

Press release

Laser technology as a vector to develop Metrology 4.0

▶▶ *The “Laser for Manufacturing Lab” incorporates laser technology as a crucial tool for the metrology of the future*

(Eibar, Basque Country. 15 November, 2018).- The “Metrology 4.0” concept defines new metrology trends designed to meet the needs of the digital production environment based on achieving efficient production by using advanced, smart manufacturing and measuring processes. To achieve this goal it is essential to have production systems controlled by smart machine tools that optimise how manufacturing processes respond on the production line to guarantee the quality of end products, reduce production and other associated costs.

The digitisation of production processes and of the products and services resulting from these processes requires that “laboratory metrology” become “production process metrology” as it is in this scenario where opportunities can be found that metrology will have to address in the near future should it intend to become an enabling element for Industry 4.0.

In this regard, technology based on laser interferometry provides an efficacious tool for measuring processes and the characterisation of machine tools and other pieces of equipment, in addition to components and parts.

The “Laser for Manufacturing Lab” initiative by IK4-TEKNIKER pays special attention to the development of advanced inspection and measuring solutions used to check production resources prior to being commissioned, during the manufacturing process itself and as a means to control the quality of end products.

Laser pre-during-post production stages

In the case of high-range metrology, that is advancing thanks to a greater industrial demand and by the fact that increasingly larger components with more demanding dimensional requirements have to be manufactured, it has been found that laser interferometry is an outstanding ally.

Technologies such as Laser Tracker, Laser Tracer or interferometry are based on laser properties to measure with a high degree of accuracy and thus be able to **check** large equipment **prior to being used**.

Laser systems, moreover, can be used **during the production process for monitoring and control purposes**, to manufacture high precision products and reduce manufacturing uncertainty whenever large components are involved.

This is the area in which the technology centre has developed a process based on Laser Tracker technology and in-house software so that **large machines can be assembled quickly and accurately**. Compared to traditional technologies using devices such as bubble level gauges, laser distance measuring units, angle brackets or measuring tapes, this proposal has made significant progress.

Traditional methods allow relevant parameters to be measured directly whilst a machine is being assembled, but they also offer a local vision that slows the process down whenever large machine tools are involved and this only increases costs.

But all of these difficulties can be overcome by using the unique the Laser Tracker system that measures all the features to be monitored whilst a machine tool is being assembled (levelling, height, straightness, parallelism, positioning and dynamic assistance for erection).

In fact, Laser Tracker offers advantages such as greater accuracy and an overall view of how the assembly process of a machine tool is actually taking place. It also provides dynamic assistance for erection work thanks to the fact that bodies can be controlled in real time and because the process has been automated.

For purposes of technological transfer, IK4-TEKNIKER has also developed customised software materialising the knowledge of the technology and the erection process of a large machine tool. This makes it easier for technical staff in charge of erection work to use the Laser Tracker technology.

In summary, IK4-TEKNIKER's track record in the use of the Laser Tracker technology has not only made it possible to include this technique in the value chain, but also offer machine tool manufacturers high added value solutions and a competitive advantage.

As regards the Laser for Manufacturing Lab, IK4-TEKNIKER has set its sights on short-range solutions such as triangulation, structured or confocal light or flight time so that the laser can be used for **the final inspection, measure the manufactured part** and guarantee end quality.

As well as other solutions such as ENAC certification and calibration, verification, 3D calibration and checking, manufacturing and turnkey delivery of scientific and measuring equipment.

Metrology 4.0 and laser technology, a successful binomial

Laser-based inspection and measuring technologies can be applied in diverse sectors such as aeronautics, automotive, biomedicine, renewables, machine tools and manufacturing.

The digitisation of production processes and in-process quality control require that inspection and measurement solutions be incorporated to the manufacturing process itself, not only to perform on-site quality control, but to also digitise a manufacturing process on a real time basis. In this manner, attempts can be made to automate decision-making and thus tend towards "zero defect" production.

Concerning IK4-TEKNIKER

With more than 35 years of experience in applied technology research that has been transferred to companies, IK4-TEKNIKER has achieved a high degree of specialisation in four major areas (Advanced Manufacturing, Surface Engineering, Product Engineering and ICTs). This means that its cutting edge know-how has been made available to customers to meet their requirements.

Further information

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