

Optimize your aluminum  
production process  
at every critical stage

**ThermoFisher**  
SCIENTIFIC

# We understand your challenges

Aluminum is important to our way of life. Its resistance to corrosion, light weight, high strength and recyclability have made it an essential and often preferred material – for products ranging from automobiles to building materials to beverage cans. It's no surprise that aluminum production worldwide has grown dramatically, but as demand has increased, so have the challenges facing aluminum producers.

Primary aluminum production is a complex, 24-hour-a-day, 365-day-a-year process, dependent on a consistent supply of raw materials and huge amounts of energy. Challenges with consistent and affordable alumina supply, increasing energy costs and industry consolidation have prompted aluminum producers to develop new methods for gaining efficiency to remain competitive.

Primary production methods have improved significantly over the past decade, and production from recycled materials is accounting for a larger portion of the total aluminum supply.

But 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

At Thermo Fisher Scientific, we are committed to helping you optimize your aluminum 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 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 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 end-product quality. In addition, we offer services and support that enhance the value of your investment long after installation and commissioning.

Our Thermo Scientific™ products have been serving the aluminum 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 aluminum from primary or secondary sources, and your end product is several-inch-thick plates or foils less than one-thousandth of an inch, our Thermo Scientific 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 during electrolysis, to online measurements in the rolling mill, to managing process 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: [www.thermofisher.com/metals](http://www.thermofisher.com/metals)

# Thermo Scientific solutions in aluminum production

## Raw materials

- Weight verification
- Elemental/phase analysis using XRF, XRD
- Radiation detection
- Particulate monitoring
- Density measurement
- Flow measurement
- Laboratory informatics

## Aluminum production

- Elemental/phase analysis (OES, XRF, XRD)
- Flow measurement
- Particulate monitoring
- Laboratory informatics
- Personal radiation detection

## Casting (hot rolling)

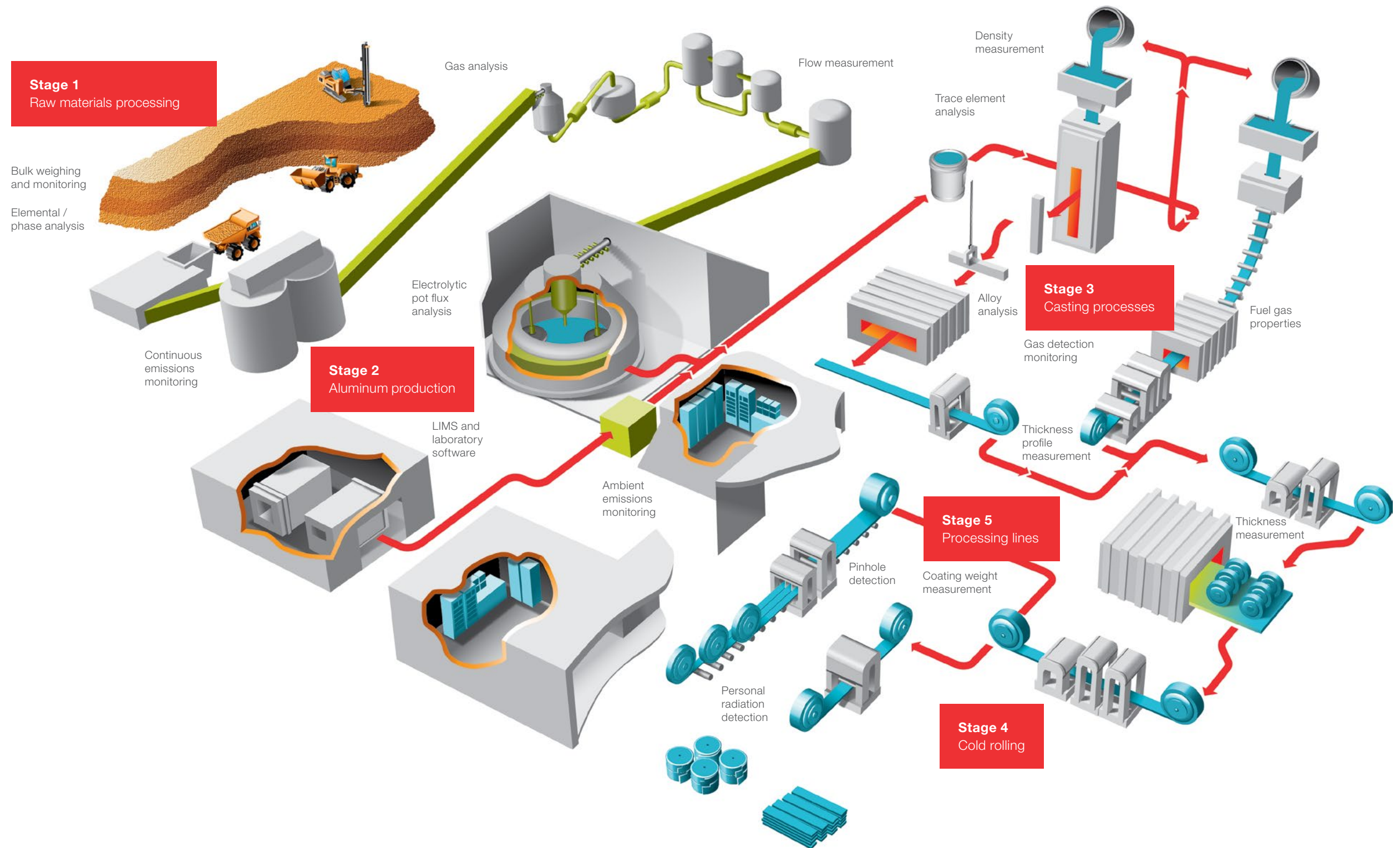
- Thickness gauging
- Density measurement
- Flow measurement
- Personal radiation detection
- Elemental analysis using OES
- Laboratory informatics

## Cold rolling

- Elemental analysis
- Thickness gauging
- Coating weight measurement
- Personal radiation detection
- Laboratory informatics

## Processing lines

- Elemental analysis
- Coating weight measurement
- Thickness gauging
- Laboratory informatics
- Personal radiation detection



# 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.

## Flat sheet gauging

We offer a selection of gauging systems that allow you to make accurate, fast, non-contact and non-destructive measurements online. Our thickness gauges for hot-and-cold-rolling mills provide precise real-time measurements during high-speed production of aluminum plate, sheet and foil. The sensor physicists in our application lab have developed sophisticated alloy compensation algorithms based on fundamental physical properties to help you meet the tightest tolerances for all alloys and clad products. On coil coating lines our paint, primer and organic coating weight gauges offer cross-profile measurements to ensure uniformity for better quality and less waste.

## Emissions monitoring

Rely on our breadth of products for monitoring ambient air and process gases during various stages of production. At the power plant, 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 – all according to U.S Environmental Protection Agency specifications. Our ambient air analyzers are integrated systems complete with gas analyzers, meteorological sensors, data recording devices and signal transmission instrumentation.

Our analyzers ensure that your Selective Catalytic Reduction (SCR) and Flue Gas Desulfurization systems are operating at peak performance, reducing operating costs and lessening environmental impact. For process and personnel safety, we offer oxygen, hydrocarbon and toxic gas sensors that are housed in explosion-proof structures.

## Elemental/phase analysis

The detection and analysis of trace elements and alloys throughout production is faster and more accurate using our leading Thermo Scientific spectrometry technologies. We offer both X-ray fluorescence (XRF) and X-ray diffraction (XRD) techniques to meet the need for greater sensitivity along with lower limits of detection, from raw materials processing through alumina extraction (electrolysis) in the production of aluminum and its alloys. Our optical emission spectrometers (OES) bring laboratory analysis to the rolling line as well for high performance in a rugged, stable system. All systems feature modular construction for optimal configurations along with operator friendly control software.

The quality of your results can be further enhanced with automated sample-handling systems that improve dependability by eliminating subjective factors. Our Sample Manipulation System (SMS) is a robotics-based platform that fully automates sample preparation and analysis, including registration, result distribution, instrument control and standardization.

## Gas analysis

Thermo Scientific™ high resolution mass spectrometry systems take discovery and sample analysis to new heights. We offer easy, high throughput, quantitative workflows for many applications. The Thermo Scientific™ Prima PRO Mass Spectrometer provides fast on-line accurate analysis of the properties of a wide range of fuel gases. These measurements include calorific value, density, specific gravity, Wobbe Index, stoichiometric air requirement and CARI as well as complete compositional analysis.

These data are used to provide the most efficient use of the fuel gases. Process Mass Spectrometry is particularly suited to the measurement of fuel gas because the analysis is comprehensive, accurate and fast. The analysis of all the components present in fuel gas which typically contains many components (e.g. H<sub>2</sub>, CH<sub>4</sub>, CO, N<sub>2</sub>, O<sub>2</sub>, C<sub>2</sub>H<sub>4</sub>, Ar, C<sub>3</sub>H<sub>6</sub>, CO<sub>2</sub>, C<sub>3</sub>H<sub>8</sub>, C<sub>4</sub>H<sub>10</sub> and C<sub>6</sub>H<sub>6</sub>) is completed in less than 30 seconds, with a precision of typically better than 0.1% relative or 0.01 mol% absolute.



Thermo Scientific RM 210 AS Thickness Measurement Gauge



Thermo Scientific™ PROSIS™ Coating Weight Sensor



Thermo Scientific pDR-1200 Active Aerosol Monitor



Thermo Scientific™ ARL™ easySpark™ OES Benchtop Analyzer



Thermo Scientific™ ARL iSpark™/SMS-2500 Automated OES Analyzer



Prima PRO Mass Spectrometer

# Integrated products throughout the process

## Bulk weighing and monitoring

Quickly and safely transport accurate amounts of raw materials into your facility using our complete line of 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 inventory management systems allow you to control level measurements in up to 30 containers. Both systems offer high accuracy where others fail because of dust, vapors, steam and fluctuating temperatures. All of our systems are designed to withstand the rigors of outdoor operation as well as harsh indoor environments to keep your materials flowing smoothly.



Thermo Scientific™ Ramsey™ IDEA Belt Scale System

## Flow, density and level measurement

Our line of density gauges can help you control bauxite slurries or the mix of additives under the most challenging process conditions, in pipe sizes that range from 1 to 40 inches. For level measurement, we offer both continuous and point level gauges to enable tighter control of process materials in vessels and hoppers. These density and level instruments are powered by our unique measurement technology that provides highly accurate readings via extremely small energy sources, to minimize capital expenses and increase plant safety. In addition, our patented Dynamic Process Tracking system immediately responds to changes in the process, then returns to stable operation, ensuring continuous, reliable measurement.



Thermo Scientific DensityPRO Integrated Gamma Density System

Our flow measurement products include non-invasive, microwave-based instruments that detect and monitor flow/no-flow conditions of bulk solids in pipelines, ducts and airslides, as well as transfer points of chutes, conveyor belts and bucket elevators. Real-time flow information allows you to monitor your process more closely for improved product quality.

## Radiation detection

Prevent radioactive materials from entering your facility in truck or rail car loads of scrap metal using our advanced 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 handheld radiation detectors allow you to confirm the type of contamination and isolate it before it enters your facility.

During the production process, our radiation monitors are used in the lab to check samples for contamination, and our pocket-sized personal radiation detectors protect workers from exposure to radiation source based gauging equipment.



Thermo Scientific™ RadEye™ Personal Radiation Detector

## Data acquisition and management

Acquire, track and store data from samples collected at all stages of your process using our industry proven Laboratory Information Management System (LIMS). Thermo Scientific™ SampleManager LIMS™ makes it easier to compare process data with production and adhere to regulatory standards by effectively capturing information and exporting it to other plant systems. Functionality designed to ease compliance includes management of training records, instruments, stocks and suppliers, and ensures that only trained analysts and in-service instruments can be selected. SampleManager workflows make it easy to graphically configure the system so that it drives users through your unique lab processes and automates decisions throughout the lab and beyond.



Thermo Scientific ASM 3000SE Vehicle Monitoring System

The advantages of integrating all scientific and laboratory information into a single application are far-reaching. Through centralized archiving, Data Manager helps eliminate duplicate searches and streamlines information management throughout the organization. Data Manager is an ideal solution for capturing and managing data from analytical instruments and business applications, including instrument output files, certificates of analysis, reports, product specifications, Standard Operating Procedures (SOPs), and much more. Data Manager connects your laboratory and enterprise data, leading to faster, more informed decisions at all levels of the organization. By removing data silos, Data Manager transforms the information produced in your lab into a valuable global asset for your organization.



Thermo Scientific™ SampleManager LIMS™

# 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

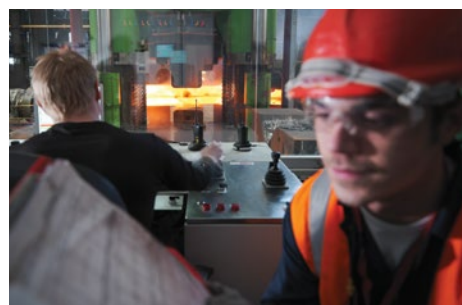
Our certified engineers are available to review your process, perform benefit analysis and recommend improvements to help you meet your Best Practice goals. We will develop an implementation plan that integrates all Thermo Scientific systems, as well as third-party components including:

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

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

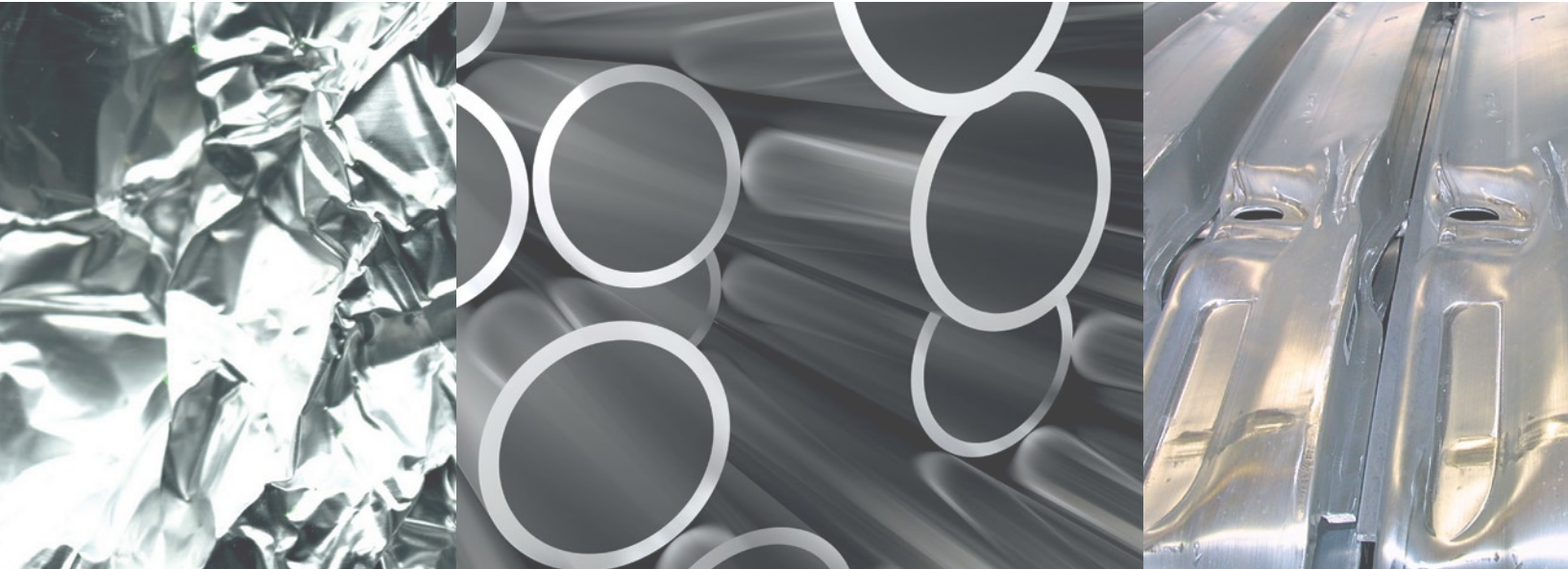
## Parts and upgrades

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 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.



## Optimize your aluminum production process

At every critical stage



Thermo Fisher Scientific,  
Erlangen, Germany is ISO Certified.

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email us at [sales.gauging@thermofisher.com](mailto:sales.gauging@thermofisher.com)

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