from monitoring incoming ore, to elemental analysis in the melt shop, to online measurements in the rolling mill, to managing process and laboratory data plant-wide. Our product line is extensive, our process expertise runs deep and our services and support will keep your systems running at top performance.

Put our vast experience to work for you. Learn more at: thermofisher.com/metals

Thermo Scientific™ solutions in steel production

Raw materials processing

- Weight verification
- Elemental analysis using XRF and SEM/EDX
- Phase analysis using XRD
- Handheld XRF analysis
- Online elemental analysis of coal
- Density, flow and level measurement
- Online gas and moisture analysis
- Radiation measurement and protection
- Particulate monitoring
- Laboratory informatics

Steel making

- Elemental analysis using Spark OES, XRF and SEM/EDX
- Inclusion analysis using Spark OES and SEM/EDX
- Handheld XRF analysis
- Flow measurement
- Online gas analysis
- Radiation measurement and protection
- Particulate monitoring
- Laboratory informatics

Hot rolling

- Thickness measurement and lab XRF analysis
- Profile measurement
- Data acquisition & management
- Radiation measurement and protection
- X-ray source/flux stability

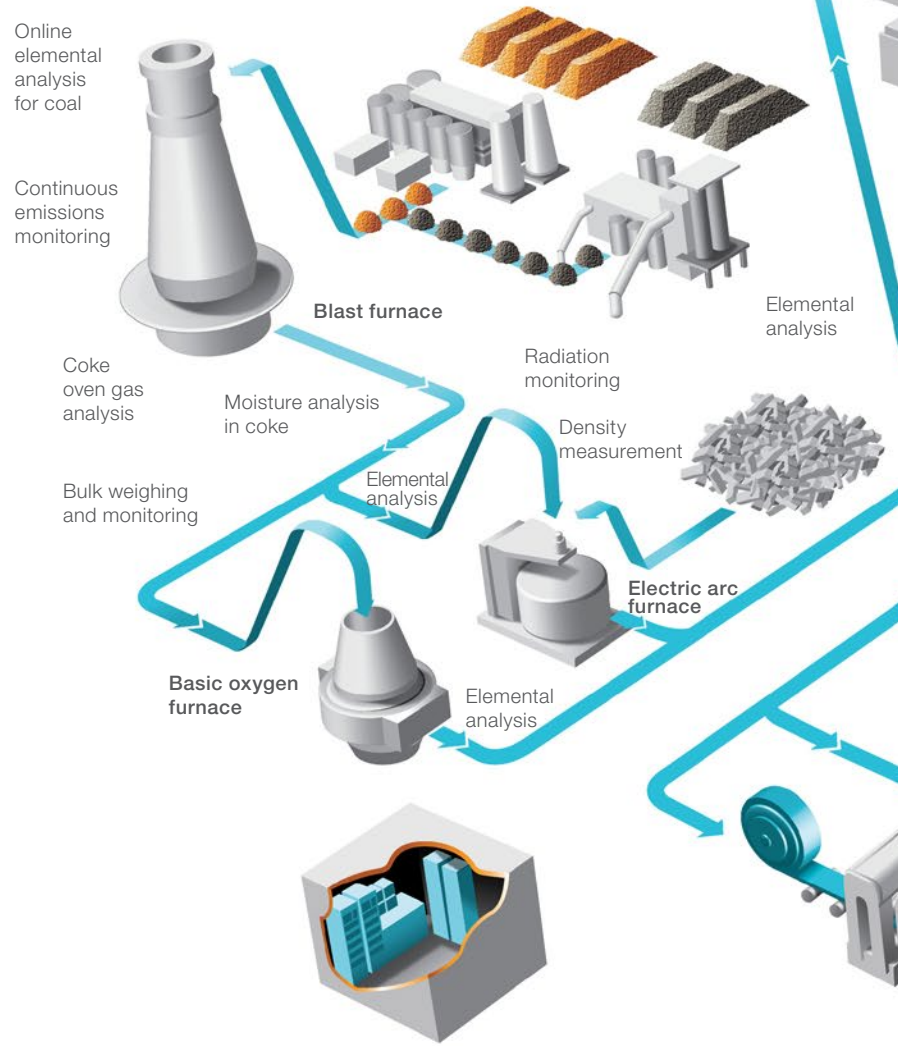
Cold rolling

- Thickness measurement and lab XRF analysis
- Elemental analysis using Spark OES
- Gas analysis
- Data acquisition & management
- Radiation measurement and protection

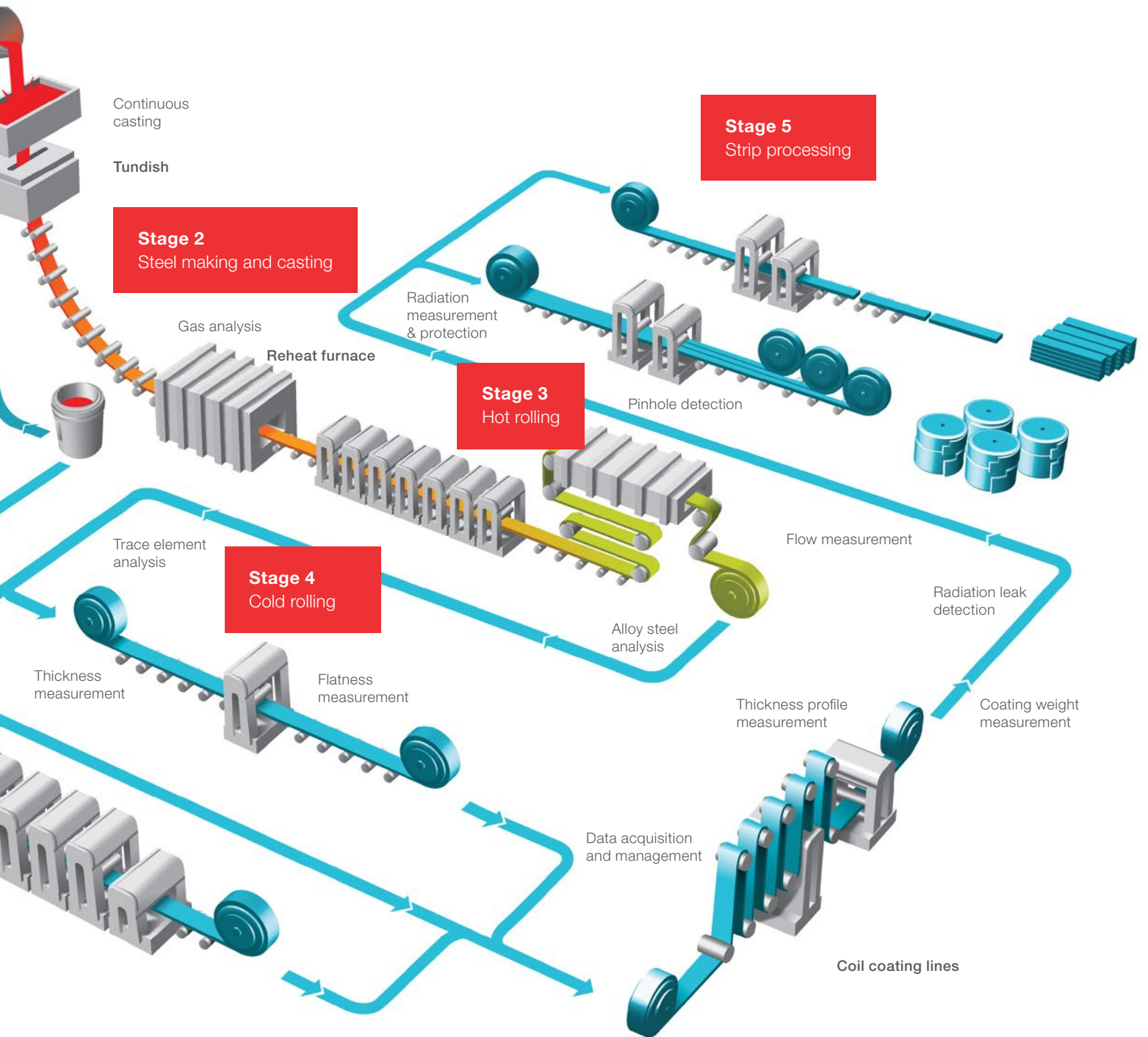
Processing lines and finished products

- Coating weight measurement
- Thickness measurement
- Elemental analysis using Spark OES, XRF and SEM/EDX
- Inclusion analysis using Spark OES and SEM/EDX
- Laboratory informatics
- Gas analysis
- Radiation measurement and protection
- Data acquisition & management
- Particulate monitoring

Stage 1 Raw materials processing (iron ores)



- Laboratory**
- LIMS and CDS
 - Ambient emissions monitoring
 - Spark OES analysis
 - XRF and XRF-XRD analysis
 - Automated sample preparation and analysis



Integrated products throughout the process

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.

Gas, moisture and air quality analysis

When you need effective monitoring of coke consumption and environmental emissions, the vast range of Thermo Scientific gas analyzers provide the data you need for tighter process control. Whether your goal is to reduce coke consumption, eliminate reheats in the steel mill or use gas fuel more effectively, our process mass spectrometer can quickly and accurately analyze the top gas with unmatched performance. Our moisture online analyzer can improve the operation of the blast furnace by accurately measuring the moisture content in the coke that is fed into the furnace. Field proven systems measure pollutants in the most severe sampling environments and our air quality instruments are used for environmental compliance and process monitoring offering unsurpassed sensitivity, stability and selectivity.

Flat sheet gauging

Thermo Scientific gauging systems provide you with fast, accurate, non-contact and non-destructive thickness and coating weight measurements needed to achieve high product quality and maximum productivity. Our thickness gauges for hot- and cold-rolling mills provide precise, real-time measurements during high-speed production of steel plate and sheet to help you meet the tightest tolerances. On the coating line, our paint and organic coating weight gauges offer cross-profile measurements to ensure uniformity for better quality and less waste. For zinc-coated steel sheet, our hot coating weight gauge provides fast feedback for coating control. When coupled with our closed-loop coating weight control system, raw zinc consumption can be minimized, resulting in significant economic savings.



Thermo Scientific™ MOLA
(MoistureOn-Line Analyzer)



Thermo Scientific™ RM 315 EC
Galvanneal Coating Weight Gauge



Thermo Scientific™ RM 210 CM
Thickness Gauge

Committed to providing total solutions

Elemental analysis

The analysis of trace and alloying elements throughout production is faster and more accurate using our Thermo Scientific spectrometry technologies. We offer both Spark Optical Emission Spectroscopy (OES) and X-ray fluorescence (XRF) to meet the need for greater precision along with lower limits of detection. Our OES metals analyzers can be used at different metal production stages, while XRF is used for analysis of raw materials, slags and alloys. The quality of your results and the speed of analysis can be further enhanced with our robotics-based platform that fully automates sample preparation, sample transfer and spectrometer operation. It improves dependability by eliminating sources of errors.

Our handheld XRF analyzer combines the most powerful X-ray tubes ever used in a portable XRF instrument with advanced electronics and materials technology to help with scrap sorting and slab grade identification.

When you need slurry analysis, our online elemental analyzers provide minute-by-minute analysis results to optimize the flotation process.

Inclusion and phase analysis

Our OES metals analyzers can also be used for fast, online evaluation of non-metallic micro-inclusions. Numbers, type, composition and size of inclusions obtained within minutes allow quick decisions and corrective actions before inclusion issues negatively affect process and product quality.

Our SEM/EDX system provides fast information for the inclusion size, shape, image, and composition on lollipop, as cast, and final product samples. Compare inclusion morphology and composition across different heats or different grades to optimize process flow, saving cost by improved energy management, improved raw material consumption, reduced nozzle clogging and remelts.

X-ray diffraction (XRD) is used for analysis of some phases. Our combined XRF/XRD spectrometers are very useful in such cases.



Thermo Scientific™ ARL iSpark OES Metals Analyzer



Thermo Scientific™ Niton™ XL5 Analyzer



Thermo Scientific™ ARL 9900 X-Ray Workstation



Thermo Scientific™ Explorer 4 Analyzer

Integrated products throughout the process

Emissions monitoring

Rely on our breadth of Thermo Scientific products for monitoring ambient air and process gases during various stages of production. Our continuous emissions monitoring systems extract a sample from the source, filter particulates, remove moisture and dilute the sample for analysis of the sample gas. Our ambient air analyzers are integrated systems complete with gas analyzers, meteorological sensors, data recording devices and signal transmission instrumentation. For process and personnel safety, we offer oxygen, hydrocarbon and toxic gas sensors that are housed in explosion-proof structures.

Bulk weighing and monitoring

Quickly and safely transport accurate amounts of raw materials into your facility using our complete line of Thermo Scientific belt scales, feeders, level indicators and inventory tracking systems. We offer a series of belt scales to accommodate your operation, with a range of conveyor speeds and levels of accuracy. Our weighbelt feeders provide a consistent flow for blending or batching, from light materials at low feed rates to heavy-duty loads requiring faster feeds. Our continuous and point level indicators help you monitor the amount of materials in bins or silos and ensure material is moving through your process containers.

Data acquisition and management

Track, store and manage in-process and laboratory analytical data from all stages of your process using our comprehensive portfolio of integrated Informatics solutions. Laboratory Information Management Systems (LIMS) automate time consuming and error-prone activities, making it easy to compare process and production data against specifications and regulatory standards for faster, more informed decisions. Thermo Scientific™ SampleManager LIMS™ integrates with instrumentation, MES and ERP systems across the enterprise to effectively capture, store and report information in the right format to those that need it. The Thermo Scientific SmartView product line provides an innovative approach to streamlining the collection, distribution and analysis of critical process data replacing existing paperless or traditional chart recorders.



Thermo Scientific™ Prima PRO Process Mass Spectrometer



Thermo Scientific™ Ramsey™ IDEA BeltScale System



Thermo Scientific™ SampleManager Software

Density and flow measurement

Our rugged density gauge accurately identifies the moisture in coke and pellets being fed into the blast furnace. It mounts externally and uses ionizing radiation to provide non contacting measurement. By reliably verifying the bulk density of coke, this gauge provides the necessary density compensation for our moisture analyzer. Our Thermo Scientific flow measurement products include noninvasive, microwave-based instruments that detect and monitor flow/no-flow conditions of bulk solids in pipelines, ducts and airslides, as well as at transfer points of chutes, conveyor belts and bucket elevators.

Radiation detection

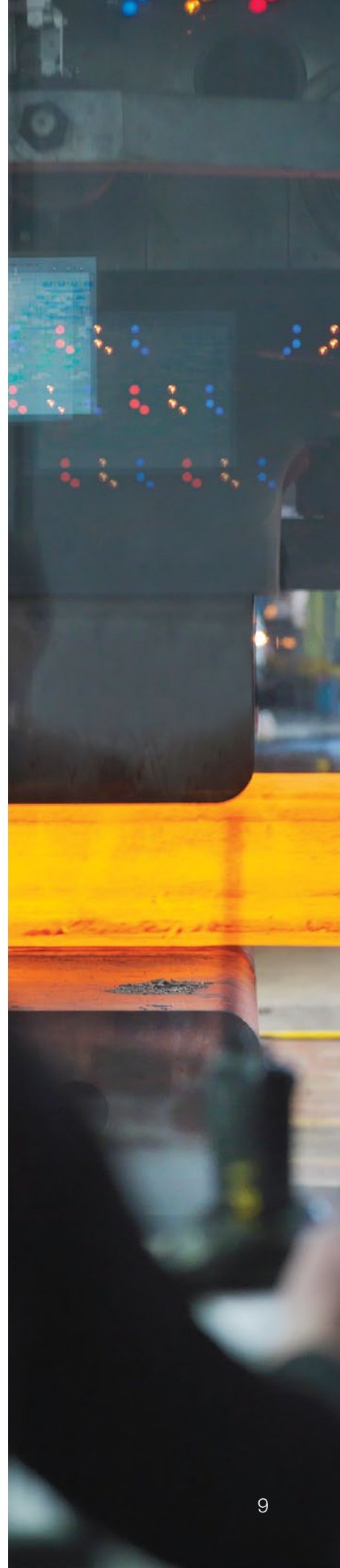
Prevent radioactive materials from entering your facility in truck or rail car loads of scrap metal using our advanced Thermo Scientific ASM vehicle-monitoring systems. Our rugged drive-through detectors provide full vertical coverage of vehicle loads for reliable and highly sensitive radiation detection. This technology can also be adapted for conveyor monitoring of incoming raw materials. For closer inspection of localized “hot” spots in the load, our Thermo Scientific handheld radiation detectors allow you to confirm the type of contamination and isolate it before it enters your facility. Our radiation monitors are used in the lab to check samples for contamination, and our pocket-sized personal radiation detectors alert workers to potential exposure to radiation source-based equipment.



Thermo Scientific™ Density PRO Gauge



Thermo Scientific™ RadEye™ Personal Radiation Detector



Support you can depend on

Product maintenance

Our comprehensive service offering is based on corrective and preventive 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 calibration
- On-site repair
- Depot repair
- Preventive maintenance
- System commissioning

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 startup 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 through our add-on system enhancement and retrofit packages, which adapt your instruments for new uses and eliminate the time and cost to retrain operators on new equipment.



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Thermo Fisher Scientific,
Erlangen, Germany is ISO Certified.

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

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