

CLOSE-IN PRESSURE MEASUREMENTS FROM EXPLOSIVE BULGE TESTS IN A VERTICAL CONFIGURATION

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Abstract:

The response of marine steel plates from different fabrication processes were compared in a series of experiments by using explosive loads in close proximity. An experimental configuration known as the explosive bulge test was modified, from the standard geometry where the plate is placed in the horizontal plane, to a geometry utilising the vertical plane. This enabled the novel use of high speed photography to track the detonation process including the emanating complex shock pattern, and permitted the deployment of pressure transducers on the ground to monitor the shock fronts. Finite element simulations using LSDYNA are also presented to aid in the interpretation of the detonation sequence and the shock evolution. The resolution, from the high speed video, of the shock front ahead of the fireball enabled the analysis of the pressure measurements and simulations. The photographic correlation enabled testing the validity of the pressure measurements and evaluated the applicability and limitations of the FE simulations for explosive close-in air blast proximity studies.