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Page 1 (Records 1 -- 1)

Print

[1]

Record 1 of 1

Title: Determination of Flexural Properties of Rigid PUR Foams Using Digital Image Correlation

Author(s): Voiconi, T (Voiconi, Tudor); Linul, E (Linul, Emanoil); Marsavina, L (Marsavina, Liviu); Sadowski, T (Sadowski, Tomasz); Knec, M (Knec, Marcin)

Edited by: Nicoara M; Opris C

Source: ADVANCED MATERIALS AND STRUCTURES V **Book Series:** Solid State Phenomena **Volume:** 216 **Pages:** 116-121 **DOI:** 10.4028/www.scientific.net/SSP.216.116 **Published:** 2014

Times Cited in Web of Science Core Collection: 4

Total Times Cited: 4

Usage Count (Last 180 days): 0

Usage Count (Since 2013): 6

Cited Reference Count: 10

Abstract: Cellular materials represent a new class of materials; main parameters that characterize the cellular structure are relative density, shape of the cell (open or closed), wall thickness and cell diameter. The purpose of this paper is to investigate the microstructure of foams materials and also to determine the flexural properties of this rigid PUR foams using Digital Image Correlation (DIC). The rigid PUR foams cells morphology and pore distribution for three densities (100, 145 and 300 kg/m(3)) were studied before testing through scanning electron microscopy. Determination of flexural properties was carried out on rectangular beam samples using ARAMIS 2D system. This method provides a substantial increase in accuracy for measuring strain and is based on the calculation of surface deformation using a set of digital images from undeformed stage to different deformed stages. The specimens were subjected to static three points bending tests with loading rate of 2 mm/min, at room temperature and loading was applied in rise direction of the foam. Experimental results show that main mechanical properties such as flexural modulus and flexural strength values increases with increasing of density.

Accession Number: WOS:000347924100020

Language: English

Document Type: Proceedings Paper

Conference Title: 5th International Conference on Advanced Materials and Structures (AMS)

Conference Date: OCT 24-25, 2013

Conference Location: Timisoara, ROMANIA

Conference Sponsors: Politechnica Fdn

Author Keywords: closed - cell PUR foam; flexural modulus/strength; 3PB tests; DIC and SEM images

KeyWords Plus: POLYURETHANE; BEHAVIOR; PERFORMANCE; BEAMS

Addresses: [Voiconi, Tudor; Linul, Emanoil; Marsavina, Liviu] Politehn Univ Timisoara, Dept Mech & Strength Mat, 1 Mihai Viteazu Ave, Timisoara 300222, Romania. [Sadowski, Tomasz; Knec, Marcin] Lublin Univ Technol, Civil Engn Lab, Lublin, Poland.

Reprint Address: Linul, E (reprint author), Politehn Univ Timisoara, Dept Mech & Strength Mat, 1 Mihai Viteazu Ave, Timisoara 300222, Romania.

E-mail Addresses: tudor_2015@yahoo.com; linul_emanoil@yahoo.com; lmarsavina@yahoo.com; t.sadowski@gmail.com; m.knec@pollub.pl

Author Identifiers:

Author	ResearcherID Number	ORCID Number
Knec, Marcin	N-7991-2015	0000-0002-1974-7345
Sadowski, Tomasz	F-1808-2010	0000-0001-9212-8340
LINUL, Emanoil		0000-0001-9090-8917

Publisher: TRANS TECH PUBLICATIONS LTD

Publisher Address: KREUZSTRASSE 10, 8635 DURNTEN-ZURICH, SWITZERLAND

Web of Science Categories: Materials Science, Multidisciplinary

Research Areas: Materials Science

IDS Number: BB9AE

ISSN: 1012-0394

ISBN: 978-3-03835-212-9

29-char Source Abbrev.: SOLID STATE PHENOMEN

Source Item Page Count: 6

Funding:

Funding Agency	Grant Number
Romanian National Authority for Scientific Research, CNCS - UEFISCDI National Grant	PN - II - ID - PCE - 2011 - 3 - 0456 172/2011
FP7-REGPOT	245479
Polish Ministry of Science and Higher Education	1471-1/7.
Lublin University of Technology, Poland	PR UE/2010/7

This work was supported by the Romanian National Authority for Scientific Research, CNCS - UEFISCDI National Grant PN - II - ID - PCE - 2011 - 3 - 0456, contract number 172/2011. The experiments were performed in the facilities of the Center of Excellence for Modern Composites Applied in Aerospace and Surface Transport Infrastructure (European Union Seventh Framework Programme (FP7/2007 - 2013) supported by FP7-REGPOT-2009-1, under grant agreement No: 245479 and Polish Ministry of Science and Higher Education - Grant No 1471-1/7. PR UE/2010/7) from Lublin University of Technology, Poland.

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Page 1 (Records 1 -- 1)

Print

[1]