

FIBRES & TEXTILES in Eastern Europe

published by:

RESEARCH NETWORK
ŁUKASIEWICZ



Institute of Biopolymers
and Chemical Fibres

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



Editorial Office

ul. Skłodowskiej-Curie 19/27, 90-570 Łódź, Poland
tel. (48-42) 638-03-63, 638-03-14
e-mail: infor@ibwch.lodz.pl <http://www.fibtex.lodz.pl>

Editorial Department

<i>Editor-in-Chief</i> Emilia Jaszczurska-Niedzwiedzka	<i>Text Editor</i> Geoffrey Large
<i>Vice Editor-in-Chief</i> Marta Cyrczak	<i>Typesetting</i> Beata Gawłowska, Media-Press
<i>Assistant Editor</i> Anna Wahl	<i>Printed at</i> Media-Press

Editorial Committee

Chairman:
Dariusz Wawro (IBWCh)

Members:
Danuta Ciechańska (ITE-PIB)
Izabela Ciesielska-Wróbel (UGent, NCSU)
Włodzimierz Cygan (TUL)
Zdzisław Czapliski (INFMP)
Robert Drobin (UB-B)
Radosław Dziuba (UL)
Katarzyna Grabowska (TUL)
Ryszard Korycki (TUL)
Bipin Kumar (HKPU)
Bogdan Mac (IBWCh)
Adnan Mazari (TUL)
Małgorzata Michniewicz (IBWCh)
Zbigniew Mikołajczyk (TUL)
Daiva Mikučionienė (KTU)
Monika Rom (UB-B)
Sigitas Stanys (KTU)
Zbigniew Stępień (TUL)
Krystyna Twarowska-Schmidt (IBWCh)
Alojzy Urbanowski (IBWCh)

Scientific Board

Chairman:
† Prof. Andrzej Ziabicki
Polish Academy of Sciences, Warsaw, Poland

Members:
Prof. Valery Bashmetau
Vitebsk State Technological University, Belarus
Prof. Andrzej Błędzki
West Pomeranian University of Technology Szczecin, Poland
Prof. Chokri Cherif
Technical University of Dresden, Germany
Prof. Hans-Peter Fink
Potsdam-Golm, Germany
Prof. Lubos Hes
Technical University of Liberec, Czech Republic
Prof. Tadeusz Jackowski
Lodz University of Technology, Poland
Prof. Vladan Koncar
GEMTEX laboratory, ENSAIT, Roubaix, France
Prof. Ryszard Kozłowski
Institute of Natural Fibres and Medical Plants, Poznań, Poland
Prof. Izabella Krucińska
Lodz University of Technology, Poland
Prof. Anton Marcinčin
Slovak University of Technology, Bratislava, Slovak Republic
Prof. Józef Masajtis
Lodz University of Technology, Poland
Prof. Rimvydas Milašius
Kaunas University of Technology, Kaunas, Lithuania
Prof. Jiří Milátký
Technical University of Liberec, Czech Republic
Prof. Heinrich Planck
Denkendorf, Germany
Prof. Zoran Stjepanović
University of Maribor, Slovenia
Prof. Lieva Van Langenhove
Gent University, Belgium

July/August 2019
Volume 27, No. 4 (136)
ISSN 1230-3666
IF 0.677 (2018)
5 – Year Impact Factor 0.795
ICV 148.26 (2017)

FIBRES & TEXTILES in Eastern Europe is inserted on the Master Journal List of Clarivate Analytics Philadelphia, USA and on Index Copernicus Journal Master List. The journal is indexed in Research Alert, SCI Expanded (Sci Search and Web of Science), the Materials Science Citation Index, Current Contents/Engineering, Computing & Technology; the Textile Institute, Manchester, in the Information Service; Rapra Technology Ltd.; Elsevier Geo Abstracts; Chemical Abstracts Service; and Referativny Zhurnal, among others.

No part of this publication may be reproduced without the prior written permission of the publisher: ŁUKASIEWICZ Research Network – 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 a guarantee 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 of the Republic of Poland within the science dissemination program (No. 678/P-DUN/2018).