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Title Experimental Characterisation of **GL**ass **AL**uminum **RE**inforced (**GLARE™**) laminates

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Abstract

Fibre metal laminates such as GLARE™ have found promising application in the aerospace industry. These laminates were developed at the structures and materials laboratory of Delft University of Technology, Netherlands. GLARE™ is a material belonging to the family of Fibre Metal Laminates consisting of thin aluminum layers bonded with unidirectional S2-Glass fibres with an adhesive. Aluminum and S2-Glass when combined as a hybrid material can provide best features of the both metals and composites. These materials have excellent fatigue, impact and damage tolerance characteristics and a lower density compared to aluminum. GLARE™ has found major application in front and aft upper fuselage, leading edges of empennages of advanced civil aircrafts like A380. This document looks into the evaluation of two configuration of GLARE™ for its mechanical and impact characteristics. The mechanical characterisation was carried out for tensile, compression, Flexure, ILSS, Open Hole Tension, Open Hole Compression and Shear (Iosipescu). The impact behaviour were characterised based on a low velocity drop weight impact carried on these laminates. The study shows that the basic properties evaluated were more dictated by the property of the S2-Glass used. The studies show that GLARE™ laminates posses' high impact damage resistance compared to other composite material. All the test datas generated for this study will be brought out in this document.