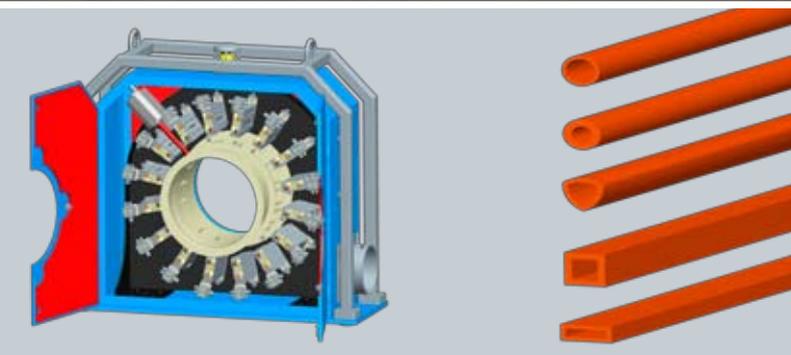


TubeProfiler™

True measurements of tubes and pipes



- *Full cross section and shape*
- *Straightness measurement*
- *Mill set up time dramatically reduced*
- *Improve product quality & yield*
- *Improve safety*
- *Immediate product and process feedback*
- *Certificate to end user*



Design for harsh conditions

LIMAB has many years of experience in manufacturing and supplying precision laser measuring systems for use in harsh environments found within steel plants. This knowledge is engineered into the TubeProfiler™ to ensure high accuracy with very low maintenance. The system is supplied with a high

performance air cooling system to ensure complete reliability of operation in the hot and dirty conditions that are normal for hot tube mills. The system will meet customer mechanical and electrical requirements for a perfect integration into any tube mill.

Design for accuracy

High precision sensors are at the heart of the TubeProfiler™ but to ensure an accurate system the design details of all the supporting components and equipment need to be carefully considered. This is where LIMAB's experience counts by paying close attention to the overall design.

Furthermore, the TubeProfiler™ uses our patented algorithm that eliminates errors due to tube movement in the measurement field.

TubeProfiler™ & TubeProfiler S™

System for accurate measurement of diameter, ovality, shape, length and straightness of tubes.

The TubeProfiler™ uses up to 36 synchronized laser triangulation sensors mounted on a circular base plate with the lasers directed to the centre of the wheel. The mounting angle between the lasers is from 10° degrees. Each laser precisely measures the distance to the tube.

The software incorporates a patented algorithm ensuring that the movement of the tube in the measuring field does not affect the measuring accuracy. This method gives a high number of very detailed and accurate cross sections which provides a much more detailed and extended analysis of the shape than a typical 4 or 6 axis shadow based measuring system. Furthermore this principle detects all oval, concave, convex and other surface defects.

The system incorporates an automated self centering mechanism to adjust the height of the measuring wheel to suit the mill pass line. A pyrometer measures the material temperature for hot to cold conversion of the measurements. An optional laser (Doppler) measures the tube length and allows the system to display the exact longitudinal defect position. A large remote display shows key measured values.

The TubeProfiler™ is suitable for small or large sized tubes and display the true cross section profile and provide min, max and average diameter, ovality, length, length waviness, flat spots and other size information. Suitable for measuring various shaped tubes including round, square and rectangle.

TubeProfiler S™ is an integrated diameter, ovality and straightness measurement system. The mechanical frame includes two additional measurement planes comprising of 4 to 8 sensors in each plane, measuring also the straightness, including tube ends, sections and entire tube.



Benefits

Full cross section shape measurement using high performance laser sensors which measures up to 36 points of the tube circumference.

Highest measurement rate available, for the maximum detail even on the fastest mills.

Complete cross section profile with no blind spots.

Instant recognition of rolling errors such as poor tube shape, roll eccentricity, flat spots, concave and convex surfaces, allowing operator to take immediate corrective action reducing scrap.

Mill setup time dramatically reduced between product changes, eliminating need for manually measuring of tubes.

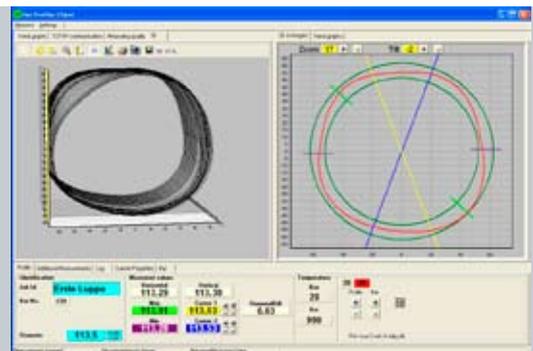
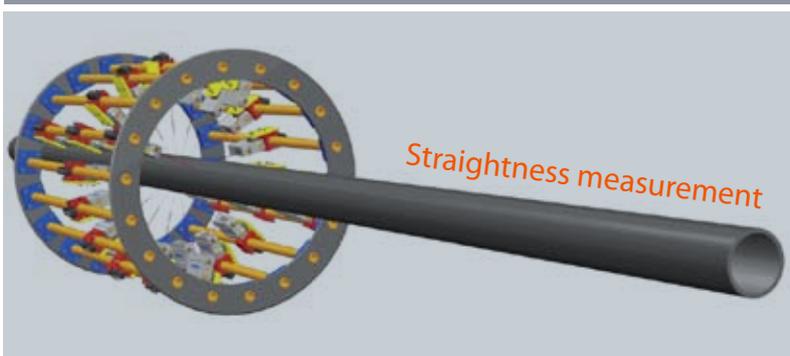
Straightness control avoiding tube reprocessing.

Complete scanning of the tube from end to end with tolerance checking, eliminates out of specification production, reducing scrap and increasing mill yield.

Process trend and data logging for 100 % quality control and process documentation.

Compact design makes it easy to install or relocate in new or existing rolling line.

Improve safety. Eliminates manual inspection of hot tubes.



Options

- Straightness measurement; (ends, sections and complete tube straightness)
- Length measurement
- Heat exchanger
- Lifting table
- Shifting table for off line position
- Big display

Software key features

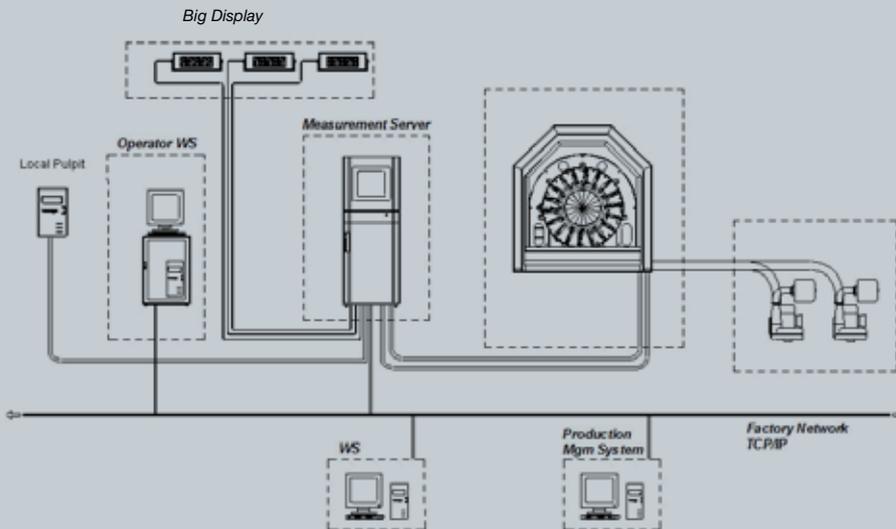
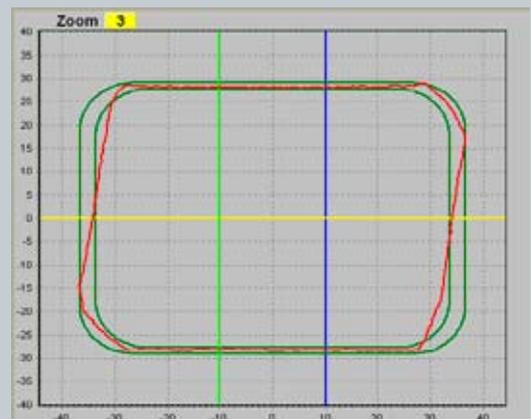
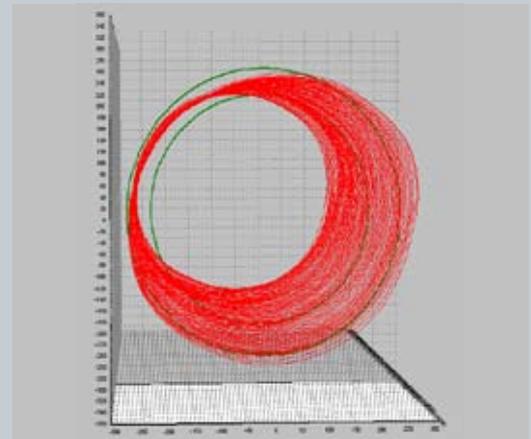
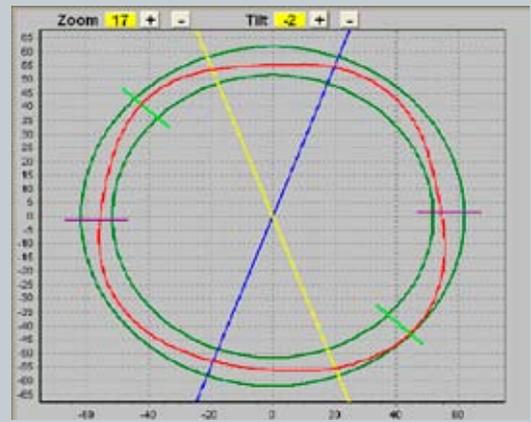
- 2D, 3D and trend graph presentation
- Numerical presentation of key figures
- Tolerance and alarm limits with on screen warnings
- System set-up
- Calibration
- Data logging for quality control
- Communication with level 2
- Remote service and supervision

Technical specifications

Profile examples

TubeProfiler™

Measurement objects	Hot/Cold seamless & welded tubes
Measurement range	Round, square, rectangular
Sampling rate	20–2500 mm
Profiles per second	Up to 72 kHz
Measurement system accuracy	Up to 2000
	From +/-0,01 mm @2σ
Laser sensor	PreciCura SR or MR
Laser class	2, 3R, 3B
Protection class	IP65
Sensor mounting frame	1500x1500x600 mm (typical)
Installation	Floor mounted



We reserve the right to introduce modifications without prior notice



LIMAB was founded 35 years ago and has a long tradition of producing laser sensors and complete non contact measuring systems to meet the needs of industry. The headquarters and manufacturing plant is located in Gothenburg, Sweden. LIMAB has regional offices in the USA, UK, Germany and Finland with distributors in other areas. LIMAB has over 30 years of experience in steel installations.



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