

TEXTILE COMPOSITES AND INFLATABLE STRUCTURES

Computational Methods in Applied Sciences

Volume 3

Series Editor

E. Oñate

Textile Composites and Inflatable Structures

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 Springer

A C.I.P. Catalogue record for this book is available from the Library of Congress.

ISBN-10 1-4020-3316-8 (HB) Springer Dordrecht, Berlin, Heidelberg, New York
ISBN-10 1-4020-3317-6 (e-book) Springer Dordrecht, Berlin, Heidelberg, New York
ISBN-13 978-1-4020-3316-2 (HB) Springer Dordrecht, Berlin, Heidelberg, New York
ISBN-13 978-1-4020-3317-9 (e-book) Springer Dordrecht, Berlin, Heidelberg, New York

Published by Springer,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

Printed on acid-free paper

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Printed in the Netherlands.

Table of Contents

Preface	vii
<i>On the Design Process of Tensile Structures</i>	
R. Wagner	1
<i>Systems for Lightweight Structure Design: the State-of-the-Art and Current Developments</i>	
E. Moncrieff	17
<i>Recent Developments in the Analytical Design of Textile Membranes</i>	
L. Gründig, D. Ströbel and P. Singer	29
<i>Finite Element Analysis of Membrane Structures</i>	
R.L. Taylor, E. Oñate and P.A. Ubach	47
<i>Applications of a Rotation-Free Triangular Element for Finite Strain Analysis of Thin Shells and Membranes</i>	
F. Flores and E. Oñate	69
<i>FE Analysis of Membrane Systems Including Wrinkling and Coupling</i>	
R. Rossi, V. Renato and E. Oñate	89
<i>Wrinkles in Square Membranes</i>	
Y.W. Wong and S. Pellegrino	109
<i>FEM for Prestressed Saint Venant-Kirchhoff Hyperelastic Membranes</i>	
A. J. Gil	123
<i>Equilibrium Consistent Anisotropic Stress Fields in Membrane Design</i>	
K.-U. Bletzinger, R. Wüchner and F. Daoud	143
<i>Efficient Finite Element Modelling and Simulation of Gas and Fluid Supported Membrane and Shell Structures</i>	
T. Rumpel, K. Schweizerhof and M. Haßler	153
<i>Widespan Membrane Roof Structures: Design Assisted by Experimental Analysis</i>	
M. Majowiecki	173
<i>Fabric Membranes Cutting Pattern</i>	
B. Maurin and R. Motro	195

<i>Inflated Membrane Structures on the Ground in the Air and in Space - A Classification</i>	
B. Kröplin	213
<i>Post-Tensioned Modular Inflated Structures</i>	
R. Tarczewski	221
<i>Experiences in the Design Analysis and Construction of Low Pressure Inflatable Structures</i>	
J. Marcipar, E. Oñate and J. Miquel Canet	241
<i>Recent Advances in the Rigidization of Gossamer Structures</i>	
B. Defoort, V. Peypoudat, M.C. Bernasconi, K. Chuda and X. Coqueret	259
<i>Form-Optimizing Processes in Biological Structures. Self-generating structures in nature based on pneumatics</i>	
E. Stach	285
<i>Making Blobs with a Textile Mould</i>	
A.C.D. Pronk and R. Houtman	305

PREFACE

The objective of this book is to collect state-of-the-art research and technology for design, analysis, construction and maintenance of textile and inflatable structures.

Textile composites and inflatable structures have become increasingly popular for a variety of applications in - among many other fields - civil engineering, architecture and aerospace engineering. Typical examples include membrane roofs and covers, sails, inflatable buildings and pavilions, airships, inflatable furniture, airspace structures etc.

The ability to provide numerical simulations for increasingly complex membrane and inflatable structures is advancing rapidly due to both remarkable strides in computer hardware development and the improved maturity of computational procedures for nonlinear structural systems. Significant progress has been made in the formulation of finite elements methods for static and dynamic problems, complex constitutive material behaviour, coupled aero-elastic analysis etc.

The book contains 18 invited contributions written by distinguished authors who participated in the International Conference on Textile Computer and Inflated Structures held in Barcelona from June 30th to July 2nd 2003. The meeting was one of the Thematic Conferences of the European Community on Computational Methods in Applied Sciences (ECCOMAS, www.eccomas.org).

The different chapters discuss recent progress and future research directions in new textile composites for applications in membrane and inflatable structures. Approximately half of the book focuses in describing innovative numerical methods for structural analysis, such as new non linear membrane and shell finite elements. The rest of the chapters present advances in design, construction and maintenance procedures.

The content of the different chapters was sent directly by the authors and the editors cannot accept responsibility for any inaccuracies, comments and opinions contained in the text.

The editors would also like to take this opportunity to thank all authors for submitting their contributions.

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