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## Status of the EU DEMO breeding blanket manufacturing R&D activities

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The realization of a DEMOnstration Fusion Power Reactor (DEMO) to follow ITER, with the capability of generating several hundred MW of net electricity and operating with a closed fuel-cycle by 2050, is viewed by Europe as the remaining crucial step towards the exploitation of fusion power. The EUROfusion Consortium, in the frame of the European Horizon 2020 Program, is assessing four different breeding blanket concepts in view of selecting the reference one for DEMO. This paper describes technologies and manufacturing scenarios developed and envisaged for the four blanket concepts, including nuclear “conventional” assembly processes as TIG, electron beam and laser welding, Hot Isostatic Pressing (HIP), and also more advanced (from the nuclear standpoint) technologies as additive manufacturing techniques.

With regard to welding processes, topics as the metallurgical weldability of EUROFER steel and the associated risks or the development of appropriate filler wire are discussed.

The development of protective W-coating layers on First Wall, with Functionally Graded (FG) interlayer as compliance layer between W and EUROFER substrate, realized by Vacuum Plasma Spraying method, is also propounded. First layer systems showed promising layer adhesion, thermal fatigue and thermal shock properties. He-cooled mock-ups, representative of the First Wall with FG W/EUROFER coating will be fabricated for test campaigns in the HELOKA facility under relevant heat fluxes.

First elements of Double Walled Tubes (DWT) manufacturing and tube/plate assembly for the water cooled concept are given, comprising test campaign aiming at assessing their behaviour under corrosion.

Developments described in the paper are performed in conformity with international standards and/or design/manufacturing codes.

Eventually, further development strategies are suggested.

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