

DETONATING FUSE IN THE FORTF SHOCK TUBE III TO OBTAIN AIR SHOCK WAVES WITH LOW AMPLITUDE AND LONG DURATION

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The FortF shocktube III is mainly used to simulate shock waves from nuclear explosions. In the megapascal range the test objects are mounted close to an explosion chamber where HE charges up to 100 kg can be detonated. The duration of the gas pressure is regulated by an opening connected to a smooth rock tunnel, 2.1 x 2.1 meters wide and 220 meters length.

This tunnel has lately been used to create shock waves in the kilopascal range by detonating distributed charges made of cordtex. The reason for this is that the method above does not work properly for low pressures, the reflections in the chamber cause pressure peaks that dominate over a low gas pressure. Concentrated charges in the tunnel on the other hand give too short duration and may cause damage to the tunnel walls.

The cordtex filaments were arranged in different geometries, their lengths varying between 10 and 165 meters. 2 types of cordtex were tested and some tests were repeated in order to study the spread in results. About 50 tests were made in total. The side-on pressure was measured along the tunnel and the reflection at the tunnel end as well. After evaluation of the results some simple relations between the charge and the properties of the shock wave are suggested.

The studied pressure levels are between 1 and 100 kilopascal and the overpressure phase up to 0.5 seconds.