

## **Benchmarking Multi-scale Models with Microtensile Experiments and Characterization of René 88DT**

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Multi-scale deformation models depend on detailed characterization and experimental benchmarks obtained at salient length scales. Micro-tensile samples of polycrystalline René 88 DT have been extracted from bulk material through the use of femtosecond laser machining techniques. Scale specific micro-tensile experiments are being carried out to support parallel multi-scale modeling efforts. Meso-scale characterization allows for collection of key microstructural features, such as grain size, shape and orientation for a finite number of grains that are tractable in crystal plasticity modeling. Moreover, digital image correlation (DIC) was employed to capture local strain behavior, which can be compared with crystal plasticity predictions. Connecting explicit intergranular microstructures to their attendant mechanical behavior opens a valuable pathway for model development and validation.

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