Abstract Submitted
for the SHOCK11 Meeting of
The American Physical Society

The Role of Interfaces on Dynamic Damage in Two Phase Metals ELLEN CERRETA, SARYU FENSIN, GEORGE GRAY III, ADAM FARROW, CARL TRUJILLO, MIKE LOPEZ, Los Alamos National Laboratory, MST DIVISION TEAM — For ductile metals, the process of dynamic fracture during shock loading is thought to occur through nucleation of voids, void growth, and then coalescence that leads to material failure. Particularly for high purity metals, it has been observed by numerous investigators that voids appear to heterogeneously nucleate at grain boundaries. However, for materials of engineering significance, those with inclusions, second phase particles, or chemical banding it is less clear what the role of grain boundaries versus other types of interfaces in the metal will be on nucleation of damage. To approach this problem in a step-wise fashion four materials have been investigated: high purity copper, copper with 1% lead, 260 brass, and a leaded 360 brass. These materials have all been shock loaded at 2GPa and soft recovered. In-situ VISAR and post mortem metallography reveals significantly less damage in the metals with no lead. The role of lead at grain boundary triple points and its behavior during shock loading will be discussed.

Ellen Cerreta
Los Alamos National Laboratory

Date submitted: 15 Feb 2011 Electronic form version 1.4