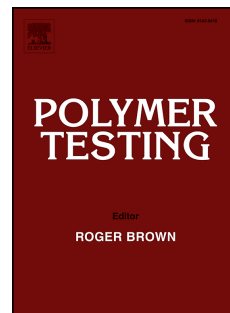


# Accepted Manuscript

Effect of crumb rubber on mechanical properties of multi-phase syntactic foams

Thong M. Pham, Jim Kingston, Gary Strickland, Wensu Chen, Hong Hao



PII: S0142-9418(17)31374-0

DOI: [10.1016/j.polymertesting.2017.12.033](https://doi.org/10.1016/j.polymertesting.2017.12.033)

Reference: POTE 5285

To appear in: *Polymer Testing*

Received Date: 24 September 2017

Revised Date: 6 November 2017

Accepted Date: 30 December 2017

Please cite this article as: T.M. Pham, J. Kingston, G. Strickland, W. Chen, H. Hao, Effect of crumb rubber on mechanical properties of multi-phase syntactic foams, *Polymer Testing* (2018), doi: 10.1016/j.polymertesting.2017.12.033.

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.

# 1 Effect of Crumb Rubber on Mechanical Properties of Multi-phase 2 Syntactic Foams

3 Thong M. Pham<sup>1</sup>, Jim Kingston<sup>2</sup>, Gary Strickland<sup>2</sup>, Wensu Chen<sup>1</sup> and Hong Hao<sup>1\*</sup>

4 <sup>1</sup>Center for Infrastructural Monitoring and Protection, School of Civil and Mechanical  
5 Engineering, Curtin University, Kent Street, Bentley, WA 6102, Australia

6 <sup>2</sup>Matrix Composites & Engineering, 150 Quill Way, Henderson, WA 6166, Australia

7 \*Corresponding author's email: hong.hao@curtin.edu.au

## 8 Abstract

9 Syntactic foam is a lightweight and strong material which can be used in marine and  
10 aeronautical applications. However, the brittleness of the material limits its application to a  
11 broader range. Adding crumb rubber to the syntactic foam can increase its energy absorption  
12 capacity. The effect of crumb rubber on the fracture toughness and energy absorption capacity  
13 of 2-phase and 3-phase syntactic foam is evaluated under both static and impact loads. The  
14 experimental results have shown that the fracture toughness of the 2-phase rubberized  
15 syntactic foam increased by 8% while an increase of 22% of its fracture energy was observed.  
16 Under quasi-static loads, the 3-phase rubberized syntactic foam showed decreases in the  
17 compressive strength and elastic modulus but an increase in the energy absorption capacity as  
18 compared to the syntactic foam without crumb rubber. In addition, the impact energy  
19 absorption of the 3-phase rubberized syntactic foam increased by 24% as compared to that of  
20 the 3-phase syntactic foam without crumb rubber.

21 **Keywords:** Syntactic foam; Impact behaviour, Energy absorption; Fracture toughness; Crumb  
22 rubber.

Download English Version:

<https://daneshyari.com/en/article/7825128>

Download Persian Version:

<https://daneshyari.com/article/7825128>

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