

Abstract Submitted  
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**IGNITOR Plasma Chamber Assembly Procedure and  
Welding Processes\***

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M.I.T. — The appropriate welding techniques to be adopted for the  
assembly sequences of the 12 sectors of the Plasma Chamber, are de-  
scribed. The last welds, joining two assembled 180° sectors of the plasma  
chamber, need to be carried out automatically, at the inside of the Cham-  
ber, guided and controlled by the remote handling system. The defor-  
mations 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 sim-  
ulation 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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