

Abstract Submitted
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The Measured Temperature and Pressure of EDC37 detonation products JAMES FERGUSON, JAMES RICHLEY, TOM OTA, BEN SUTTON, ED PRICE, AWE — We present the experimentally determined temperature and pressure of the detonation products of EDC37; a HMX based conventional high explosive. These measurements were performed on a series of cylinder tests. The temperature measurements were performed at the end of the cylinder with optical fibres observing the bare explosive through a LiF window. The temperature of the products was measured for 2 microseconds using single colour pyrometry, multicolour pyrometry and spectroscopy with the results from all three methods being consistent. The peak temperature was found to be ≈ 3600 K dropping to ≈ 2400 K at the end of the measurement window. The spectroscopy was time integrated and showed that the emission spectra can be approximated using a grey body curve with no other emission or absorption lines being present. The pressure was obtained using an analytical method which used the velocity of the expanding cylinder wall, measured using heterodyne velocimetry (HetV), and the velocity of detonation, measured with chirped fibre Bragg gratings. The pressure drops from an initial CJ value of ≈ 38 GPa to ≈ 4 GPa at the end of the 2 microsecond temperature measurement window.

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