

# **THE IMPORTANCE OF METROLOGY FOR PROCUREMENT CONTRACTS AND INSTALLATION ACTIVITIES FOR ITER**

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**ABSTRACT:** In order to guarantee the required performances of the ITER tokamak, stringent geometrical and dimensional requirements have been defined for guiding the manufacturing and assembly of the core components of the machine, like the Toroidal Field (TF) coils and the Vacuum Vessel (VV) sectors.

The manufacturing of the European Magnets and the Vacuum Vessel sectors are currently under the responsibility of two Italian companies: SIMIC SpA, for the TF coils, and the Ansaldo Mangiarotti Walter Tosto (AMW) consortium for the VV. Both contracts are managed by Fusion For Energy, the European Union organization managing the Europe's contribution to the ITER project.

Having integrated metrology-related aspects since the first engineering/design phases of the product life-cycle has demonstrated to be a key decision for ensuring the highest possible quality for the final products and meeting the stringent tolerance requirements.

This has allowed to improve the quality of design drawings by considering both manufacturability and inspectability aspects since the first phases, by rationalizing tolerance requirements and improving consistency of the references. Specific metrology guidelines have been implemented aiming at defining and tracing the whole process, assuring reliable results in terms of uncertainty of the measurement, together with specific working instructions to implement an usage of the different metrology equipment (e.g. Laser tracking, photogrammetry..) at the highest possible technical standards

This article aims at introducing the main metrology methodologies, controls and analyses implemented from the beginning up to the end of the engineering and manufacturing processes, giving an overview of the technologies and strategies adopted.