



## Automated Metrology Solution for Accurate and Repeatable Surface Inspection

*By collaborating with Fusion for Energy (F4E), Metromecánica has designed and validated an automated robotic system for precision dimensional control of gaps and steps in complex, curved assemblies. Originally developed for Inner Vertical Targets (IVT) in fusion reactors, the solution offers robust performance in environments where dimensional control and traceability are critical.*

### The development

The development combines advanced laser sensors, collaborative robotics, and custom metrology software. This system ensures fast, consistent, and highly accurate inspection of tiled or modular components, with potential for adaptation to various industrial and research settings. The inspection solution integrates:

- A UR-series collaborative robot, with pre-programmed measurement paths via simulation tools
- A Vectro2 laser sensor with T15 head from Thirdimension, for non-contact surface inspection of small-scale features.
- Software tools including SPC3D and Agile3D, supporting point cloud processing, trajectory correction, and automatic report generation.

### Advantages and Potential Applications

- **Validated under fusion-relevant conditions** with strict tolerances and complex geometries.
- **Fast, repeatable, and fully automated**, reducing manual errors and inspection time.
- **Flexible and reconfigurable**, adaptable to different components and inspection protocols.
- **Ideal for inspecting modular assemblies, heat exchangers, precision panels, tiles, or castings** where surface uniformity and alignment are key.

### Collaboration opportunities

Metromecánica offers this advanced metrology system to companies and institutions working in fusion, aerospace, precision manufacturing, and other sectors requiring accurate, traceable, and repeatable surface inspection.

Its flexibility makes it suitable for any industry dealing with complex geometries or strict tolerances, such as in vacuum components, turbine parts, or modular assemblies.

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