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Suitability of TZM as an ISIS Target Cladding Material

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The ISIS Facility uses a Tantalum clad Tungsten target in order to produce neutrons which facilitates unique and innovative research. The properties required for a material to qualify as a potential target material are strict, resulting in scarce options. Often these materials are very expensive due to their rarity and are also very difficult to work with from a machining and manufacture perspective. Due to this, any material that is deemed to potentially fit the criteria should be investigated. TZM, a Molybdenum alloy is one such material put forward by the Target Design Group.
To ascertain its credibility, an in-depth investigation was carried out, firstly, researching the properties of the material, focusing on those most relevant to the criteria of a target material. Secondly, testing its manufacturability, using the machining techniques available to the Target Manufacture Facility, to compare the optimum parameters found for machining TZM against the known parameters for Tantalum.
This talk will cover an overview of the research and the in-depth practical analysis carried out, with comparisons to our current cladding material, along with the results and conclusions drawn from said analysis.

Primary author: PROTHERO, Alan (STFC)

Presenter: PROTHERO, Alan (STFC)

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