

SHOCK TUBE VERIFICATION OF THE FACTORY CALIBRATION OF PENCIL PROBES

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ABSTRACT

Obtaining reliable side-on pressure values from shock waves in air requires copious amounts of preparation, particularly for mounting and aligning the sensors. However, scrupulous attention to detail will be to no avail if the sensors used are not properly calibrated or suffer from an inherent error.

Until recently most laboratories had to rely on a single manufacturer of blast pencil probes either as sole supplier or as provider of reference sensors. Towards the end of 2015, a competitor launched its own pencil probes, offering an alternative. Laboratories are now facing the question, whether the two products deliver comparable results. Considering the fact that the two manufacturers apply inherently different methods to calibrate their sensors, this issue gets even more pressing.

To resolve this problem, five pencil probes of each manufacturer were tested in a shock tube at different peak pressure levels. For each shot sensors of both manufacturers were mirror-symmetrically placed inside the shock tube and two pressure gauges for interior ballistics (placed in the mirror plane) were used as reference. The signals obtained from the sensors were then used to determine the consistency of each product and the deviation of the individual signals from the reference.