

HEIGHT OF BURST RESULTS FROM SMALL SCALE EXPLOSIONS

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Results will be presented of the side on overpressure as well as of the impulse as a function of ground rage and HOB. Analytical predictions will be discussed.

On a test site charges of 0.016 kg, 0.128 kg and 1.024 kg of an explosive were fired in heights fringing from 0.5 m to 6 m. Pressure histories were measured with the aid of gauges mounted on a plate in distances of 0.5 m and 1 m one after another. Nearly ideal reflection conditions were supposed to occur. Sachs Scaling Law was applied to reduce the data on the basis of a 1 kg charge and of sea-level values. The joint work of the authors yielded further data coming from corresponding tests with charges of 100 kg and 500 kg, however.

The results were compared with those found in the literature (e.g. the effects of nuclear weapons) which appear to be based on calculations using the van Neumann 2-shock theory. This theory predicts an increase of the reflected overpressure in the region close to transition from regular to Mach reflection. This increase has been observed in shock tube experiments using plane shocks reflecting from plane wedges, but has not been found in experiments in which a plane shock reflects from a convex cylindrical surface. The rise in reflected overpressure close to transition produces a knee in the HOB isobars, leading to a prediction of an extended region in which the peak overpressure does not decay significantly. The HOB curves based on the small experiments do not show such a knee in the isobars.