

BEHAVIOR FORMS OF GLASS AND OTHER TRANSPARENT MATERIAL TARGETS UNDER HIGH SPEED IMPACT LOADING

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ABSTRACT

The failure forms associated to high speed loading tests on Glass, Polymethylmethacrylate and Polycarbonate targets are presented. Targets of the three indicated transparent materials were subjected to high velocity impact, at normal incidence, by spherical steel projectiles in the 100 m/s to 950 m/s velocity range. Each type of the targets studied showed its unique trend in its failure forms. The failure forms observed seems to be related to the mechanical properties of the tested material. Polycarbonate targets showed failure forms quite similar to those shown by ductile metallic targets of similar thickness. However, the glass and the polymethylmethacrylate targets showed totally different forms. Based on the high velocity impact test results, a mathematical model that couples the terms of the work done in causing the failure forms to the projectile kinetic energy dropped during the target perforation is suggested.

Keywords; *Glass performance, Transparent materials, Performance of materials under impact conditions*