

Root causes analysis of disbonds and unidentifiable ultrasonic indications on composite materials

Abstract

To ensure the structural integrity of composite materials, honeycomb sandwich panels must be inspected for defects with through-transmission ultrasonic testing. This study focused on the root causes analysis of disbonds and unidentifiable ultrasonic indications on composite materials. Disbonds is a condition that lack of adhesion between ply and core. Unidentifiable ultrasonic indications define as an unknown defect which can only identified after remove the peel ply. In this study, Minitab 16 and SPSS 16 are used in analyzing the potential causes that influences the disbonds and unidentifiable ultrasonic indications. The root causes of disbonds are core crush and core crack. Core crush and core crack may caused by high localized loads or high compaction pressure. For unidentifiable ultrasonic indications, the root cause is adhesive flood at core. Imperfect compaction pressure leads to the uneven flow of adhesive. For the area have lower pressure, probability for adhesive to accumulate is higher. Pleated or dog ear method can be implemented in bagging process to ensure better compaction mechanism. Operators must be trained and educated for better performance.

Keywords; Composite Material, Disbonds, Root Cause Analysis of Disbonds, Unidentifiable Ultrasonic Indications