

# **A Test Apparatus for Measuring Airblast Pressures From Cased Charges**

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Airblast measurements from bare explosive charges in simple burst configurations are plentiful, and the physics involved are generally well-understood. The same cannot be said of cased charges however, for a variety of reasons. The principal problem has involved the tendency of the fragments associated with the cased charge to damage the blast pressure instruments before meaningful airblast measurements have been obtained. As a result, the airblast fields generated by cased charges are not characterized well. Coarse assumptions are typically applied in predictive methods to represent the cased charge as an equivalent bare sphere of reduced mass. The large uncertainties associated with engineering level simulations of cased charges complicates the efforts of defense organizations to evaluate munitions effectiveness and properly assess collateral effects.

A special test apparatus, called an "instrumented blastpad" has been designed and constructed by the Air Force Research Laboratory, Munitions Directorate, that permits direct measurement of side-on airblast pressures from subscale cased explosive charges. The instrumented blastpad is a large (42.7-m x 24.4-m) concrete surface that is 20.3-cm thick and contains an array of 70 instrumentation mounts oriented flush with the surface of the concrete slab so that they are protected from fragment impacts. The instrumentation mounts are positioned at a variety of ranges in a 180° semi-circle that is centered on a replaceable detonation area. Charges are suspended in this area in a manner that closely matches a classic, simple burst configuration while still allowing the case to expand and fragment naturally. This paper describes the instrumented blastpad and shows results from experiments involving generic cased explosive cylinders.

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