

TWIN ASTIR: AN IRRADIATION EXPERIMENT IN LIQUID Pb-Bi EUTECTIC ENVIRONMENT.

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The Twin Astir irradiation program, currently under irradiation in the BR2 reactor at SCK-CEN is aimed at determining the separate and possibly synergetic effects of a liquid lead bismuth eutectic (LBE) environment and neutron irradiation. It will lead to a parametrisation of the key influencing factors on the mechanical properties of the candidate structural materials for the future experimental Accelerator Driven System.

The experiment consists of six capsules containing mainly mini tensile samples and one capsule containing mini DCT's. Three of the tensile containing capsules and half of the DCT containing capsule are filled each with approximately 20 ml of low oxygen (10^{-6} wt%) LBE. To complete the filling of these capsules with LBE under controlled conditions a dedicated filling installation was constructed at SCK-CEN. The other three tensile containing capsules are subjected to PWR water conditions, in order to discriminate the effect of PbBi under irradiation from the effect of the irradiation itself. To extract the effect of the PbBi corrosion itself on the material properties, one of the capsules is undergoing the thermal cycles of the BR2 reactor without being subjected to irradiation. This results in a matrix of three irradiation doses in LBE (0, 1.2 and 2.5 dpa) and two environments (PbBi and PWR water conditions).

The detailed concept of the Twin Astir project will be described as well as the materials under irradiation. We will give an overview on our experience with the experiment.