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Assembly and final dimensional inspection at factory of the JT60-SA Cryostat Vessel Body Cylindrical Section

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The JT-60SA project, a superconducting tokamak developed under the Satellite Tokamak Programme of the Broader Approach Agreement between EU and Japan and of the Japan Fusion National Programme, is progressing on schedule towards the first plasma in 2020. Within the European contribution to JT-60SA, Spain is responsible for providing JT-60SA cryostat.

The JT-60SA cryostat is a stainless steel vacuum vessel (14m diameter, 16m height) which encloses the tokamak providing the vacuum environment (10^{-3} Pa). It must withstand the external atmospheric pressure during normal operation, and internal overpressure in case of an accident (0.12 MPa absolute). The cryostat design is subdivided, for functional purposes, in two large assemblies: the Cryostat Vessel Body Cylindrical Section (CVBCS) and the Cryostat Base (CB). For transport and assembly reasons the cryostat is made up of 20 main parts: 7 making up the CB and 13 making up the CVBCS (including the top lid). All of the joints between them rely on bolted flanges together with light seal welds, non-structural fillet welds performed from inside and/or outside of the cryostat. The single wall is externally reinforced with ribs to support the weight of all the ports and port plugs and also to withstand the vacuum pressure. The material SS 304 ($\text{Co} < 0.05 \text{ wt\%}$) with a permeability (μ_{rel}) below 1.1. The CVBCS is made of a single wall stainless steel shell with a thickness of 34mm. The CB was manufactured and assembled in-situ in 2013, while the CVBC was manufactured by a Spanish company (ASTURFEITO S.A) and delivered to Japan in November 2017.

This paper summarizes the assembly and final dimensional inspection at factory of the JT-60SA CVBCS.

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