

**DEVELOPMENT OF HIGH-Z PLASMA FACING COMPONENTS FOR ITER**

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During the ITER EDA (Engineering Design Activity), the US Home Team developed improved methods for fabricating tungsten-armored plasma facing components. Thermo-mechanical modeling indicated the desirability of using "brush-like" structures (clusters of small filaments or rods) as a means of reducing thermal stresses. The commercial availability of tungsten welding electrode rods (1.6 mm and 3.2 mm diameter) significantly reduced the raw material costs. Three approaches were developed: (1) Cu is plasma sprayed to the W brushes followed by diffusion bonding or e-beam welding the copper backing to the CuCrZr heat sink, (2) Molten Cu is cast directly on the tips of the W brushes followed by the diffusion bonding step, and (3) W rods are sputter-coated with a bonding aid and are directly bonded to the CuCrZr heat sink using HIP or vacuum hot pressing. High heat flux testing was performed up to 18 MW/m<sup>2</sup> without damage to two small-scale divertor mockups.