A conceptual first wall is designed, fabricated and tested in the paper. There is nothing to do with the engineering design and test on a first wall for DEMO;

A conceptual first wall has a sandwich-like structure, which consist of a reduced activation ferritic/martensitic (RAFM) substrate, an interlayer and plasma facing material of tungsten by chemical vapor deposition (CVD-W) due to its characteristics of high density, high purity and better thermal shock resistance.

The interlayer is required to have good adhesion between CLF-1 and CVD-W and tritium prevention due to the great importance of controlling the tritium buildup in the first wall, improving the fuel efficiency and conforming to the safety regulation of tritium.

Different interlayers including Ni, TiN and SiC are designed and fabricated. The effects of the different materials, thicknesses, and fabrication processes are evaluated.

The sandwich-like samples have been tested and the results show that only the TiN interlayer made by CVD has sufficient adhesiveness as an interlayer between CVD-W and CLF-1 so far.