EUROMECH Final Report

EUROPEAN MECHANICS SOCIETY

Please send this report in electronic form to the Secretary General of EUROMECH, within one month after the Colloquium.

EUROMECH Colloquium No: 459

Title: *Mechanical Behaviour of cellular solids*

Dates and location: 7-10 June, 2004 in Nancy, France

Chairperson: Pr. Jean-François Ganghoffer. LEMTA – ENSEM. Nancy, France

Co-Chairperson: Dr. Patrick Onck. University of Groningen, The Netherlands.

Is there need of another Colloquium on the same or a related subject? No (not to our knowledge)

Full registration fee: 232 euro

What other funding was obtained? Subventions from Universities (1600 euro), Regional Council of Lorraine (765 euro) and EUROMECH (1200 euro)

What were the participants offered? Conference Proceedings + Refreshment breaks + cocktail + excursion + banquet.

Number of members of EUROMECH (reduced registration fee): 20

Number of non-members of EUROMECH (full registration fee): 22 (according to the declaration of the participants)

Number of participants from each country:

Austria	2	Germany	4	Romania	
Belgium	2	Great Britain	1	Russia	
Byelorussia		Greece		Slovakia	1
Bosnia		Hungary		Slovenia	
Bulgaria		Ireland		Spain	
Croatia		Italy	1	Sweden	
Czech Republic		Latvia		Switzerland	
Denmark		Lithuania		Ukraine	
Estonia		Netherlands	3	Yugoslavia	
Finland		Norway		Turkey	
France	26	Poland		USA	2
Georgia		Portugal		Total	42

Please turn

Scientific Report

The EUROMECH Colloquium 459 'Mechanical behaviour of cellular solids' took place on June 7-10, 2004, in Nancy, on the Campus of the Polytechnic University (INPL). It brought together 42 scientists from 9 European countries and from the US, and was aimed as representing the current state of the art in the growing field of cellular and fibrous materials in Europe.

Cellular solids and fibrous materials have indeed fostered an increasing number of research activities and technological developments in the last decade. Metal foams, for instance, are emerging as a new class of engineering materials, to be used as energy absorbers in packaging and in vehicles, while their low density makes them attractive as core material for structural sandwich panels. Fibrous materials, including clothes, woven and knitted structures, are attractive because of their ease of fabrication, their good in-plane properties and ability to undergo large out-of-plane shape changes. Cellular solids and fibrous materials have in common that they inherit their good (thermo)mechanical properties directly from their network-like microstructure. The overall behaviour depends on:

i) the properties of the constituting solid,
ii) the porosity
iii) 3D morphological information of the network architecture.

As a result, cellular solids and fibrous materials involve similar modelling strategies.

The topics of the Colloquium covered most of the mechanical and material aspects, grouped in the following four sessions:

A. ***Processing and experimental investigation***
B. ***Overall properties and homogenization***
C. ***Scale effects and generalised continuum models***
D. *Woven and fibrous materials*

The duration of the 29 oral presentations (30 minutes) allowed an extensive presentation of the works, which most of the case triggered many questions from the audience. A poster session took place (6 posters), introduced by a short oral presentation of the posters by their author. The participants appreciated the informal and very pleasant atmosphere of the meeting.

The articles from the Colloquium will be published in a special issue of the Journal of Materials Science.

Nancy, June 28, 2004

J.-F. Gaytrotta