

Accepted Manuscript

Mechanical behavior of novel GFRP foam sandwich adhesive joints

Bo Cen, Yang Liu, Zhuo Zeng, Jian Wang, Xiaofeng Lu, Xiaolei Zhu

PII: S1359-8368(16)32274-0

DOI: [10.1016/j.compositesb.2017.07.034](https://doi.org/10.1016/j.compositesb.2017.07.034)

Reference: JCOMB 5170

To appear in: *Composites Part B*

Received Date: 12 October 2016

Revised Date: 28 May 2017

Accepted Date: 28 July 2017

Please cite this article as: Cen B, Liu Y, Zeng Z, Wang J, Lu X, Zhu X, Mechanical behavior of novel GFRP foam sandwich adhesive joints, *Composites Part B* (2017), doi: 10.1016/j.compositesb.2017.07.034.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Mechanical behavior of novel GFRP foam sandwich adhesive joints

Bo Cen, Yang Liu, Zhuo Zeng, Jian Wang, Xiaofeng Lu*, Xiaolei Zhu*

*(School of Mechanical and Power Engineering, Nanjing Tech University, Nanjing, China, 211816;)***Abstract:**

Composite foam sandwich is a new, energy-absorbing and load-bearing type of structure, which is widely used in engineering. Furthermore, utilization of connection between composite foam sandwich panels is essential. In this paper, an adhesive joint between two GFRP foam sandwich panels is proposed (model A) and several main failure modes of the novel adhesive joint structure are investigated through four-point bending test. Based on 3D-Hashin failure criterion, cohesive behavior failure criterion and brittle cracking failure criterion of novel GFRP foam sandwich adhesive joints, a progressive damaged model is established to simulate the strength and the results of FEM model and experiments are in good agreements. In order to analyze the effects of stiffness and strength on the structure's mechanical properties, three more connection were proposed to compare the simulation results, which established a simple engineering design for joint structure.

Keywords: Composite sandwich; Joints; Mechanical properties; Bending

***Corresponding author:**

Xiaofeng Lu, School of Mechanical and Power Engineering, Nanjing Tech University, China;

Xiaolei Zhu, School of Mechanical and Power Engineering, Nanjing Tech University, China;

E-mail: xflu@njtech.edu.cn (Xiaofeng Lu);

zhuxiaolei@njtech.edu.cn (Xiaolei Zhu);

1. Introduction

Composite sandwich structures are widely used in many fields, such as aerospace structures, ships, cars, loads, harbors, trains, and wind turbines, because of their light weight, outstanding mechanical properties, and corrosion resistance. However, the joint connection sections are the weakest part in composite sandwich structures. An efficient mechanical connection between two

Download English Version:

<https://daneshyari.com/en/article/5021101>

Download Persian Version:

<https://daneshyari.com/article/5021101>

[Daneshyari.com](https://daneshyari.com)