

Quasi-static studies of deformation, fracture and mechanical properties of a PBX simulant using digital image correlation method

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Summary

The macroscopic deformation and fracture behavior of a polymer bonded explosive (PBX) simulation material were studied by using Digital Image Correlation (DIC) method. The Brazilian test, semi-circular bending test, punch loading and uniaxial loading experiments were chosen for the study. The whole displacement and strain fields were obtained by using DIC method at macro-scale. New sights into fracture processes and failure mechanisms of simulant samples under different quasi-static loading conditions have been obtained. Macro studies show that the experimental results are in agreement with the theoretical analysis. The experimental methods combined with DIC technique have broad applicability to deformation and fracture studies of a variety of composites.

