

VALIDATION OF THE SHEAR PUNCH-TENSILE CORRELATION TECHNIQUE USING IRRADIATED MATERIALS - G. L. Hankin and R. G. Faulkner (I.P.T.M.E., Loughborough University, Leicestershire, LE11 3UT, UK) M. B. Toloczko (Washington State University) and M. L. Hamilton (Pacific Northwest National Laboratory)*

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EXTENDED ABSTRACT

It was recently demonstrated that tensile data could be successfully related to shear punch data obtained on transmission electron microscopy (TEM) discs for a variety of irradiated alloys exhibiting yield strengths that ranged from 100 to 800 MPa. This implies that the shear punch test might be a viable alternative for obtaining tensile properties using a TEM disk, which is much smaller than even the smallest miniature tensile specimens, especially when irradiated specimens are not available or when they are too radioactive to handle easily.

The majority of the earlier tensile-shear punch correlation work was done using a wide variety of unirradiated materials. The current work extends this correlation effort to irradiated materials and demonstrates that the same relationships that related shear punch tests remain valid for irradiated materials. Shear punch tests were performed on two sets of specimens. In the first group, three simple alloys from the ^{59}Ni isotopic doping series in the solution annealed and cold worked conditions were irradiated at temperatures ranging from 365 to 495°C in the Fast Flux Test Facility. The corresponding tensile data already existed for from tensile specimens fabricated from the same raw materials and irradiated side-by-side with the disks. In the second group, three variants of 316 stainless steel were irradiated in FFTF at 5 temperatures between 400 and 730°C to doses ranging from 12.5 to 88 dpa. The specimens were in the form of both TEM and miniature tensile specimens and were irradiated side-by-side.

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