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BALLISTIC RESISTANCE OF POLYCARBONATE/POLYURETHANE COMPOSITE ARMOR PLATE SUBJECTED TO SINGLE AND MULTIPLE IMPACTS

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Ballistic impact behavior of polycarbonate (PC)/Polyurethane (PU) composites used in lightweight transparent armor plate were studied. The PC/PU multi-layered plates of various thicknesses were impacted by the projectiles in the velocity range of 1350 – 1450 ft/sec (411 – 442 m/sec). Localized failure is observed at the point of impact while a greater area of the armor plate is still intact and the debris from the incoming treat is contained within the multi-layered structure. Dent dimension in the plate supporter after single and multiple high velocity impacts were measured and the effect of the position of polycarbonate layers in the PC/PU composites on the damage extent of the armor plates is investigated. The results show the increasing trend in dent dimension versus overall reduction of the plate thickness. Multiple impacts in the 2x2 inches area presented can be significantly helpful in designing polycarbonate armor plates to enhance safety.