عنوان مقاله:

A study of skins' layer sequence influence on high velocityresponse of sandwich panels with FMLs skins

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خلاصه مقاله:

This work investigates influence of skins' layer sequence on the high velocity impact response of sandwich specimens with FMLs skins and polyurethane foam by experimental and numerical methods. Specimens were fabricated using hand lay-up method followed by pressurizing them during the curing process. Aluminum layers were made based on (p2) etches method to make stronger bonding between metal and glass/epoxy layers. Impact tests were carried out using a Helium gas gun to validate results of finite element model. The 3D finite element code, LS-DYNA, was employed to simulate high velocity impact of cylindrical projectile with clamped boundary condition for targets. The modelgeometry was created by the pre-processor ETA Femb and LS- PREPOST. 8-node reduced integration solid element was used to mesh the model for decreasing computational cost. For aluminum layers, strain rate effects were predicted by Cowper-Symonds constitutive relationship. To include strain effects of glassepoxy layers, tuned mechanical properties was employed in the numerical model. Comparison of different layer sequences of skins indicated that these panels have benefits of both composite sandwiches and metal sandwiches, simultaneously. In addition, effects of different layer sequences of skins were studied on transverse deflection of skins

کلمات کلیدی:

Fiber metal laminate (FML); Sandwich panel; High velocity impact; LS-DYNA; Polyurethane foam; Energy absorption

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