

PRELIMINARY DEVELOPMENT ON A CONCEPTUAL FIRST WALL FOR DEMO

- 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.