FIBRES & TEXTILES in Eastern Europe

published by

Instytut Biopolimerów i Włókien Chemicznych Institute of Biopolymers and Chemical Fibres (IBWCh), Łodź, Poland

In publishing participates Kaunas University of Technology (KTU), Kaunas, Lithuania

Editorial Office

ul. Skłodowskiej-Curie 19/27, 90-570 Łódź, Poland tel. (48-42) 638-03-00, fax (48-42) 637-65-01 e-mail: infor@ibwch.lodz.pl http://www.fibtex.lodz.pl

Editorial Department

Editor-in-Chief Bogdan Mac V-ce Editor-in-Chief Marta Cyrczak Assistant Editors Emilia Jaszczurska, Anna Wahl

Text Editor Geoffrey Large Typesetting Andrzej Bodek Printed at Media-Press

Editorial Committee

Danuta Ciechańska (IBWCh) Izabela Ciesielska (TUŁ) Włodzimierz Cygan (TUŁ) Karolina Grzebieniak (IBWCh) Ryszard Korycki (TUŁ) Małgorzata Michniewicz (IBWCh) Rimvydas Milašius (KTU) Antoni Niekraszewicz (IBWCh) Zbigniew Stempień (TUŁ) Krystyna Twarowska-Schmidt (IBWCh) Alojzy Urbanowski (IBWCh) Dariusz Wawro (IBWCh)

Scientific Programming Board

Chairman: Prof. Andrzej Ziabicki Polish Academy of Sciences, Warsaw, Poland Members: Prof. Christo Betchev Technical University of Sofia, Bulgaria Prof. Tadeusz Jackowski Technical University of Łódź, Poland Prof. Ryszard Kozłowski Institute of Natural Fibres, Poznań, Poland Prof. Izabella Krucińska Technical University of Łódź, Poland Prof. Anton Marcinčin Slovak University of Technology, Bratislava, Slovak Republic Prof. Józef Masajtis Technical University of Łódź, Poland Prof. Vytautas Milašius Kaunas University of Technology, Lithuania Prof. Jiři Militký Technical University of Liberec, Czech Republic **Prof. Heinrich Planck** Institute for Textile Techniques and Technology, Denkendorf, Germany **Prof. Roshan Shishoo** Institute of Fibres and Polymers Research AB, Mölndol, Sweden **Prof. Sigitas Stanys** Kaunas University of Technology, Lithuania Prof. Zoran Stjepanovič University of Maribor, Slovenia Prof. Janusz Szosland Technical University of Łódź, Poland Prof. Andrzej Włochowicz University of Bielsko-Biała, Poland



FIBRES & TEXTILES in Eastern Europe is decorated with the Golden Order of the Polish Textile Association



Volume 20, No. 2 (91) March / April 2012

ISSN 1230-3666

Fibres & Textiles in Eastern Europe is inserted on the 'ISI Master Journal List' of the Institute for Scientific Information, Philadelphia, USA (for the year 2010 has an Impact Factor of 0.629) and is indexed in Research Alert, SCI Expanded (Sci Search and Web of Science), the Materials Science Citation Index, Current Contents/Engineering, Computing & Technology; as well as by the Textile Institute, Manchester, in the Information Service; and in Toga FIZ Technik; Rapra Technology Ltd.; Elsevier Geo Abstracts; Textiles Eastern Europe - World Textile Publications; Chemical Abstracts Service; and by Referativny Zhurnal.

The content of 'Fibres & Textiles in Eastern Europe' is available by free open access on the website http://www.fibtex.lodz.pl, starting from issue No 3/2002.

In Index Copernicus Journal Master List in 2010 FIBRES & TEXTILES in Eastern Europe ISSN 1230-3666 has received ICV = 13.54.

No part of this publication may be reproduced without the prior written permission of the publisher: Instytut Biopolimerów i Włókien Chemicznych - Institute of Biopolymers and Chemical Fibres.

No responsibility is assumed by the publisher for any injury and/or damage to persons or property as a matter of application of any methods, products, instructions or ideas contained in the material herein. Although all advertising material is expected to conform to ethical standards, inclusion in this publication does not constitute aguarantee or endorsement of the quality or value of such product.

On the cover a fragment of Jolanta Owidzka's structural tapestry 'Prayer book'

This issue is financially supported by the Ministry of Science and Higher Education.