

Accepted Manuscript

Heat-resistant sandwich structure with carbon fiber-polyimide composite faces and a carbon foam core

Toshio Ogasawara, Shingo Ayabe, Yuichi Ishida, Takuya Aoki, Yuki Kubota

PII: S1359-835X(18)30345-2
DOI: <https://doi.org/10.1016/j.compositesa.2018.08.030>
Reference: JCOMA 5164

To appear in: *Composites: Part A*

Received Date: 19 February 2018
Revised Date: 11 August 2018
Accepted Date: 23 August 2018

Please cite this article as: Ogasawara, T., Ayabe, S., Ishida, Y., Aoki, T., Kubota, Y., Heat-resistant sandwich structure with carbon fiber-polyimide composite faces and a carbon foam core, *Composites: Part A* (2018), doi: <https://doi.org/10.1016/j.compositesa.2018.08.030>

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.



Title

Heat-resistant sandwich structure with carbon fiber-polyimide composite faces and a carbon foam core

Authors

Toshio Ogasawara ^{1*)}, Shingo Ayabe ²⁾, Yuichi Ishida ³⁾, Takuya Aoki ³⁾, and Yuki Kubota ³⁾

(*Corresponding author, ogasat@cc.tuat.ac.jp)

Affiliations

- 1) Tokyo University of Agriculture and Technology, Tokyo, Japan
- 2) Tokyo University of Science, Tokyo, Japan (former graduate student)
- 3) Japan Aerospace Exploration Agency (JAXA), Tokyo, Japan

Key Words: Sandwich structures, Foams, Thermal properties, Mechanical properties

Abstract

This paper presents the processing and properties of a new heat-resistant sandwich structure, which consist of carbon fiber-polyimide composite face sheets and a carbon foam core. A novel phenylethynyl-terminated imide oligomer (TriA-X) was applied for both matrix resin and film adhesive. Mechanical properties of the sandwich structures were evaluated using flat-wise tension tests, and three-point bending tests. Bending strength of the sandwich panel was almost constant up to 250 °C. The bending rigidity of the sandwich panels showed good agreement with the numerical result by considering the temperature-dependent elastic modulus of CFRP and carbon foam. Thermal insulating properties of the sandwich structures were evaluated using infrared lamp heating tests in a vacuum chamber, resulting in good thermal insulating property. Heat transfer analysis of the sandwich structures was conducted using finite element method. Comparison with heating test results, the validity of the heat transfer analysis model was successfully demonstrated.

Download English Version:

<https://daneshyari.com/en/article/10128367>

Download Persian Version:

<https://daneshyari.com/article/10128367>

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