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IMPACT BEHAVIOUR AND RESIDUAL STRENGTH OF HONEYCOMB STRUCTURES

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Rezumat. *Scopul acestui articol este studiul comportării în timpul impactului și după acesta a unei structuri stratificate cu miez de tip fagure. Pentru aceasta a fost creat și apoi aplicat un program de testare. Acesta constă în solicitarea la impact cu energii multiple a stratificatului, urmând ca, după aceea, epruvetele impactate să fie supuse la un test de compresiune pentru a determina capacitatea portantă după impact. Rezultatele obținute sunt centralizate la finalul lucrării într-un grafic care evidenţiază capacitatea portantă a stratificatului în funcție de energia de impact.*

Abstract. *The goal of this article is to study the behavior of sandwich structures with honeycomb core during and after an impact. In this purpose, a test program was created and afterwards was applied. It consists in the application of multiple impact energies over the multi-layered structure. Impacted specimens are subjected to a compression test in order to determine the load capacity after impact. The results are summarized at the end of the paper in a graph that shows the loading capacity of multi-layer structure depending on the impact energy.*

Keywords: multi-layer structure, honeycomb, impact, residual stress and residual strength

1. Introduction

Impact resistance is one of the most important properties for component designers to consider, as well as the most difficult to quantify. Impact resistance is a critical measure of service life and more importantly these days, it involves a complicated problem of product safety and liability.

Impact software and data acquisition system allows the engineer to "see" all types of information that was previously unknown, including incipient damage points and ductile-brittle transition zones. With instrumentation, the load on the specimen is continuously recorded as a function of time and/or specimen deflection prior to fracture. This gives a more complete representation of an impact than a single calculated value because failures originate at the weakest point and propagate from there. Samples don't have to shatter to be considered failures. Failure can be defined by deformation, crack initiation, or complete fracture, depending on the requirements [1] and [5].

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