

# High Temperature Nanoindentation Creep Measurements of Al1100



Nanoindentation creep measurements of Al1100 have been made with the KLA InSEM HT nanoindenter. The InSEM HT allows for independent tip and sample heating to maintain isothermal testing conditions. This application note shows that nanoindentation measurements can yield uniaxial creep properties that are in excellent agreement with traditional creep testing.

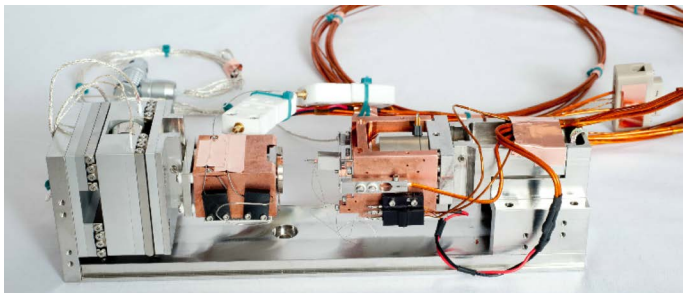


Figure 1. The KLA InSEM HT system integrates into most electron microscope vacuum chambers for in-situ examinations at elevated temperatures.

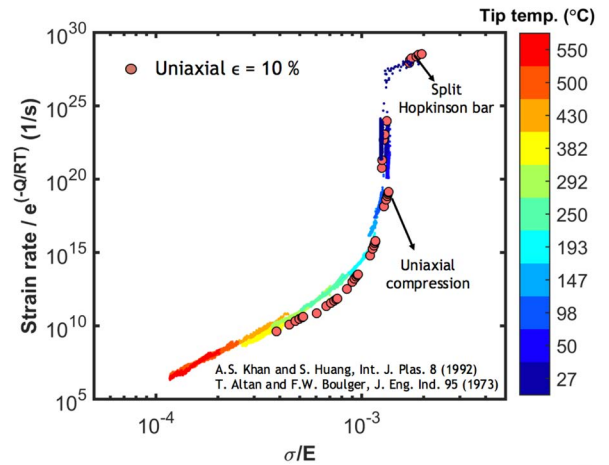


Figure 3. Nanoindentation creep measurements converted to uniaxial results and directly compared to traditional uniaxial test measurements. Excellent agreement was found between the two test testing techniques, noting that nanoindentation results were performed at a fraction of the cost, time, and material required by the uniaxial testing.

The highlights in this application note are taken from a scientific journal article published by Dr. P. Sudharshan Phani and Dr. Warren C. Oliver titled "A direct comparison of high temperature nanoindentation creep and uniaxial creep measurements for commercial purity aluminium", *Acta Materialis* 111 (2016) 31-38.

### References

- Phani, P. Sudharshan and Oliver, Warren C., "A direct comparison of high temperature nanoindentation creep and uniaxial creep measurements for commercial purity aluminum", *Acta Materialis* 111 (2016) 31-38.

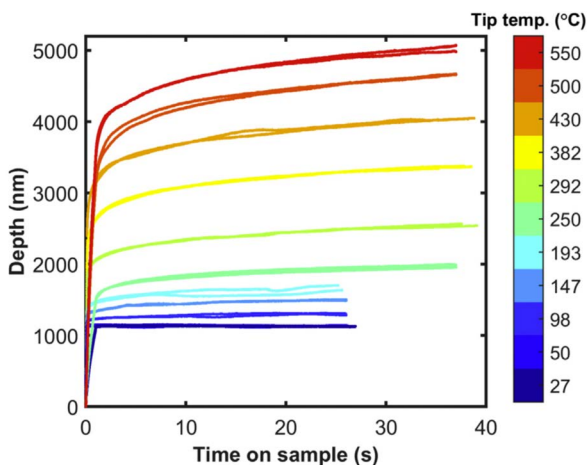


Figure 2. Depth-Time curves measured at different temperatures for a fixed load. Significant creep was observed starting at ~200°C.