The breeding blanket box is considered as one of the most important components of a future fusion power plant. It will be assembled by so called cooling plates (CP) with a system of internal cooling channels. Such a CP is produced by two symmetric half pieces with half milled-in channels. Both pieces will be joined by a diffusion weld (DW) process. Within recent years a two step DW process for different EUROFER batches has been developed. It has been first applied to small laboratory scaled samples with dimensions of 25 mm x 30 mm x 40 mm. Then the DW process had then been successfully transferred to so called compact mock ups which are small CPs with dimensions of 67 mm x 70 mm x 50 mm. As third step this process has been used to manufacture a CP (465 mm x 205 mm x 50 mm) of a breeder unit in an industrial uniaxial diffusion weld setup.

This paper treats the manufacturing sequence of a cooling plate and a first wall mock up in an industrial hot isostatic pressing (HIP) setup. The firstly laboratory specimens scaled diffusion weld process has been adjusted to different cooling channel dimensions and a different DW setup. The weld quality is investigated by tensile and Charpy impact testing. This allows comparison of the weld quality of mock ups welded in different DW setups.