

# Press release

## Control News

### **Pioneering Length Metrology: Etalon presents an absolute measuring interferometer with up to 100 channels**

*The vision of self-correcting production becomes reality.*

Braunschweig/Germany, 19 February 2014 – In cooperation with University of Oxford, Etalon AG based in Braunschweig (Germany) developed the Absolute Multiline Technology for use in the precision measurement of lengths up to 20 m. This worldwide unmatched measuring technology combines the advantages of an interferometer (very high resolution, very good metrological traceability) with those of absolute measuring systems. Unlike conventional interferometers, the laser beam of the Absolute Multiline Technology can be interrupted at any time without causing precision loss.

Thanks to these worldwide unique system properties, the patented Absolute Multiline Technology takes metrology automation in production to a new level: Integrated in a large machine tool, the Absolute Multiline Technology continuously monitors machine calibration, and initiates compensating measures as needed to ensure the dimensional accuracy of the components. Even automated metrology monitoring of robots based on reference lines is possible. Moreover, the Absolute Multiline Technology can be used as global metrology system for monitoring the entire inline measuring technology of a production hall. Similarly, geometrical long-term monitoring of the dimensional stability of fixtures, as well as the detection of deformations and vibrations of (thermo-)mechanical systems such as generators, turbines or pressure containers, are conceivable.

"The principle of the Absolute Multiline Technology originates in the particle accelerator research," clarifies Dr.-Ing. Heinrich Schwenke, CEO of Etalon AG. "Our development team realized that this technology can also be applied to many industrial areas. It provides the foundation for machines and structures that are self-monitoring. Therefore, the Absolute Multiline Technology can also become a building block in the future concept of intelligent production."

#### **Traceability and accuracy**

The metrological traceability of the Absolute Multiline Technology is ensured by the reference to fundamental physical constants: In every measurement, the molecular absorption spectrum of a gas cell that stays constant over decades is scanned and the system is thus automatically recalibrated during every measurement. Comparison measurements using a conventional interferometer at the National Physical Laboratory in England confirmed a measurement uncertainty of 0.5 ppm (equivalent to 0.5 µm per meter) for distances between 0.2 m and 20 m.

## **Up to 100 measurement channels**

A single Absolute Multiline System can drive up to 100 measurement channels, depending on the system configuration. The channels are extremely compact: Each sensor consists of a commercial robust fiber and a miniature optical element without any electronic components. It can measure motions of an object with a resolution of over 500 kHz during one measurement interval. As the distance between the sensors and the system electronics can be several kilometers, it is possible to conduct measurements under extremely rough environmental conditions, far away from the evaluation electronics.

## **Technology applications**

Three renowned institutions already belong to the user community of Etalon's Absolute Multiline Technology: the RWTH University in Aachen (Germany), the European Organization for Nuclear Research (CERN), and Stanford University. Since then, industrial customers have also recognized the possibilities of this technology and ordered the system.

## **Presentation at the Control show**

Etalon AG will showcase the Absolute Multiline Technology at the Control show, from 6–9 May 2014, in Stuttgart/Germany (hall 3, stand 3215).

## About Etalon AG:

Etalon AG, founded as a spin-off from the PTB (Physikalisch-Technische Bundesanstalt) in 2004, offers complete system solutions for the calibration, monitoring and accuracy enhancement of machine tools and measuring machines. Innovative technologies have made Etalon products efficient and easy to handle. Highest accuracy ensures a clear advantage in a demanding environment. In the area of machine compensation, Etalon is an official Zeiss Business Partner as well as Siemens Solution Partner. Etalon's customers are from machine tool industry, metrology, automotive and aerospace industries, as well as from research sectors.

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