Material Strength on Quasi-isentropes JEFFREY H. NGUYEN, J. REED PATTERSON, DANIEL ORLIKOWSKI, L. PETER MARTIN, NEIL C. HOLMES, Lawrence Livermore National Laboratory — We have recently carried out off-Hugoniot dynamic compression experiments on aluminum to gain insight into its yield strength. The samples were initially shocked to a fixed state on the Hugoniot, then quasi-isentropically compressed and released isentropically. We designed the functionally graded density impactor (FGDI) such that the strain rates on compression and release isentropes are nearly equivalent. Here, we will discuss the details of the experiments and error analysis in deriving the yield strength of aluminum on a "hot" quasi-isentrope. We will also discuss recent advances in the FGDI technology that made these experiments possible with significantly reduced uncertainties. Methods to characterize these advances will be discussed. Work performed under the auspices of the U.S. DOE at the University of California/Lawrence Livermore National Laboratory under contract W-7405-ENG-48.

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