MEASURED AIRBLAST ENVIRONMENT FROM AN EXPLOSIVE CHARGE HAVING A SCORED METAL CASING

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For most applications, the introduction of a metallic casing tends to reduce the intensity of the airblast from the cased charge. Most predictive methods assume that the inertial resistance of the casing is the dominant parameter in estimating the reductions in peak airblast pressure and impulse. This enables the use of simple formulae to estimate bare charge equivalents for cased charges which consider only the relative masses of explosive and casing material. Recent experiments have shown that casing material properties can significantly influence the resulting airblast field from a cased explosive charge, suggesting that in certain cases, other parameters besides the relative masses of casing material and explosive might be required.

To further pursue these findings, a special cased explosive charge was designed and tested on the AFRL blastpad. This casing was "scored" with a carefully designed pattern of grooves. Within a scored groove, the casing thickness was the same as lightly-cased charges tested previously on the blastpad. Between the grooves, the casing thickness was very nearly the same as medium-cased charges tested previously on the blastpad. Overall ratios of casing mass to explosive mass were the same as the medium-cased charge. The measured airblast field from the charge with the scored casing was then compared to those from previous blastpad tests. Given this scheme of experimentation, agreement of the airblast field from the scored-cased charge with that of the medium-cased charges would imply that the inertial resistance of the casing was the dominant parameter influencing the airblast field. Conversely, better agreement with the airblast fields from the lightly-cased charges would imply that characteristics of casing fracture were dominant. In this paper, the experiment with the scored-cased charge is described, and airblast fields compared to gain proper insight into the underlying physical behaviors affecting airblast production from cased charges.