

INTERNAL PRESSURE MEASUREMENTS FROM EXPLOSIVELY LOADED CUBICLES

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A series of experiments were conducted to measure the explosive pressure-time histories on the interior of 1 m³ cubicles which are used for modeling structural damage from explosive loading. In this experimental configuration each cubicle, consisting of mild steel walls 5 mm thick, was explosively loaded by a centrally positioned pentolite sphere. In such studies it is imperative to obtain reliable measurements of the pressure-time histories. The pressure transducers were subjected to high pressures from the explosive detonation products, as well as thermal flash, convection and high acceleration. The instrumentation used required sufficient bandwidth to record the transient pressure pulses with minimal or no effects from the other explosive side products. Interpretation of the material's failure mechanisms can be completely erroneous if these issues are not clearly delineated. Therefore, further post experimental investigations were undertaken to validate the data and the investigations included repeating measurements from previous tests on identical cubicles. It was the purpose of these investigations to determine the consequences of the unwanted effects on the data. Both piezoelectric and piezoresistive pressure transducers were used and the relative merits of each is discussed for this application.