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In the National Ignition Campaign (NIC) there is a need to probe the two-dimensional structure of a shock front at spatial scales of a few µm and velocity resolution of a few m/s. Current NIC target designs contain the DT fuel inside spherical capsules of either Cu-doped Be, high density C (HDC) or Ge-doped CH. We have fielded a high resolution two-dimensional imaging VISAR (Velocity Interferometer from the Surface of Any Reflector) at the OMEGA laser facility. Over an 800 µm field this instrument captures spatial variations in the velocity across a shock front transmitted through a sample with relative velocity sensitivity $\delta V/V \sim$ few x 10^{-4}, where V is the shock velocity. The instrument is sensitive to mode wavelengths ranging from 2.5 µm to 100 µm. We have observed shock front non-uniformities accumulated on a multi-Mbar shock front after passage through samples of Cu-doped Be, Ge-doped CH and HDC. Results from several batches of Be showed that high quality samples meet the NIC requirements, while samples containing larger void content produce significant levels of non-uniformity. In HDC the shock front showed significant structure for shocks at amplitudes below the threshold for shock melting, while above the melt threshold (near 6 Mbar) the level of non-uniformity diminished significantly after the shock front entered the coexistence region (partial melt). We are continuing experiments on HDC to elucidate details of the shock front structure above and below the melt transition.

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