A Proposal to Measure the Properties of Tungsten after 800 MeV Proton Irradiation at ISIS

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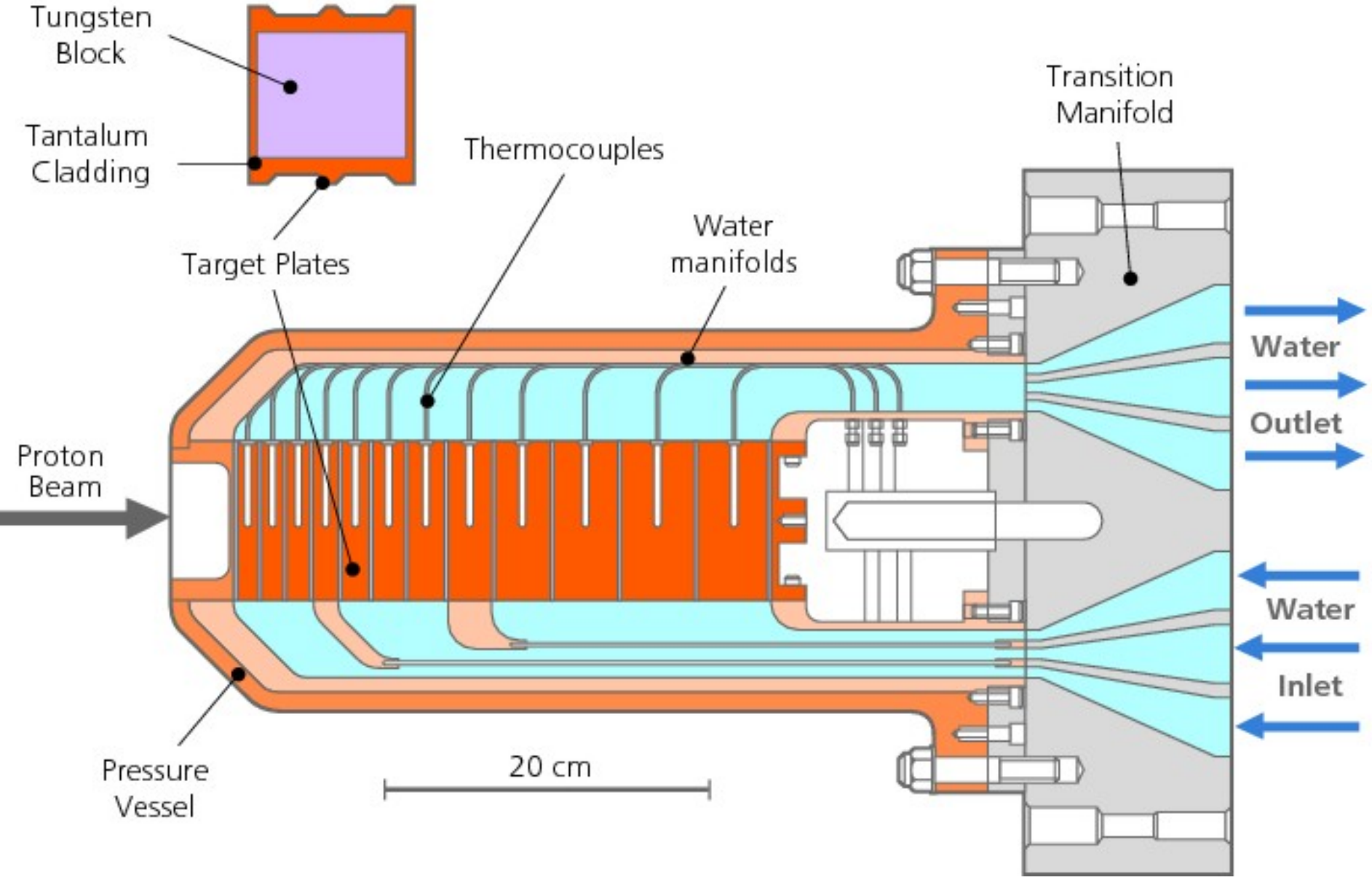
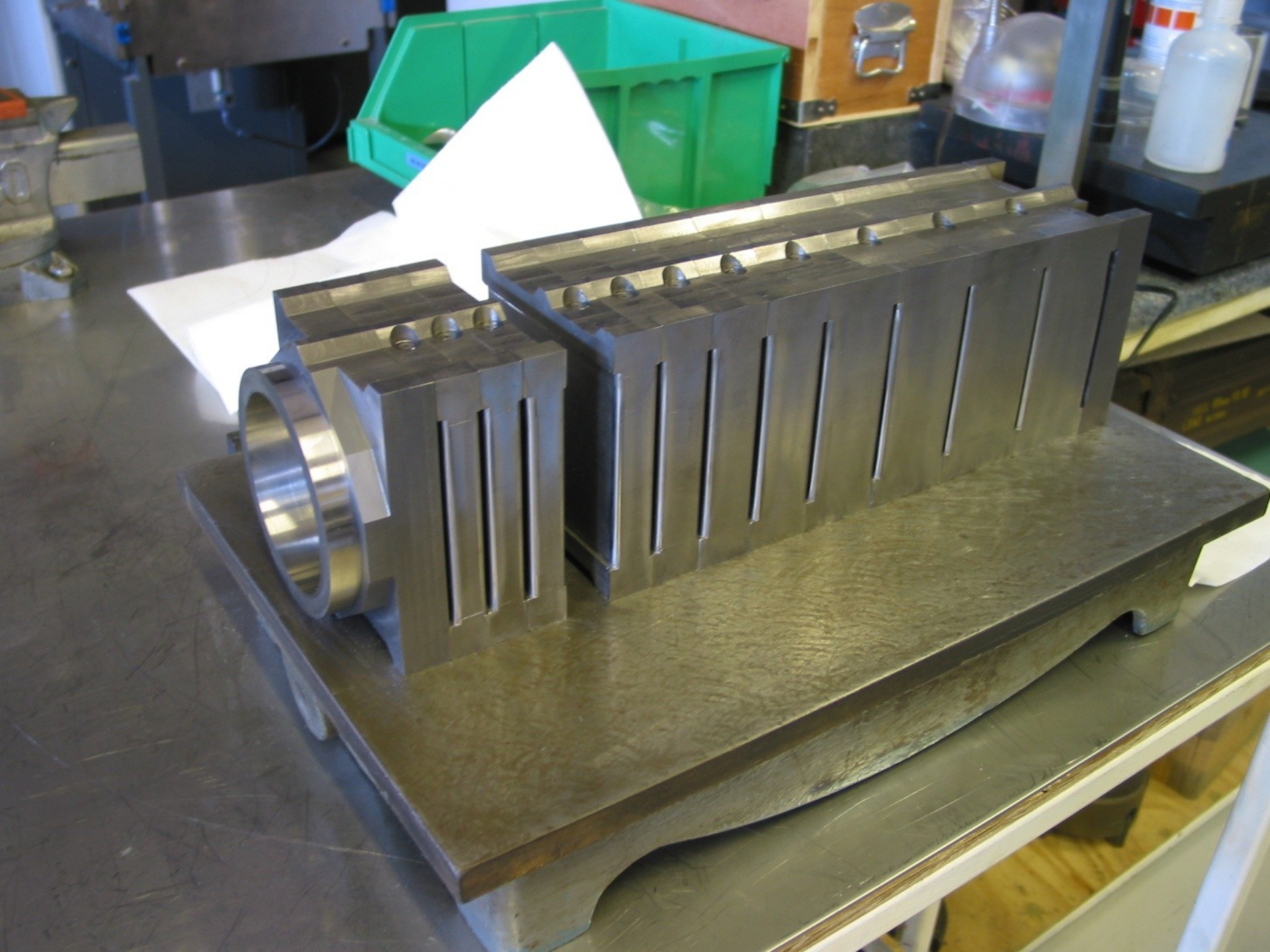
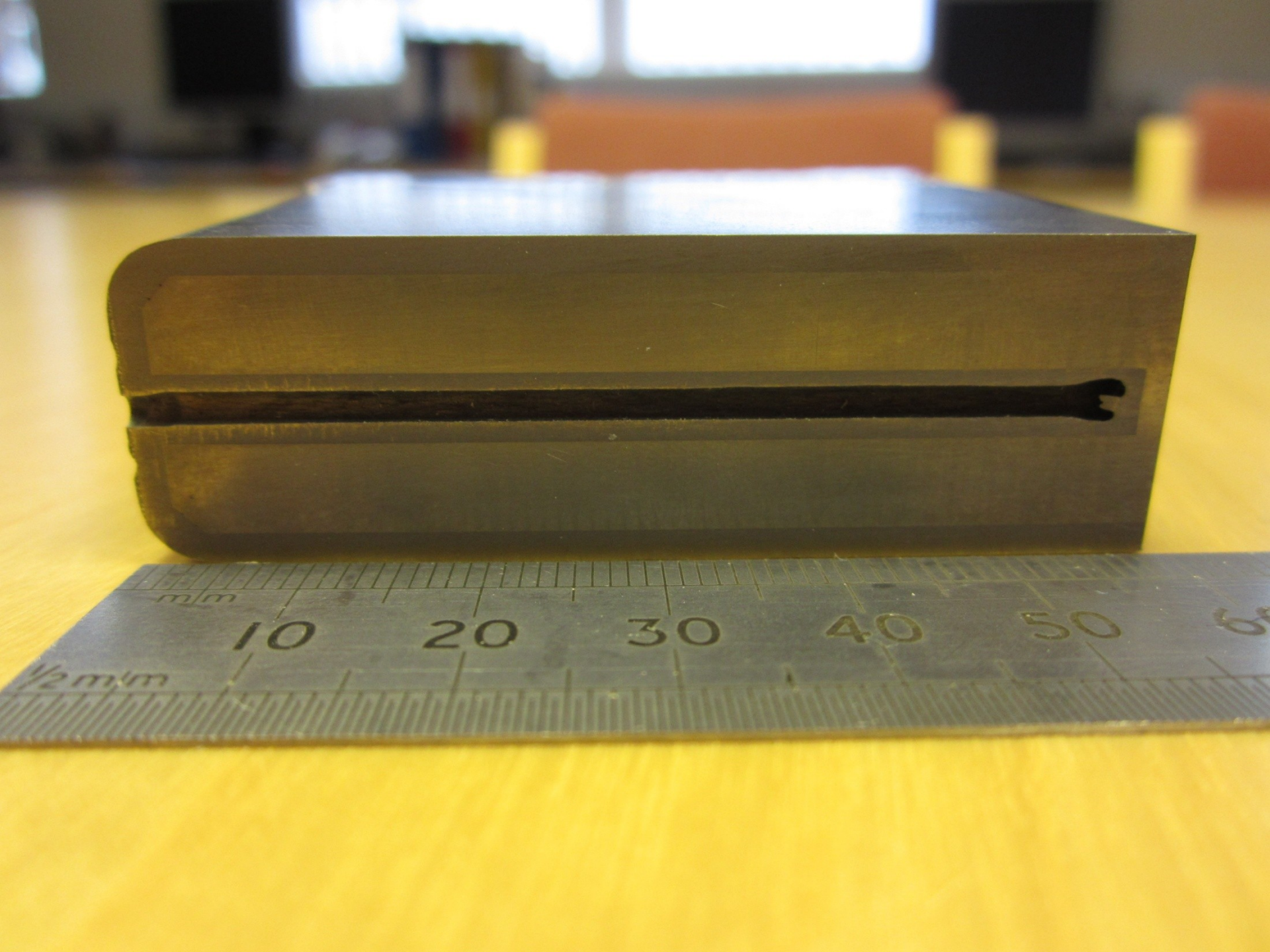
[3] http://pasi.org.uk/Main_Page

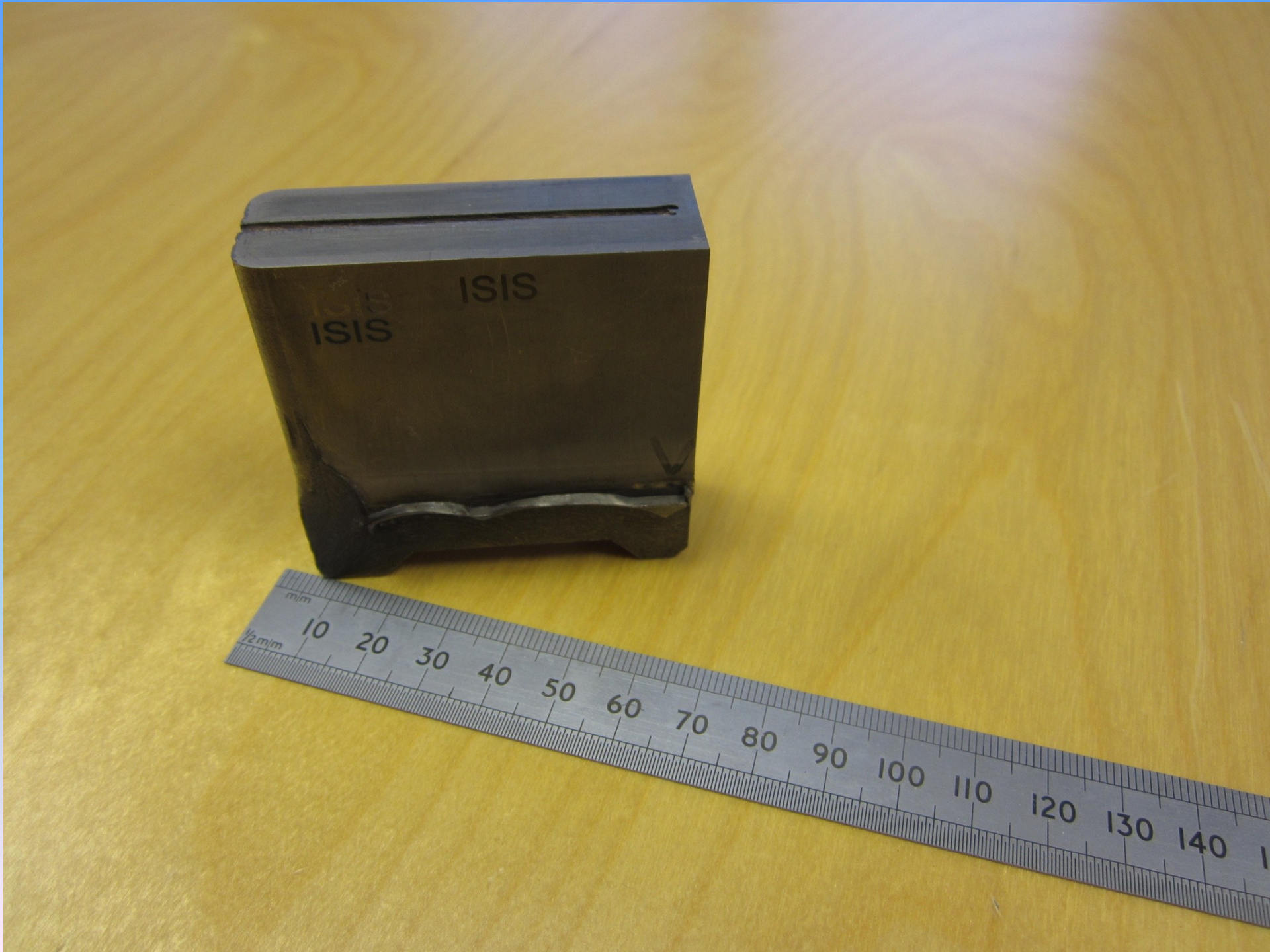
Some of the tungsten targets from the pulsed spallation neutron source, ISIS, at RAL, have received over 12 dpa; this is probably the highest dose received by any sample of tungsten. It is proposed to cut up one of these targets and measure the important mechanical and physical properties of the tungsten. This knowledge will be invaluable in the design of future tungsten targets and in fusion facilities receiving very high proton irradiations.



Section view of ISIS TS1 target




m/m
10
20
30
40
50
½ m/m


ISIS
ISIS
m/m
½ m/m
10
20
30
40
50
60
70
80
90
100
110
120
130
140

The ISIS Department has no suitable remote handling facilities to undertake these measurements. The cost of making the measurements, in-house or elsewhere, is substantial and ISIS has not the funding.

An ISIS tantalum target, with a dose of 12 dpa, was measured[1-3] in a collaboration at the Forschungszentrum, Jülich.

[1] *J. Chen, H. Ullmaier, T. Floßdorf, W. Kühnlein, R. Duwe, F. Carsughi, T. Broome, J. Nucl. Mater. 298 (2001) 248-254.*

[2] *J. Chen, G. S. Bauer, T. Broome, F. Carsughi, Y. Dai, S. A. Maloy, M. Roedig, W. f. Summer, H. Ullmaier, J. Nucl. Mater. 318 (2003) 56-69.*

[3] *H. Ullmaier, ESS 03-131-T, January 2003, Design Properties of Tantalum or Everything you always wanted to know about tantalum but were afraid to ask.*

Inge Uytdenhouwen, who works on **ITA** at the **Belgian Nuclear Research Centre, SCK•CEN, Mol,**
has shown an interest in carrying out the work.

We were going to visit in late January, but unfortunately Inge is in hospital and not expected to be back at work for some time.