

# REPEATIBILITY OF SMALL CHARGE DETONATION IN PIPES

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Repeatability of blast charges in experimental investigations is definitely a key issue to properly define the behaviour of structures subjected to explosions. In fact, due to the unsteadiness of the process and the destructive nature of tests involving blast waves, the experimental approach presents large difficulties concerning the degree of randomness of explosions.

Thus, in order to estimate the repeatability of the overpressure acting on the internal surface of pipes, a series of blasting tests were carried out on a steel pipe 1 m long, 10 mm thick and with a 600 mm diameter.

In the experimental investigation here presented small cylindrical charges of the gram-order of a solid explosive were investigated (3g, 6g, 12g and 24g), and 12 tests have been performed for each quantity, maintaining the tube in the elastic regime.

The single cylindrical explosive charge, made of ERGODYN35E, was inserted in a card cylinder and confined by two pieces of plasters placed ahead and beyond the explosive within the cylinder. The detonator is inserted in the card cylinder and put in the contact with the explosive, in the centre of its flat face. The explosive source so packaged was placed in the central section of the pipe and suspended in the centre of the section by means of three thin plastic wires.

The steel tube was opportunely instrumented with 20 different strain-gauges and 7 pressure transducers, placed in 3 different sections along the tube (one in correspondence of the central section where the explosion occurs, and the other 2 symmetrically located around it at a distance of 12.5 cm). Longitudinal and hoop strains of the tube and the incident and reflected pressure histories during the blast phenomena were recorded.