

Abstract Submitted
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IGNITOR Plasma Chamber Assembly Procedure and Welding Processes* G. TOSELLI, G. BARBIERI, B. CARMIGNANI, G. CELENTANO, F. COGNINI, A. CUCCHIARO, U. DE MAIO, A. IERINO, T. MINGHETTI, G. PANZANI, S. SANGIORGI, M. TIMPANARO, D. TRESTINI, D. VISPARELLI, ENEA, Italy, B. COPPI, MIT — The appropriate welding techniques to be adopted for the assembly sequences of the 12 sectors of the Plasma Chamber, are described. The last welds, joining two assembled 180° sectors of the plasma chamber, need to be carried out automatically, at the inside of the Chamber, guided and controlled by the remote handling system. The deformations and the displacements due to these welds have to be very limited in order to comply with the design geometry of the closed torus and its functions (e.g. support of the First Wall structure). Numerical simulation of the relevant welding processes have been carried out. Two different welding techniques have been chosen.

–Laser welding for the junction of 4 mm of the thickness of adjacent sectors of the plasma chamber

–TIG-NG welding with filler material for the remaining thickness

Experimental tests and corresponding simulations have been made, for both of these welding processes, on suitable samples which reproduce some aspects and geometrical characteristics of the chamber sectors. The most significant results obtained are described and discussed.

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