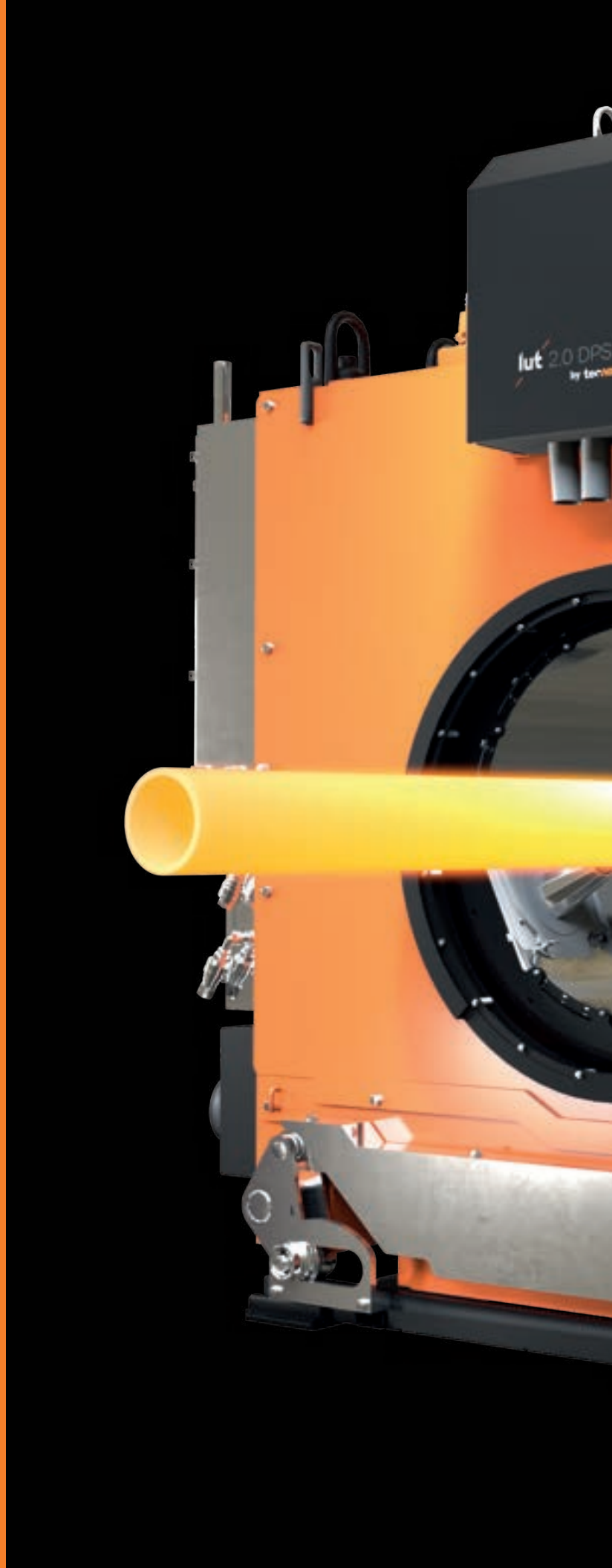
tecnar

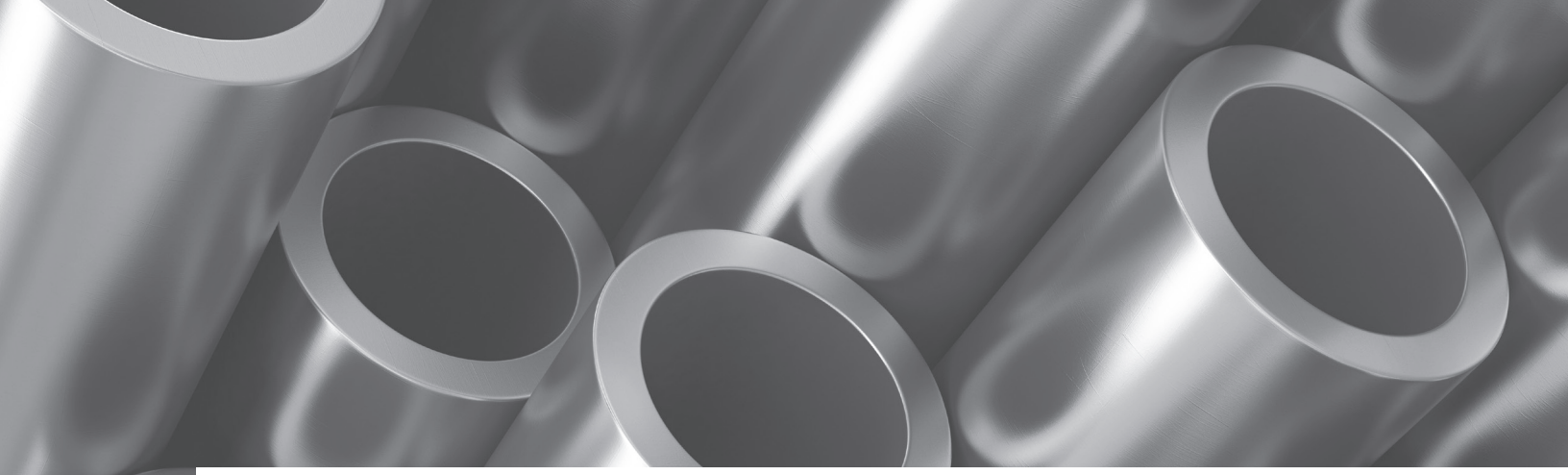
lut 2.0

Brings ultrasound performance

to online hot wall thickness measurement

lut.tecnar.com


lut 2.0 DPS

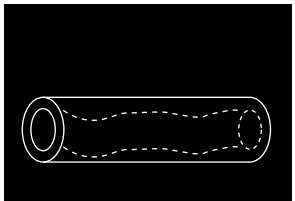


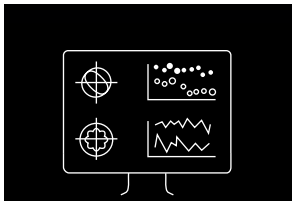
New standard

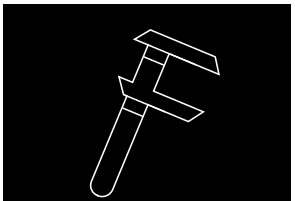
The Lut 2.0, a non-contact ultrasonic gauge for hot seamless steel tubes and pipes, sets the new standard for continuous monitoring. Now, operators can ensure the mill is operating at full capacity.

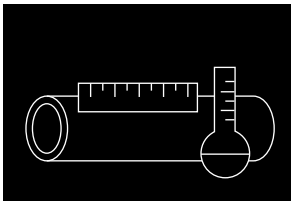
- Avoid losses for short production lots in which every piece needs to be perfect
- Monitor slow wall thickness drifts during long production runs

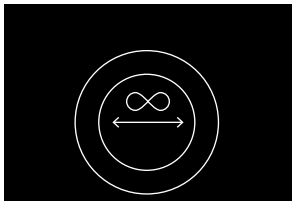
Get the *Lut 2.0* **advantage:**

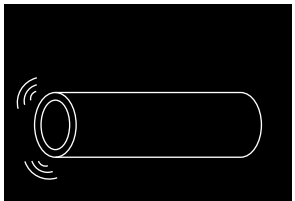

Precise eccentricity measurement

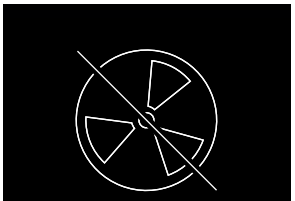

Advanced analytical tools

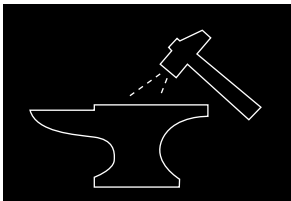

True wall thickness measurement


Full-length and temperature profile


No limit on tube diameter


Insensitive to tube motion


No hazardous radioactive radiation


Robust design for online use

Tecnar's spirit of innovation began with my father's passion for solving practical challenges with breakthrough technologies. Today, Tecnar is still a family-owned company that thrives at the leading edge of our industry. We still take pride in developing products that deliver value the moment they arrive at our clients' facilities.

The Lut 2.0 provides valuable information to hot seamless tube and pipe mill operations. Delivering real-time true data, it is the ideal monitoring tool to see developing trends, react on time, and make adjustments before products fall out of specifications. This results in more consistent quality and less material loss.

The Lut 2.0 gauge system is the right choice when it's time to replace older gauges or add new ones.

Alexandre Nadeau
CEO, Tecnar

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Why choose Lut 2.0?

Tecnar has over 20 years of experience implementing non-contact ultrasonic thickness gauges in hot seamless tube mills. **The Lut 2.0** is engineered to provide the most accurate wall thickness information in a robust, low-maintenance package.

Reduce mill set-up time up to 200h/year

Increase yield up to 5%

Reduce thickness variation to less than 7%

Reduce heavy-ends losses by >2%

No gamma ray emission

Environmental Health and Safety friendly (EHS)

Innovations that set it apart

Laser ultrasonics

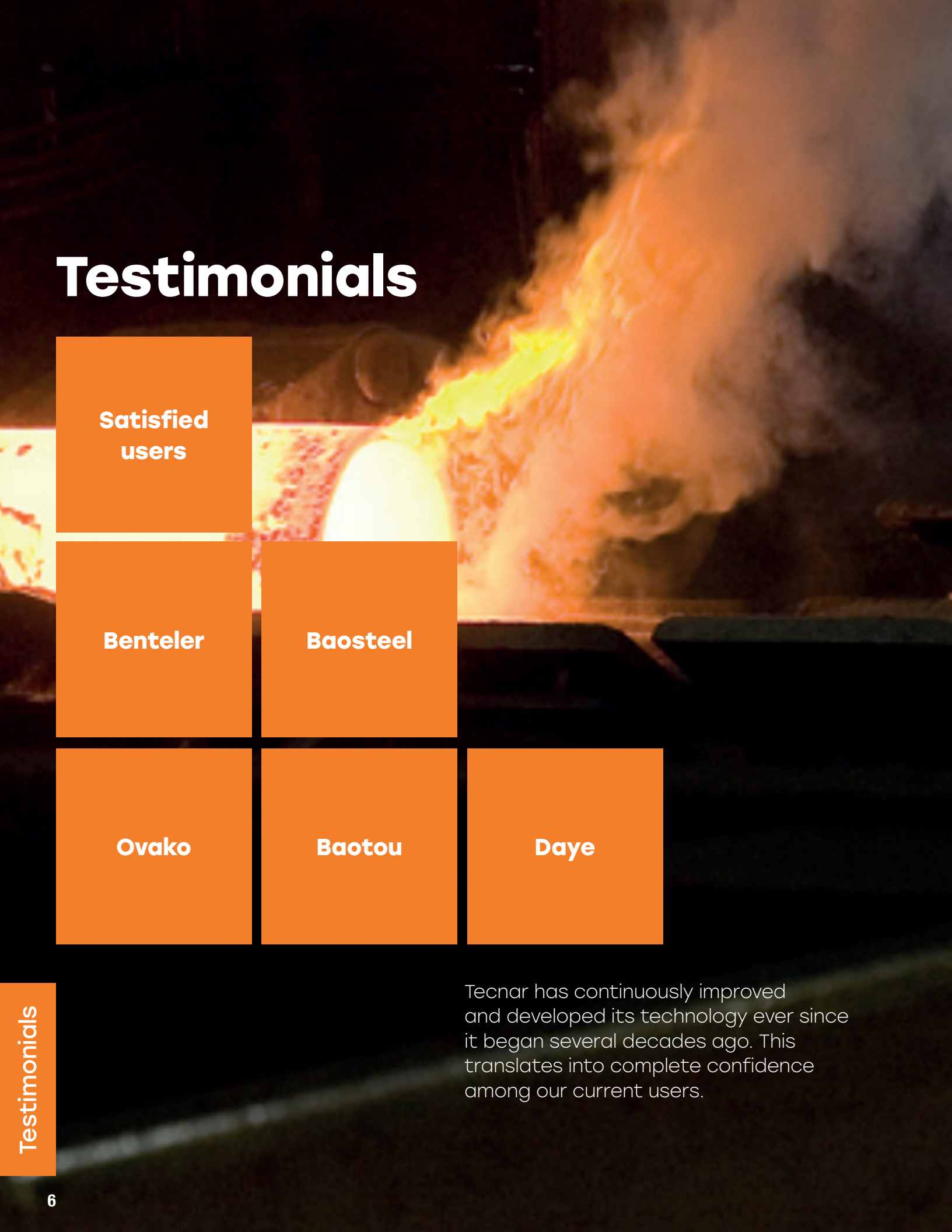
The only technology giving true wall thickness measurements.

Proprietary hardware

The Lut 2.0 core units are built around Tecnar's proprietary designs and engineered to achieve one goal: bulletproof reliability.

User-friendly software

Web-based interface and advanced analytical tools help track and improve your mill performances.



Testimonials

Satisfied users

Benteler

Baosteel

Ovako

Baotou

Daye

Tecnar has continuously improved and developed its technology ever since it began several decades ago. This translates into complete confidence among our current users.

Benteler

A family-owned company serving the automotive industry, and the mechanical engineering and energy sectors, has benefitted from the Lut since 2007.

Reliable and easy to maintain

“In 2017, we decided to replace our 2007 Lut with the new generation: the Lut 2.0. The main driver behind this decision was that the Lut 2.0 uses a diode-based laser that doesn’t require any flashlamp replacements and needs little maintenance. The system was installed in the fall of 2017. Since its commissioning, the system met our requirements for reliability, yielding industrial availability in excess of 98%.”

“After almost two years of operation, we at Benteler are very pleased with the Lut 2.0. We recommend the product to any seamless line that wants to improve productivity and achieve higher wall thickness tolerance on their product.”

M. Thomas Michels, COO, Benteler Group

Track and identify issues

Find sources of wall thickness eccentricity

Reliable

>98% industrial availability

Closed-loop feedback

Wall thickness control system

Ovako

Ovako is a leading European manufacturer of engineering steel, such as in bearings, for customers in the transportation and manufacturing industries.

Getting the most for your money

When the time came to replace their aging gamma ray thickness gauges on tube mill 4 & 5, Ovako chose the Lut 2.0 as their new standard for online thickness monitoring. Taking advantage of their cross-rolling sizing mill, Ovako installed two Lut 2.0 SPFs at the rotary sizers. This gave them full cross-sectional wall thickness measurement coverage and highly accurate eccentricity monitoring with a single probe.

“We are pleased with how our two Tecnar Lut gauges are working for us, but most of all we appreciate the responsiveness of the Tecnar team: They made sure every detail was taken care of during the commissioning.”

Erik Dandanell, Production Manager Hot Rolled Tubes, Ovako

Accurate eccentricity monitoring

by taking advantage of cross-rolling processes to get full surface coverage

Safer work environment

by replacing gamma ray gauges with Lut 2.0 units

Accurate thickness profile

vital for tube mills with short production lots and hundreds of product sizes

Baosteel

Baosteel, a state-owned company headquartered in Shanghai, China, is one of the largest steel companies in the world.

Innovative technology

In 2019, Baosteel took advantage of the Lut demonstration platform and performed a complete, long-term, evaluation of the Lut 2.0 SPF. The wall thickness gauge was installed at the exit of the mandrel mill at the seamless pipe factory in Shanghai, China. Tecnar's laser ultrasonic technology collected valuable data even with a mandrel bar inside the tubes, which is impossible for a radiometric-based system.

Based on the positive results of this demonstration, Baosteel adopted the laser ultrasonic technology and purchased a Lut 2.0 DPS after a competitive tender process. The installation was completed in December 2021. The Lut 2.0 DPS has been routinely providing valuable insight into the mandrell mill roll settings.

Floating mandrel mill

takes advantage of the Lut 2.0's compatibility with a mandrel

Earlier insights

provides information sooner in the manufacturing process

Highly accurate

wall thickness readings reveal relevant behavioural data from the tube mill

"The Lut 2.0 system was very effective at detecting minute variations in wall thickness while displaying a very good level of industrial availability."

Baosteel, 140 seamless pipe line

Baotou Steel

Baotou Steel, a state-owned enterprise in Baotou city, Inner Mongolia province of China, was founded in 1954 and today it is the largest steel enterprise in the region. Baotou Steel produces a wide range of iron and steel products and is the site of China's largest scientific research and production base of rare earth.

Better information. Better products

Baotou's No. 180 production line epitomizes a contemporary MPM mill designed for manufacturing tubes with wall thicknesses ranging from 4 to 27 mm and an outer diameter varying from 60 to 245 mm. The precise calibration of roll-stand settings is pivotal to ensuring high-quality production outputs. Integrating the Lut 2.0 at the mill's output gives the operator critical real-time information to keep production within specified tolerances and to promptly react to changing conditions.

The system's longitudinal wall thickness and eccentricity profiles quickly pinpoint potential heating or piercing issues. The high-resolution radial profile also offers critical insight into roll pressure dynamics to prevent overfill or underfill conditions. What's more, it helps to detect polygonization of the inner wall shape.

"One of the key information factors for us is to know which roll positions and which roll-stands to adjust. Tecnar's Lut 2.0 measuring at the outlet of the MPM mill provides this information." Baotou, Production line No. 180

High-radial resolution
Clear viewing of overfill or underfill conditions

User-friendly software
Early deviation tracking and cause identification

Advance profile analysis
Identification of sources of eccentricity

Daye Special Steel

Daye Special Steel, China's "cradle of steel", is located in Huangshi City, Hubei Province, the capital of mining and metallurgy and a major manufacturing region in China. Daye has a capacity of 8.3 million tons of steel and special steel. Among other things, it produces a wide variety of alloys and a wide range of high-end thick wall seamless steel pipes up to 100 mm wall thick.

Pushing boundaries

Overcoming the challenges of producing exceptionally heavy tubes requires a strategic approach. Daye has strategically invested in Tecnar's Lut system to enhance productivity and minimize material waste. The formidable task of measuring wall thickness, especially beyond 50 mm, made it extremely difficult to choose the right online thickness gauge. Tecnar embraced the challenge and brilliantly succeeded with the Lut 2.0. Its groundbreaking online wall thickness measurement capability can extend up to 90 mm for a wide range of steel grade alloys at the output of the sizing mill.

Daye and Tecnar engineers, working closely together, focussed on optimizing data collection, analysis, and presentation. This ongoing collaboration culminated in user-friendly tools tailored to mill operators, streamlining operations, and enhancing overall production efficiency.

Flexible operation mode
Lut 2.0 has two modes: fixed or scanning – to focus on difference sources of eccentricity

Material Loss Mitigation
True measurements to keep pipe within specifications

High accuracy
Hot tube characteristics at every stage, from furnace to cooling bed

"Manufacturing thick wall tubes and pipes is quite challenging. We chose Tecnar's dual probe scanner, the Lut 2.0 DPS, to get accurate and true measurements of hot tube wall thickness, eccentricity, length, and temperature in real time. Now we have the tool to identify the pipe characteristics to control, and to minimize the risk of important production loss from specification deviation." Daye Special Steel, Production line No. 460

Lut 2.0
Probe Scanner

Probe scanning device:

- High spatial resolution provides the most optimized cross-sectional profile possible
- Scanning unit completes an entire cross-sectional profile in under two seconds
- Three configurations available: single, dual or triple probe scanning
- Not affected by a mandrel
- Can be installed directly at the mill outlet
- Specifically designed for harsh environments
- Built to sustain direct tube impact
- Measurement probes automatically focus to the main rolling axis
- Small footprint: as little as 1,200 mm x 3,000 mm of floor space is required
- No tube guiding required
- Integrated turnkey equipment with all support systems included
- Automated height adjustment for centered and roll-resting pass line

Tube features measured

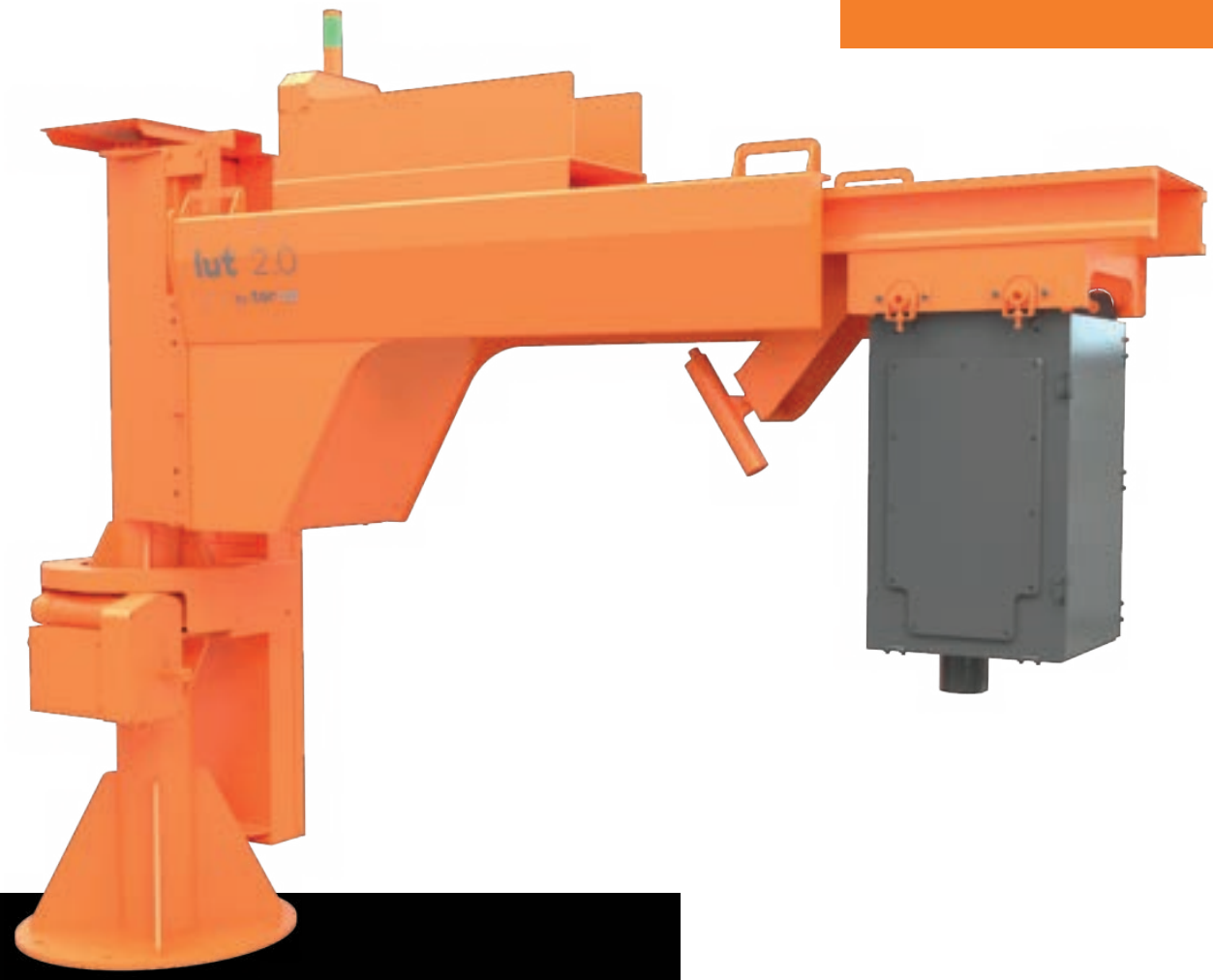
- Eccentricity - Heating & piercing
- Polygonization - Elongation*
- Tapered ends - Sizing
- Polygonization - Stretch-reducing
- Mean wall profile
- Min/Max wall profile

Scan QR code to get more information about the Lut 2.0 DPS

Lut 2.0
Single Probe Fixed

Probe positioning device:

- Modular online support structure is easily adapted to any production line
- Fully motorized support structure
- No modifications to the line are necessary
- Specifically designed for harsh environments
- Built to sustain direct tube impact
- Small footprint: as little as 500 mm x 500 mm of floor space is required
- No tube guiding required
- Integrated turnkey equipment with all support systems included



Tube features measured

Eccentricity - Heating & piercing

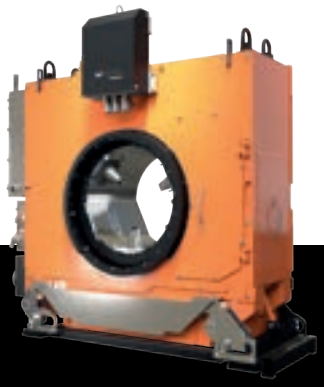
Tapered ends - Sizing

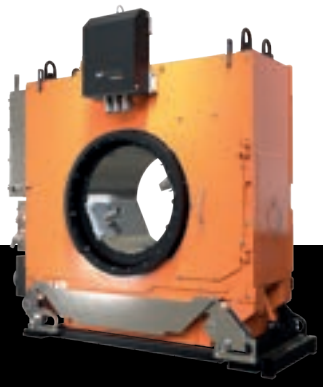
Mean wall profile

Min/Max wall profile

Scan QR code to get more information about the Lut 2.0 SPF

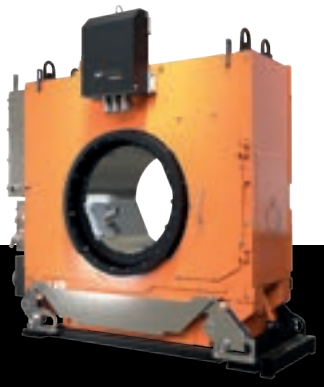
Technical specifications





	Lut 2.0 TPS Triple Probe Scanner	Lut 2.0 DPS Dual Probe Scanner
Recommended for	3-roll stands non-rotation mill	2-roll stand non-rotation mill
Adjustable angle probe position	√	√
Cross-sectional profile	√	√
Wall thickness measurement		
Range	3 to 50 mm	3 to 50 mm
Accuracy	±0.1 mm, for nominal WT ≤ 20 mm	±0.1 mm, for nominal WT ≤ 20 mm
	±0.2 mm, for nominal 20 mm < WT ≤ 30mm	±0.2 mm, for nominal 20 mm < WT ≤ 30mm
	±0.4 mm, for nominal 30 mm < WT ≤ 50 mm	±0.4 mm, for nominal 30 mm < WT ≤ 50 mm
	±0.5 mm, for nominal 50 mm < WT ≤ 60 mm	±0.5 mm, for nominal 50 mm < WT ≤ 60 mm
	±0.6 mm, for nominal WT > 60 mm	±0.6 mm, for nominal WT > 60 mm
Resolution	Better than 0.02 mm	Better than 0.02 mm
Steel grades	Any steel alloys, including stainless	Any steel alloys, including stainless
Tube outer diameter		
Range	25 mm to 570 mm**	25 mm to 570 mm**
Temperature measurement		
Range	600°C to 1200°C	600°C to 1200°C
Accuracy	± 2°C	± 2°C
Data acquisition		
Rate	Up to 300 data samples/sec.	Up to 200 data samples/sec.
Positioning	Any angle along the circumference of the tube	Any angle along the circumference of the tube
Scanner	2 sec. for complete cross-section	2 sec. for complete cross-section

* If tube is rotating ** 300 mm diameter span



	Lut 2.0 SPS Single Probe Scanner	Lut 2.0 SPF Single Probe Fix
Recommended for	Non-rotation slow-moving process mill	Rotating process mill
Adjustable angle probe position	√	
Cross-sectional profile	√	√*
Wall thickness measurement		
Range	3 to 50 mm	3 to 50 mm
Accuracy	±0.1 mm, for nominal WT ≤ 20 mm	±0.1 mm, for nominal WT ≤ 20 mm
	±0.2 mm, for nominal 20 mm < WT ≤ 30mm	±0.2 mm, for nominal 20 mm < WT ≤ 30mm
	±0.4 mm, for nominal 30 mm < WT ≤ 50 mm	±0.4 mm, for nominal 30 mm < WT ≤ 50 mm
	±0.5 mm, for nominal 50 mm < WT ≤ 60 mm	±0.5 mm, for nominal 50 mm < WT ≤ 60 mm
	±0.6 mm, for nominal WT > 60 mm	±0.6 mm, for nominal WT > 60 mm
Resolution	Better than 0.02 mm	Better than 0.02 mm
Steel grades	Any steel alloys, including stainless	Any steel alloys, including stainless
Tube outer diameter		
Range	25 mm to 570 mm**	> 25 mm
Temperature measurement		
Range	600°C to 1200°C	600°C to 1200°C
Accuracy	± 2°C	± 2°C
Data acquisition		
Rate	Up to 100 data samples/sec.	Up to 100 data samples/sec.
Positioning	Any angle along the circumference of the tube	Directly above the tube
Scanner	Fixed position or 4 sec. for complete cross-section	

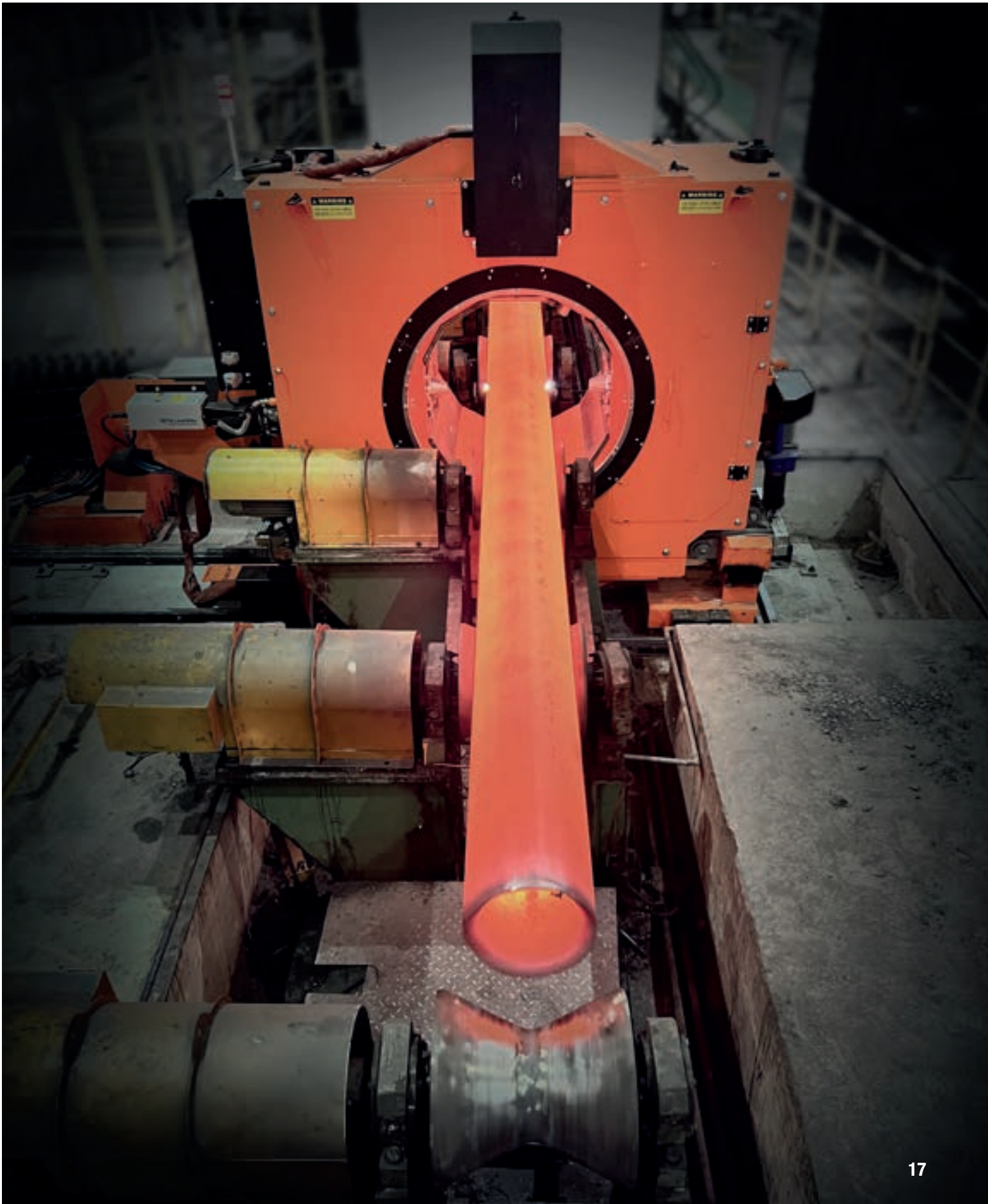
Get the Lut software advantage

The Lut 2.0 continuously monitors tube production to attain better mill yield through real-time communication with the plant's automation system. When the Lut 2.0 detects any deviations from set points, mill operators are automatically notified of the issue.

The Lut 2.0 user interface gives operators access to critical information such as:

- Tube profiles
- Radial cross sections
- Average values
- Production trends

Scan QR code to get more information about the software



Lut true data for daily use by plant operators and plant managers

A detailed, easy-to-read data interface gives operators and managers an overview of current production conditions. Batch trends, out-of-specification roll settings, or wall thickness deviation are easily seen on the Lut data display.

Accurate mean, minimum and maximum wall thickness profiles

Batch history

Full cross-sectional measurement

Individual tube profiles

Scan QR code to see real plant data

Transforming data into efficiency

Lut 2.0 is an innovative solution that takes conventional data collection to a whole new level. Its state-of-the-art dashboard gives operators a comprehensive real-time overview of production.

Leveraging Tecnar's two decades of expertise in online measurement, Lut 2.0 features sophisticated analytical tools, such as radial profile analysis and profile cycle analysis. These tools reveal important production conditions, such as the orientation of off-position rolls leading to polygonization, and distinguish between piercing and non-uniform billet heating eccentricities.

This advanced technology gathers data and transforms it into actionable insights so operators can proactively steer their production to even greater efficiency.

Elongation roll setting feedback

Eccentricity monitoring

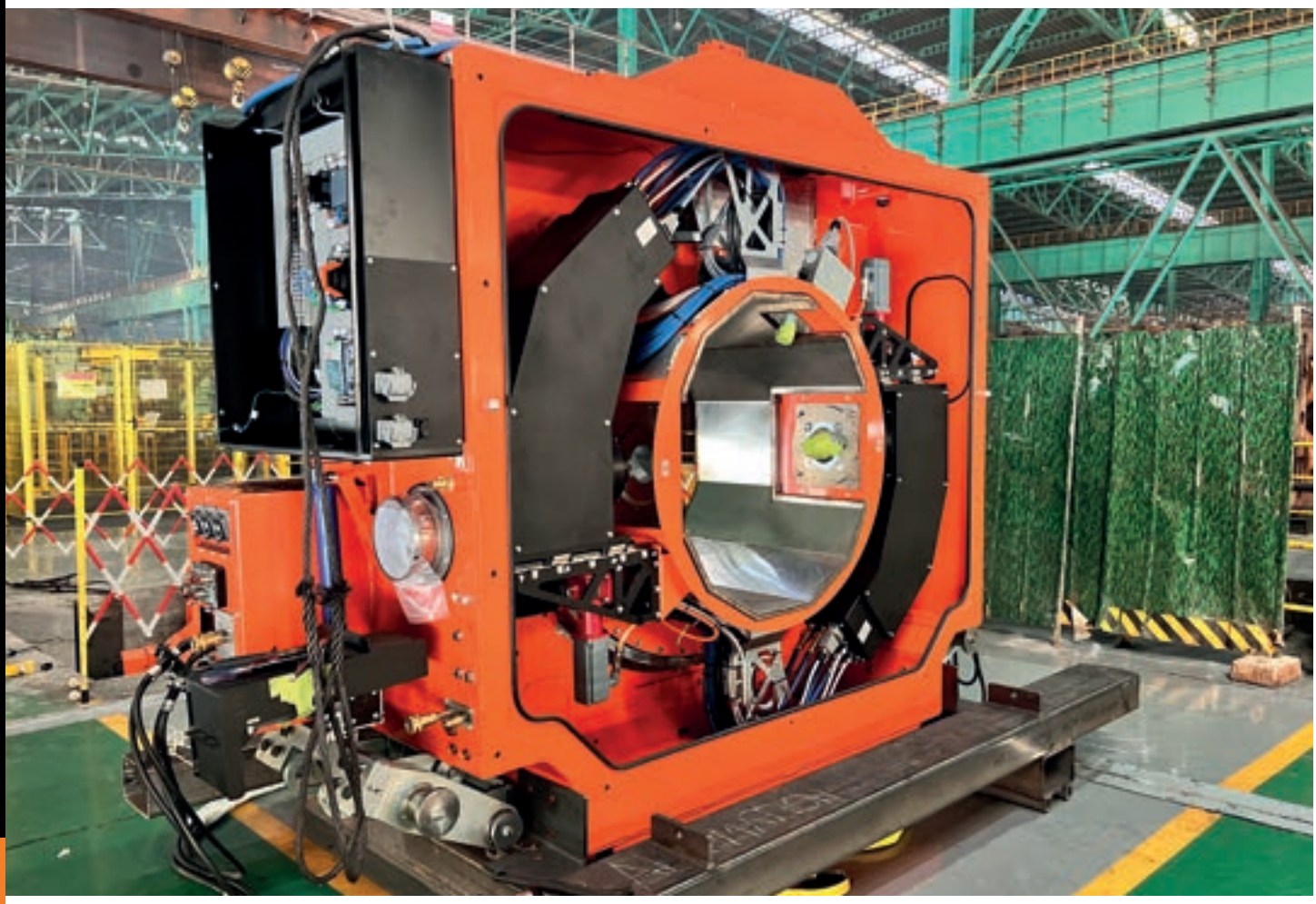
Detailed radial analysis

Scan QR code to see real plant data

Proprietary hardware

The Lut 2.0 is all about bulletproof reliability

To achieve this one goal, Tecnar has developed its own laser ultrasonic core units by leveraging the experience of over 25 Lut 1.0 gauges in more than 15 seamless tube mills around the globe. The Lut 2.0 is the next level in seamless tube wall thickness monitoring.



Marathon™ generation laser

The generation laser is the hammer that produces the ultrasound probing pulse. Located close to the hot pipe on the production line, the Marathon is the only heavy-duty laser specifically designed to work in this harsh environment.

Scan QR code to get more information about the Marathon generation laser

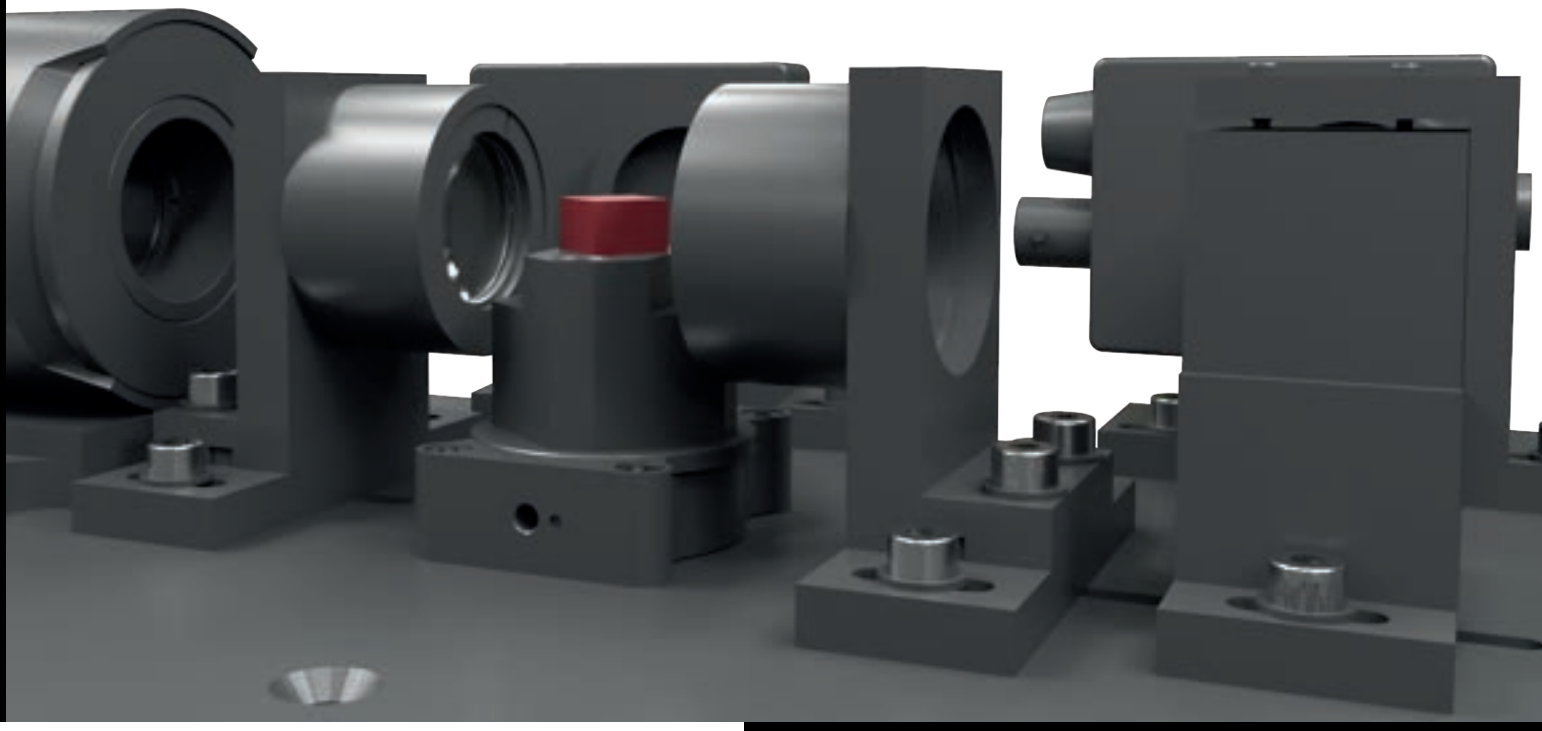
PDL 2.0™ detection laser

The detection laser is the eye that sees the ultrasound wave at the surface of the pipe. Tecnar's PDL 2.0 is the only high-power laser of its kind in the world.

Scan QR code to get more information about the PDL detection laser

TWM™ ultrasonic detector

The Lut 2.0 TWM detector, based on two-wave mixing technology, does not require active stabilization. It is naturally immune to ambient vibrations, making it especially well suited to the rough environment of seamless tube mills.



Scan QR code to get more information about the TWM ultrasonic detector

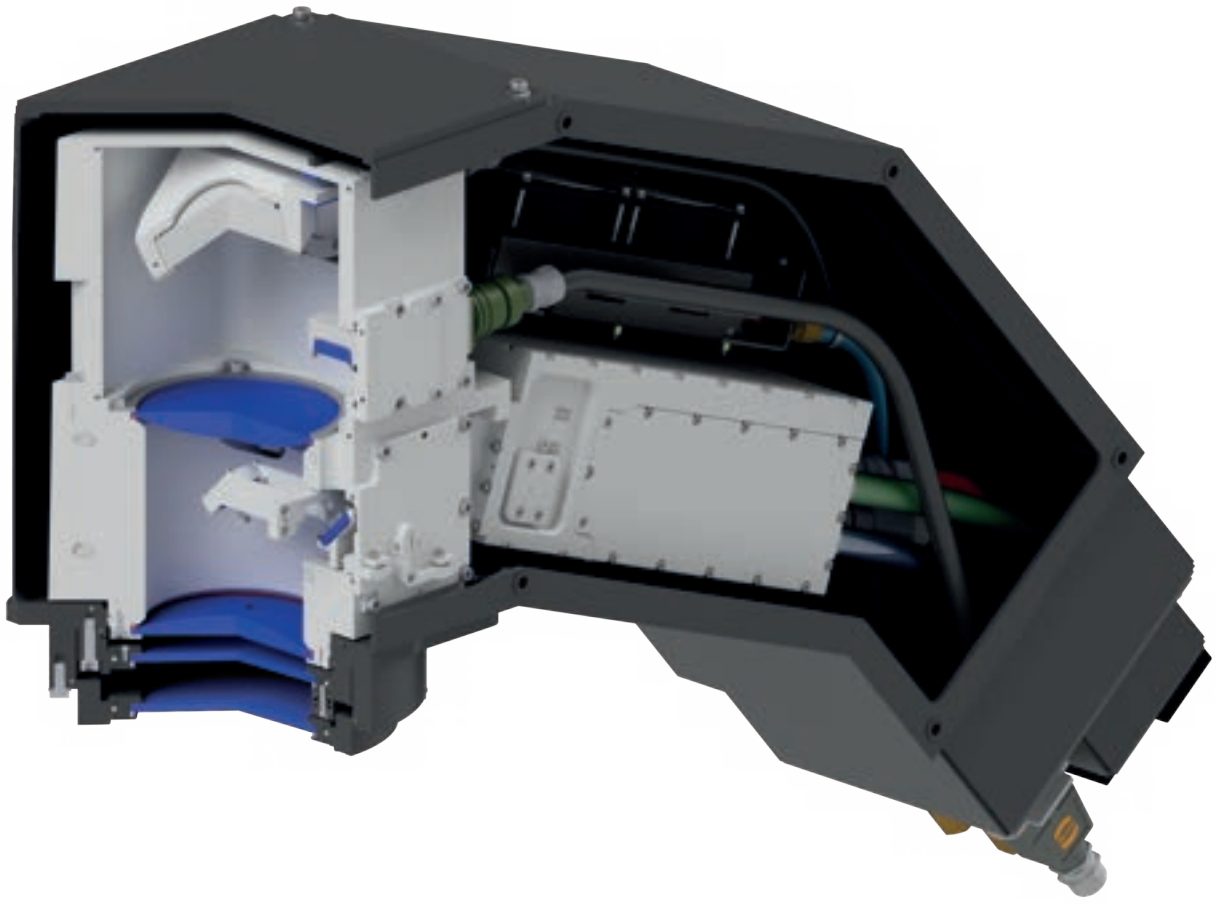
Durabeam™

Durabeam technology isolates all optical components from the environment while maintaining serviceability in the field, ensuring long-term reliability and low maintenance costs for the Lut 2.0 inspection probe.

Scan QR code to get more information about the Durabeam

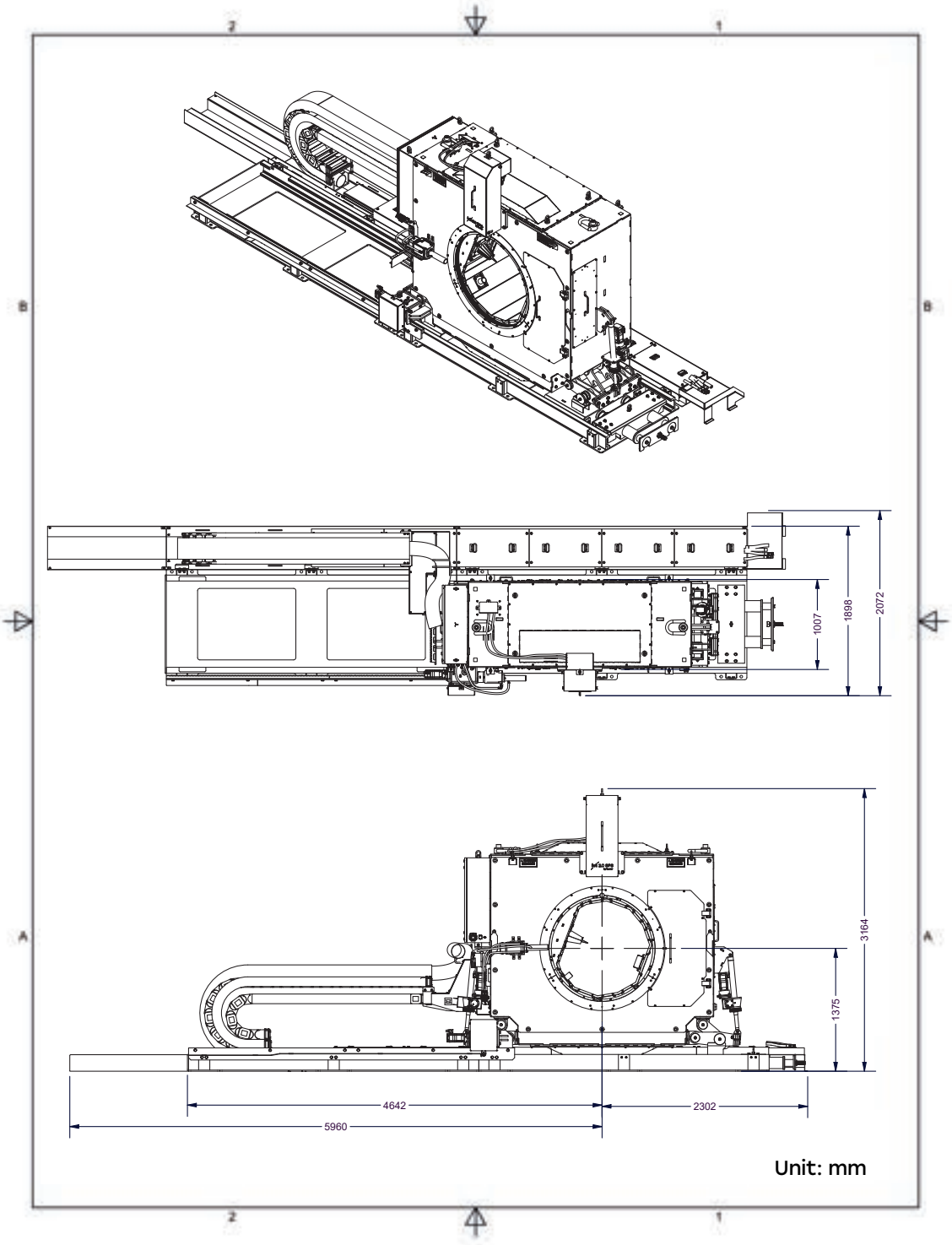
Inspection probe

This rugged, thermally insulated and water-cooled inspection probe can withstand the worst conditions in a seamless pipe mill. What's more, it's resistant to vibration, heat, water, dust and oil to keep working no matter what.

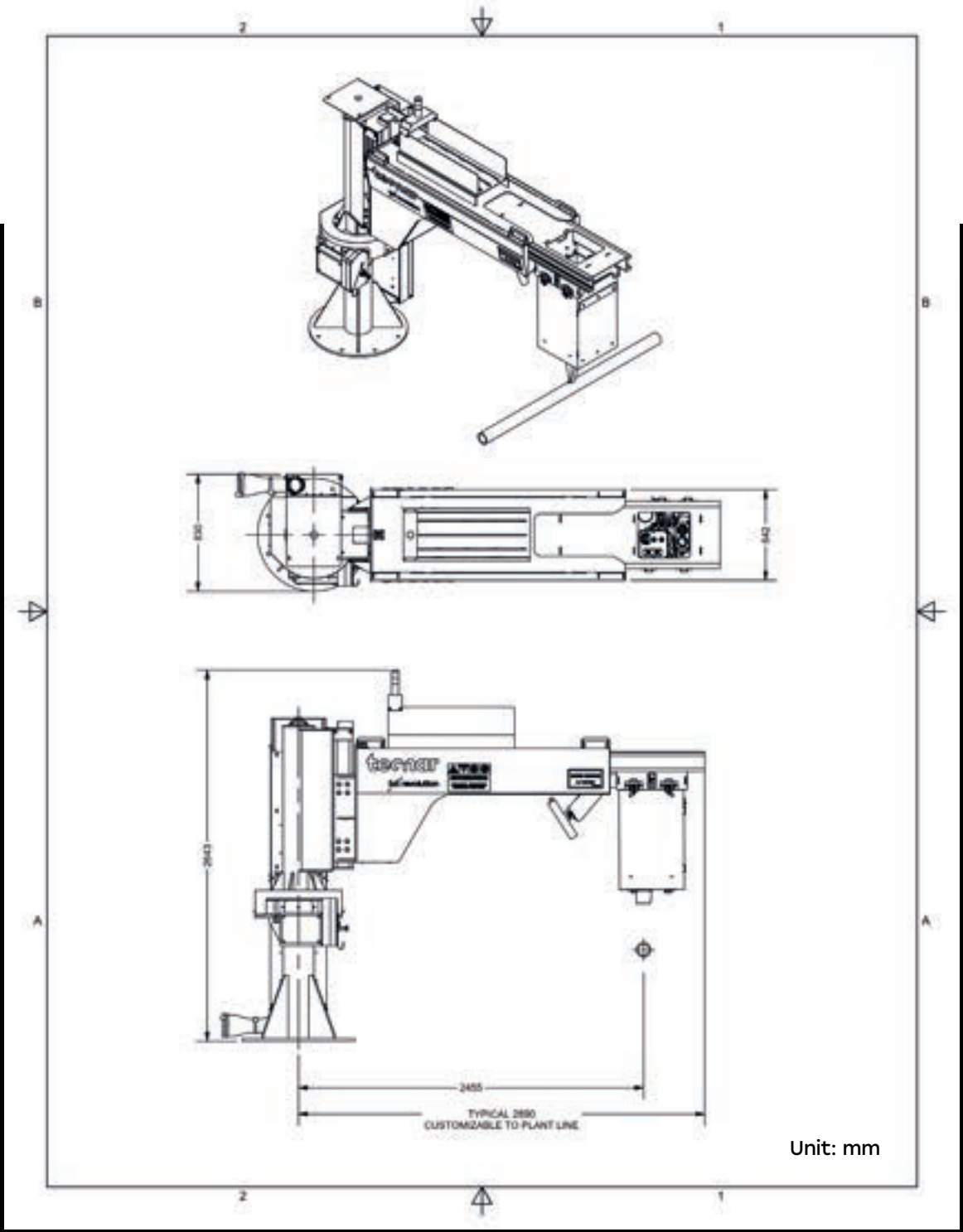


Scan QR code to get more information about the inspection probe

Lut 2.0 Probe Scanner



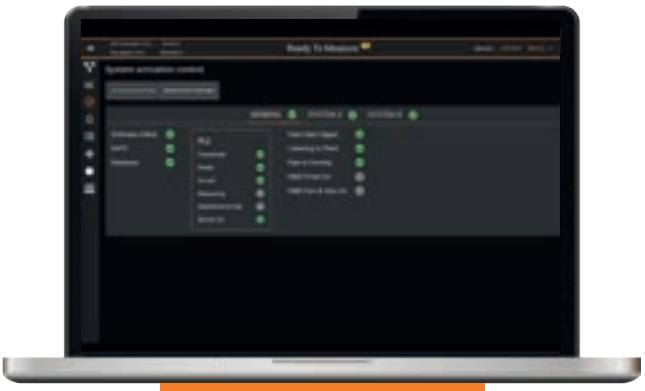
Lut 2.0 Probe Fixed



Unit: mm

Easy maintenance for daily use by plant operators

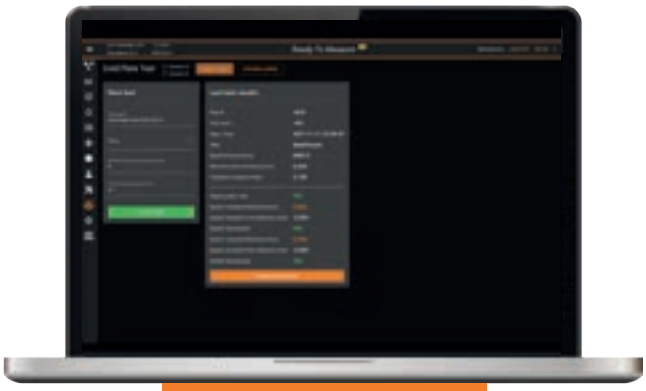
The Lut 2.0 is based on Tecnar's 20 years' experience in steel plants. The system's interface provides easy access to maintenance information and simple online instructions to address any issue.



Quick overview of system status

Simple instructions to address issues

Easy, routine maintenance scheduling



Integrated calibration validation

The ultimate wall thickness gauge for hot seamless tube mills

lut 2.0

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