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Measurements of impact force in a Gas Gun equipment

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Dynamic experiments within the strain rate range of approximately 10^4 s^{-1} are mostly performed using the Taylor test, where material specimens, launched by a gas gun, impact a rigid surface and provide information about the mechanical response of the tested material through their initial speed and deformed shape after impact. Fast video recordings and force measurements might make it possible to derive more information about the entire flow curve from a single test. In this study, the impact chamber of a gas gun is equipped with fast-response piezoelectric load cells to attempt to measure the impact force of the specimen on the rigid plate of the Taylor test, accounting for the dynamic response of the whole impactor-plate-load cells system. Fast imaging is also used to provide measurements of the specimen flight speed before impact and of the specimen deformation during impact.

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