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**Mechanical and Microstructural Investigation of Dual Phase Stainless Steel (LDX2101) under a wide range of strain rates** ALI AMERI, PhD candidate, JUAN ESCOBEDO-DIAZ, MAHMUD ASHRAF, ANDREW BROWN, PAUL HAZELL, WAYNE HUTCHISON , ZAKARIA QUADIR, PhD — The mechanical response and the microstructural evolution of lean duplex stainless steel 2101 (LDSS 2101) under a wide range of strain rates has been investigated. Experimental testing spanned from quasistatic, high strain-rate (Split Hopkinson Pressure Bar) and shock loading. The microstructural changes, e.g. phase transformation and grain rotation, texture and substructure evolution, were investigated by optical microscopy, X-ray diffraction (XRD) and electron-backscattered diffraction (EBSD). A significant increase in the yield stress with increasing strain rate was observed. The plastic deformation, e.g. work hardening rate, was also depended on the strain-rate. The threshold stress for the iron-epsilon phase transformation was obtained from free surface velocity measurements and the retained high pressure phase was assessed by XRD measurements.

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