

## **Status of Tritium Permeation Barrier Development in the EU**

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Tritium permeation can be significantly reduced by a suitable barrier on the structural materials of a future fusion power plant. Since alumina has the capability of tritium permeation reduction, the development of such coatings on ferritic martensitic steels by different techniques like hot-dip aluminising (FZK), vacuum plasma spraying (JRC Ispra) and chemical vapour deposition (CEA) was funded by the EU during the last 10 years. The final objective was to identify a so-called reference coating for structural components of the WCLL blanket.

The presentation describes the process specific and the results of the corresponding hydrogen permeation measurements, performed at ENEA, Brasimone, Italy. Only the results for CVD and HDA coating show clearly, that the required PRF values of  $> 1000$  in  $H_2$  gas were sufficiently exceeded, but lower values were obtained in the Pb-17Li environment. The post mortem analysis showed that surface defects and spallation of parts of the coatings were responsible for the low PRF's. The reason for this behavior is not fully clear at the moment and needs additional investigations. Funding of the EU regarding the R&D activities was postponed in 2002, until finishing of the evaluations of further needs for tritium permeation barriers after the redesign of the european blanket concepts.