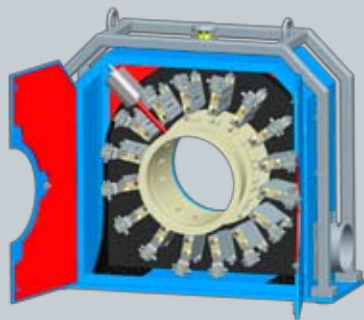


# TubeProfiler

## True measurements of tubes



- *Full cross section and shape*
- *Mill set up time dramatically reduced*
- *Improve product quality & yield*
- *Improve safety*
- *Measure all part of profile*
- *Immediate product and process feedback*



### Design for harsh conditions

LIMAB has many years 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

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

The TubeProfiler uses up to 18 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 20 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 highly detailed cross sections which provides a much more detailed analysis of the shape than a typical 4 or 6 axis shadow based measuring system. Furthermore this principle detects all concave and convex surface defects. The system incorporates an automated self centring 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. A large remote display shows key measured values.



## Benefits

Full cross section shape measurement using high performance laser sensors which measures up to 18 points around the circumference of the tube.

Highest measurement rate available today at up to 36kHz for the maximum detail even on the fastest mills.

Complete cross section profile measured with no missed areas

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

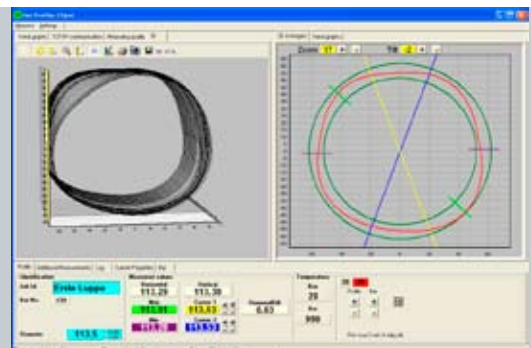
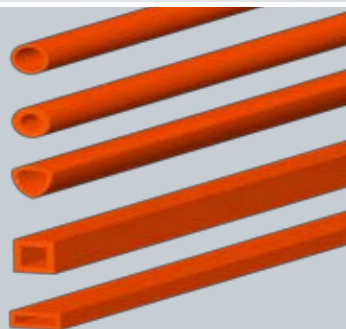
Mill setup time dramatically reduced between product changes, eliminating need for manually measuring of tubes.

Continuous through tube measurement and tolerance monitoring eliminates production of out of specification material increasing mill yield and reducing scrap.

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

Compact design makes it easy to install in new or existing rolling line. Can be easily relocated to new measuring locations if required.

Improve safety. Eliminates manual inspection of hot tubes by operators.



## Applications

The TubeProfiler is a multi-axis non contact mill gauge providing high accuracy cross section profile and shape measurement on hot or cold tubes. Suitable for small or large sized steel products the system will display the true cross section profile and provide min, max diameter, ovality, length waviness, length and other size information.

Suitable for measuring various shaped tubes including round, square, rectangle.

## 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

## TubeProfiler

|                             |   |
|-----------------------------|---|
| Measurement objects         | Hot/Cold tubes                                  |
| Measurement range           | Round, square, rectangular                      |
| Sampling rate               | 20–2000 mm                                      |
| Profiles per second         | 36 kHz  |
| Measurement system accuracy | 20  |
| Operating temperature       | from +/-0,03 mm @2σ<br>(depending on tube size) |
|                             | 0-40°C (without cooling system)                 |

## Cabinet and PC

|                  |                             |
|------------------|-----------------------------|
| Size             | 2000x600x600 mm             |
| Protection class | IP54                        |
| Operating system | Windows XP                  |
| Processor        | Core 2 Duo                  |
| Interfaces       | TCP/IP, RS232C, Digital I/O |

## Laser sensor

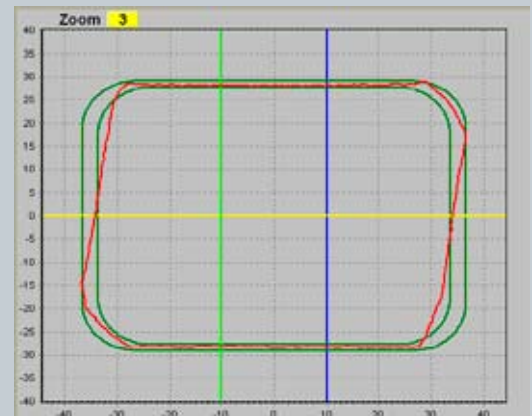
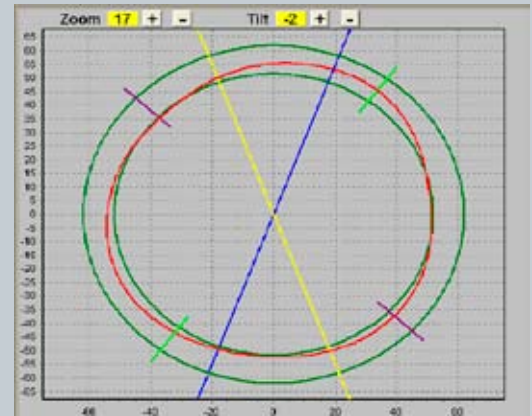
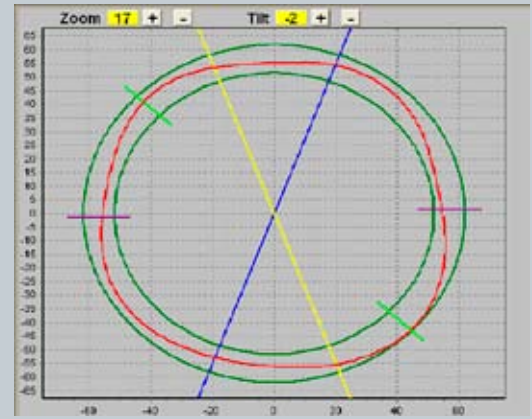
|                  |                         |
|------------------|-------------------------|
| Size             | PreciCura SR            |
| Laser class      | 162x108x42 mm           |
| Protection class | 3b (hot application)    |
| Interfaces       | IP65, NEMA 4X           |
|                  | Analogue, RS232, CanBus |

## Sensor mounting frame

|               |                             |
|---------------|-----------------------------|
| Installation  | 1300x1300x500 mm (typical)  |
| Encoder       | Floor mounted               |
| Lifting table | Incremental, CAN-Bus        |
|               | +/-200 mm vertical movement |

We reserve the right to introduce modifications without prior notice

## Profile examples



LIMAB were founded almost 30 years ago and have a long tradition of producing laser sensors and non contact measuring systems to meet the needs of the industry. Headquarters and manufacturing plant is located in Gothenburg, Sweden. LIMAB have regional offices in USA, UK, Germany and Finland and with distributors to cover other areas. LIMAB has over 20 years of experience in steel installations.



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