

# ТЕКСТИЛ СБЛЕКИ

НТС по текстил,  
облекло и кожи



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SPECIAL ISSUE 10/2018

## BOOK OF ABSTRACTS

# NATIONAL TEXTILE CONFERENCE - 2018

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Assoc. Prof. Ivelin Rahnev, College of Sliven at the Technical University of Sofia

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# **XX National Textile Conference - Sofia**

**02 - 04.10.2018 г**

The National Textile Conference on "Traditions and Innovations in Textiles and Garment" was held for the 20th time from 2 to 4 October 2018 in Sofia.

Organizer of the conference is the Scientific Engineering Union of Textile, Garment and Leathers, and hosted by Inter Expo Center Ltd. - Sofia. Within the framework of the research association the co-organizers of the conference were the Technical University - Sofia and its branch "Faculty and College - Sliven", the Institute of Polymers at the Bulgarian Academy of Sciences. Partners of the events in the conference were the university departments and the secondary schools in the country as well as the Federation of Scientific Engineering Unions in Bulgaria.

The Scientific and Organizational Committees of the Conference under the leadership of Professor Hristo Petrov provided excellent conditions for the presentation of the various works and discussions in the side-lines.

The first important event of NTC2018 was the meeting - round table "Staffing and Attractiveness of the Textile Profession". Representatives of state and public organizations, as well as representatives of the trade unions, the university community and teachers attended the meeting from the vocational and specialized secondary schools.

Over 50 university lecturers, researchers, experts, PhD students and students participated in the scientific sessions of the forum. Out of the 52 abstracts submitted in the program of the Scientific Sessions, 30 reports and 15 posters on the current trends in the technology of textiles, garment and design were presented.

All reported works reflect the efforts of research, university and industrial teams from the specialized departments and laboratories of TU - Sofia, UCTM - Sofia, NBU - Sofia, National Academy of Arts - Sofia, Institute of Polymers of the Bulgarian Academy of Sciences, Defense Institute - Sofia, SWU - Blagoevgrad, VFU "Chernorizets Hrabar" - Varna and MBBU - Botevgrad, PGTO Dobri Zhelyazkov - Sliven, NNG Dimitar Dobrovich - Sliven, Secondary school "Metodiy Draginov", Draginovo, Municipality of Velingrad, Bulgaria and the Museum of Textile Industry in Sliven.

The conference was attended by leading lecturers from the University of Haute Alsace in Mulhouse, France, Hanoi University of Science and Technology, SR Vietnam, University "Ss. Cyril and Methodius" - Skopje, Republic of Macedonia.

The conference ended with the awarding of the finest diploma theses and student projects. The submissions of the National Textile Conference 2018 will be published sequentially in the issues of the Textiles and Garment Magazine ISSN1310-912X (print), ISSN 2603-302X (online), which will be available to readers in university and public libraries as well as to the websites of SEUTGL: [www.tok.fnts.bg](http://www.tok.fnts.bg) and the publishing house of the association: [www.bgtextilepublisher.org](http://www.bgtextilepublisher.org).

Compiled by:

Assoc. Prof. Ivelin Rahnev, PhD,  
Chair of the Organizing Committee of NTC2018  
SEUTGL

# DAILY SCHEDULE

## Of the XX National Textile Conference - NTC18

### at the Inter Expo Centre - Sofia

<b>1. First day: 02.10.2018</b>			
1.1.	13h00	Accommodation in hotel ATM - Sofia	<b>ATM, reception</b>
1.2.	14h00	Registration in NTC18	IEC, hall Musala
1.3.	14h30	Workshop "Staffing and attractiveness of the textile profession"	IEC, hall Musala
1.4.	16h00	Visit to the exposition of TMT Expo 2018	IEC, halls 1 and 4
<b>1.5.</b>	<b>18h30 - 21h00</b>	<b>Welcome cocktail of the NTC18</b>	<b>IEC, central foyer</b>
<b>2. Second day: 03.10.2018 g.</b>			
2.1.	08h15 - 08h30	<i>Registration in the NTC18</i>	IEC, hall Musala
2.2.	08h30 - 09h45	5 presentations x 15 minutes, 5 reports	IEC, hall Musala
2.3.	09h45 - 10h00	<i>Coffee-break with poster session</i>	IEC, hall Vihren
2.4.	10h00 - 11h00	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
2.5.	11h00 - 11h15	<i>Coffee-break with poster session</i>	IEC, hall Vihren
2.6.	11h15 - 12h00	3 presentations x 15 minutes, 3 reports	IEC, hall Musala
<b>2.7.</b>	<b>12h00 - 12h45</b>	<b>Working lunch</b>	<b>IEC, hall Musala</b>
2.8.	12h45 - 13h15	4 presentations x 15 minutes, 4 reports	IEC, hall Rila
2.9.	13h15 - 13h30	<i>Coffee-break with youth's exposition</i>	IEC, hall Vihren
2.10.	13h30 - 14h30	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
2.11.	14h30 - 14h45	<i>Coffee-break with youth's exposition</i>	IEC, hall Vihren
2.12.	14h45 - 15h45	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
2.13.	15h45 - 16h00	<i>Coffee-break with youth's exposition</i>	IEC, hall Vihren
2.14.	16h00 - 17h00	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
2.15.	17h00 - 18h00	Visit to the youth's exposition	IEC, hall 4
<b>2.16.</b>	<b>19h30 - 22h00</b>	<b>Gala dinner</b>	<b>ATM, restaurant</b>
<b>3. Third day: 04.10.2018 g.</b>			
3.1.	08h15 - 08h30	Registration in the NTC18	IEC, hall Musala
3.2.	08h30 - 09h30	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
3.3.	09h30 - 09h45	<i>Coffee-break with youth's exposition</i>	IEC, hall Vihren
3.4.	09h45 - 10h45	4 presentations x 15 minutes, 4 reports	IEC, hall Musala
3.5.	10h45 - 11h00	<i>Coffee-break with youth's exposition</i>	IEC, hall Vihren
3.6.	11h00 - 11h45	3 presentations x 15 minutes, 3 reports	IEC, hall Musala
<b>3.7.</b>	<b>12h00 - 13h30</b>	<b>Working lunch</b>	<b>ATM, restaurant</b>
3.8.	13h30 - 14h00	Award ceremony of the youth competition - 2018	ATM, restaurant
<b>3.9.</b>	<b>14h00 - 14h15</b>	<b>Closing the conference</b>	<b>ATM, restaurant</b>

- Inter Expo Center Ltd., 147, Tsarigradsko shose Blvd., 1784 Sofia, Bulgaria,  
<https://iec.bg/index.php/bg/> - IEC; TMT Expo 2018, [www.tmtexpo.bg](http://www.tmtexpo.bg);
- Hotel ATM Center, Tsarigradsko Shosse 131, Sofia 1784, <http://www.atm-hotel.com/> - ATM.

## **SCIENTIFIC COMMITTEE**

of the 20<sup>th</sup> National Textile Conference, Sofia, Bulgaria, October 2-4<sup>th</sup> 2018

### **HONORABLE MEMBERS**

1. Prof. Ivan GEORGIEV, PhD, Technical University (TU) - Sofia
2. Prof. Nikolay SIMEONOV, DSc, University of Chemical Technology and Metallurgy (UCTM) - Sofia
3. Prof. Iliya RASHKOV, DSc, corr.-member of the Bulgarian Academy of Sciences (BAS), Institute of Polymers - Sofia
4. Prof. Philipp PHILIPPOV, DSc, TU - Sofia, corr.-member of BAS
5. Prof. Margarita NEZNAKOMOVA, PhD, TU - Sofia
6. Assoc. Prof. Anna GEORGIEVA, PhD, UCTM - Sofia

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8. Prof. Dr Savvas VASSILIADIS, Piraeus University of Applied Sciences, Greece
9. Prof. Dr. Yordan KYOSEV, Hochschule Niederrhein, Mönchengladbach, Germany
10. Prof. Goran DEMBOSKI, PhD, University "Ss. Cyril and Methodius" - Skopje
11. Assoc. Prof. VU Thi Hong Khanh, PhD, Hanoi University of Science and Technology - STLF, Vietnam
12. Dr Gaetano RIMINI, "E. Miroglino" EAD - Sliven

### **RESPONSIBLE REVIEWERS FOR THE SCIENTIFIC PROGRAM**

13. Prof. Hristo PETROV, PhD, TU - Sofia, Chairman of the Conference
14. Prof. Peter PETROV, DSc, Institute of Electronics at BAS - Sofia
15. Prof. Diana GERMANOVA-KRASTEVA, PhD, TU - Sofia
16. Prof. Maya BOGDANOVA, National Academy of Arts (NAA) - Sofia
17. Prof. Vihroni POPNEDELEV, NAA - Sofia
18. Prof. Emiliya PANAYOTOVA, PhD, New Bulgarian University (NBU) - Sofia
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20. Assoc. Prof. Radostina ANGELOVA, DSc, TU - Sofia
21. Assoc. Prof. Stela BALTOVA, PhD, International Business School - Botevgrad
22. Assoc. Prof. Zlatina KAZLACHEVA, PhD, Trakia University - Stara Zagora
23. Assoc. Prof. Snejina ANDONOVA, PhD, South-West University - Blagoevgrad
24. Assoc. Prof. Krassimir DRUMEV, PhD, TU - Gabrovo

## **ORGANIZING COMMITTEE**

of the 20th National Textile Conference, Sofia, Bulgaria, October 2-4<sup>th</sup> 2018

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1. Assoc. Prof. Ivelin RAHNEV, PhD, TU - Sofia, Chairman of the organizing committee
2. Assoc. Prof. Ivelina VARDEVA, PhD, University Asen Zlatarov - Bourgas
3. Assoc. Prof. Desislava Staneva-GRABTCHEVA, PhD, UCTM - Sofia
4. Assoc. Prof. Maria SPASOVA, PhD, IP - BSA - Sofia
5. Assoc. Prof. Violeta SLAVOVA, PhD, TU - Sofia
6. Assistant Prof. Nezabrvaka POPOVA-NEDYALKOVA, PhD, NBU - Sofia
7. Eng. Nikolina GENTCHEVA - "Preventa" OOD - Sofia
8. Eng. Marin Marinov, "Iskra" OOD - Parvomay
9. Eng. Nikolay ZLATANOV, ID Cvetan Lazarov - Sofia
10. Eng. Daniela KARAMANOVA, HVSTG "Dobri Jelyazkov" - Sliven
11. Alexander DOYTCHINOV, NAHS "Dimitar Dobrovich" - Sliven
12. Toni DIMITROVA, Museum of the textile industry - Sliven
13. Eng. Danail JORDANOV, "E.Miroglie" - Sliven
14. Eng. Umme KAPANYK, "Stil" OOD - Gotze Delcthev
15. Martin KIROV, ceo, "Smart Textilchemie" Ltd.
16. Assistant Prof. Eng. Kaloyan DIMITROV, TU - Sofia

*XIX bgnNC 2018*

**Scientific Association:**

Technical University of Sofia  
University of Chemical Technology and Metallurgy  
of Sofia

Technical University of Gabrovo

Trakia University, Faculty of Technics and

Technologies of Yamboł

South-West University of Blagoevgrad

New Bulgarian University of Sofia

Bulgarian Academy of Science, Laboratory of Bio  
Active Polymers

Bulgarian Academy of Science, Laboratory of  
Physical Technology of Sliven

**The main organizer:**

SCIENTIFIC ENGINEERING UNION OF  
TEXTILE, GARMENT AND LEATHER,  
BULGARIA

Dimitar Dobrovich National High School of Fine

Arts of Sliven

Museum of the Textile Industry in Sliven

**Co-organiser:**

Scientific Engineering Union of  
Textile, Garment and Leather, Bulgaria

**Address of correspondence:**

Rakovski 108, 1000, Sofia, Bulgaria  
Phone: +359 2 980 30 45

**Secretary: Mrs Tomina Galibova**

E-mail: [tok.secretary@fnts.bg](mailto:tok.secretary@fnts.bg)

**Fees:**

- 60 BGN for university participants;
- 120 BGN for business participants.

**The fee covers:**

- Cocktail and Official Dinner;
- Coffee breaks;
- Participations in the conference sessions;
- Publication of the presented papers in «Textile and Garment magazine»
- ISSN 1310-912X (print),  
ISSN 2603-302X (Online), the journal of the Scientific Engineering Union of Textile, Garment and Leathers.

**Organising Association:**

Federation of the Scientific Engineering Unions

Regional SEU of TGL of Plovdiv

Regional SEU of Gabrovo

Dobri Zhelyazkov Professional High School of  
Textile and Clothing of Sliven

Dimitar Dobrovich National High School of Fine

Arts of Sliven

Museum of the Textile Industry in Sliven

**with the household of**

Inter Expo Center Ltd - Sofia  
And  
ATM Hotel in Sofia,

Within the "Days of Science"  
At TU - Sofia,

in collaboration with the departments of  
textile and design

XX NATIONAL TEXTILE  
CONFERENCE 2018  
"Traditions and Innovations in  
Textile and Garment"

October 2-4<sup>th</sup> 2018

Inter Expo Center Ltd. - Sofia  
147, Tsarigradsko chaussee Blvd.  
1794 Sofia, Bulgaria

Bank account:  
UniCredit Bulbank, Bulgaria  
IBAN: BG43 UNCR 9660 1010 6722 00,  
BIC: UNCRBGGSF  
VAT: BG12111930

## Main Topics:

- Fibres and Yarns; Chemical Technologies;
- Nanotechnologies
- Textile Technologies: Spinning, Weaving, and Knitting
- Apparel Technology
- Textile art and Fashion Design
- Textile Machinery and Equipment
- Textile Management, Marketing and Sustainability
- Innovations in Textile Education

## XX National Textile Conference 2018

October 2018, Sofia, Bulgaria  
Inter Expo Center Ltd.  
147, Tsarigradsko chaussee Blvd.  
1784 Sofia, Bulgaria

## Registration Form

- Name .....  
Surname .....
- Institution .....
- Address:.....
- e-mail, phone:.....
- The Title of the Paper:.....
- The Topic of the Paper:.....
- DEADLINES
- Abstract:
  - ◆ In English
  - ◆ The abstract should to be prepared according to the abstract template and should be restricted to maximum 1 page
- Presentation:
  - ◆ The abstracts will be published in «Textile and Garment Magazine» issue 10/2018
  - ◆ The registration form should be send to tok.secretary@fnts.bg
- 
- Oral Presentation [REDACTED]  
Poster Presentation [REDACTED]
- 
- The registration form should be send to tok.secretary@fnts.bg
- Languages: Bulgarian and English
- ◆ Maximum 14 slides
  - ◆ The presentation should to be prepared with MS Office - Power Point
  - ◆ The presentation should to be no longer than 15 min.
- Poster:
  - ◆ In English or Bulgarian
  - ◆ Format A2
- Paper:
  - ◆ In English or Bulgarian
  - ◆ The paper should to be prepared according to the paper template and should be restricted to maximum 12 pages
- Templates are available online at: [www.tok.fnts.bg](http://www.tok.fnts.bg)
- ◆ The papers will be published in «Textile and Garment magazine», ISSN 1310-912X (print), ISSN 2603-302X (Online), issues from 11/2018 to 9/2019

## **TEXTILE AND GARMENT MAGAZINE - GENERAL DESCRIPTION**

According to data by SS. Cyril and Methodius National Library Sofia (<http://www.nationallibrary.bg>), the specialised Textile and Garment Magazine has been issued, without interruption, since 1949 and is the successor of Textile Review, which had been published in 1931 and 1932 in Sliven, with Editor-in-Chief P. Starbanov.

Inspired by the creators of the departments in Textiles at the Technical University of Sofia and the University of Chemical Technology and Metallurgy - Sofia, Prof. Agop Kevorkian and Prof. Kiril Dimov, the magazine has a scientifically applied character and publishes author's papers of lecturers from universities and research units as well as from vocational high schools in textiles, clothing and design.

The magazine also publishes materials from textiles and clothing industries.

The purpose of the magazine is to present to the highly specialized community in the country and abroad the achievements of the theoretical and experimental research of scientists and specialists from all points of view of textile science and practice.

The main topics of the published papers comprise chemical and mechanical technology of textile materials, technology and design of sewing products, textile art, textiles industry economics and the pedagogy of textiles training and education.

Editorial Board of the magazine does the selection and review of the papers collectively while over the years its Editors-in-Chief have been:

Assoc. Prof. Ivelin Rahnev - from 2015 until present;  
Prof. Ivan Georgiev - from 2000 to 2015;  
Prof. Georgi Nikolov Georgievich - from 1996 to 2000;  
Prof. Ivan Hardalov - from 1995 to 1996;  
Eng. Svilena Kissyova - from 1990 to 1995;  
Prof. Petar Adarov - from 1984 to 1987  
Prof. Atanas Chervendinev - from 1964 to 1984;  
Editorial Board - from 1958 to 1963;  
K. Pastarmadzhiev - from 1952 to 1957;  
Stanka Tsekova - from 1950 to 1951;  
Editorial Committee - since 1949.

Title of the magazine in Bulgarian: Текстил и облекло (Tekstil i Obleklo).

Title of the magazine in English: Textiles and Garments magazine.

The publisher of the magazine is:

The Scientific and Engineering Union of Textiles, Garments and Leather (SEUTGL)

UIC: 121111930, Bg121111930

Place of publishing: Sofia, Bulgaria

Status of the edition - currently published with:

ISSN 1310-912X (print) for the printed edition in hard copy;

ISSN 2603-302X (Online) for the printed online edition.

The Textiles and Garments magazine was first published online under its current title in 1996 with the 1st issue - Textiles and Garments, ISSN 1310-912X at [www.tok-bg.org](http://www.tok-bg.org).

Since 2016, the issues under the same title: Textiles and Garments and with the same ISSN: 1310-912X have been available at [www.tok.fnts.bg](http://www.tok.fnts.bg).

Since 2018, the issues under the same title: Textiles and Garments and with online ISSN 2603-302X are available at [www.bgtextilepublisher.org](http://www.bgtextilepublisher.org).

Periodicity: 10 - 12 issues per year.

Format of the print and online edition: A4 with 10 quires (A3), including one quire for the colour cover and nine black and white quires for the paper's body of the magazine.

Language of the text: mainly in Bulgarian, abstracts - in English and some whole articles - in English the working language of foreign authors.

Origin of the published materials:

author's works by lecturers, researchers and specialists;  
papers presented at conferences and other forums

Subject to Universal Decimal Classification - UDC (УДК):

33, Economics. Economic sciences.

377, Special Education. Vocational education. Vocational schools.

378, Higher Education / Higher Education Institutions.

677, Textile Industry. Technology of textile materials.

678, Industry of High Molecular Substances. Rubber industry. Plastic industry.

687, Tailoring (apparel) Industry.

745/749, Applied Art. Art Crafts. Interior. Design.

658.512.23, Artistic design (industrial design).

URL: [www.tok.fnts.bg](http://www.tok.fnts.bg)

[www.bgtextilepublisher.org](http://www.bgtextilepublisher.org)

Previous title and continuity of the magazine for the period of issue:

Since 1996: Textiles and Garments, ISSN 1310-912X (Print), ISSN 2603-302X (Online);

From 1990 to 1996: Textiles Industry, ISSN 1310-8069;

From 1985 to 1987: Light Industry and Services, ISSN 0205-1885;

From 1959 to 1996: Textiles Industry, ISSN 0495-0046;

From 1958 to 1958: Light industry: Textiles, ISSN 0455-6208;

From 1957 to 1957: Light industry: Textiles' edition, ISSN C625-9138;

From 1952 to 1957: Light industry, ISSN C617-924X;

From 1949 to 1950: Industry: a monthly edition of the Ministry of Industry, ISSN C616-9929.

Contact information:

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Address: 1000 Sofia, 108, Rakovski Str., Room 407

Phone: 00359 2 980 3045, 00359 895 586 651

URL: [www.tok.fnts.bg](http://www.tok.fnts.bg)

Sofia, March 2018

Ivelin Rahnev

# INFORMATION FOR AUTHORS

## SUBMISSION OF A MANUSCRIPT

- **Subject area.** The problems should concern problems of the textile science and practice following the Universal Decimal Classification - UDC:
  - 33, Economics. Economic sciences.
  - 377, Special Education. Vocational education. Vocational schools.
  - 378, Higher Education / Higher Education Institutions.
  - 677, Textile Industry. Technology of textile materials.
  - 678, Industry of High Molecular Substances. Rubber industry. Plastic industry.
  - 687, Tailoring (apparel) Industry.
  - 745/749, Applied Art. Art Crafts. Interior. Design.
  - 658.512.23, Artistic design (industrial design).
- **Submission of a manuscript** should be addressed to the Editorial Office via e-mail ([textilejournal.editor@fnts.bg](mailto:textilejournal.editor@fnts.bg)), the paper should be written in Bulgarian from Bulgarian authors and in English (working language) for foreigners.
- **Copyright Transfer Agreement** must be signed and returned to our Editorial Office by mail, fax or e-mail as soon as possible, after the preliminary acceptance of the manuscript. By signing this Agreement, the authors warrant that the entire work is original and unpublished, it is submitted only to this journal and all the text, data, Figures and Tables included in this work are original and unpublished and have not been previously published or submitted elsewhere in any form. Please note that the reviewing process begins as soon as we receive this document. In the case when the paper has already been presented at a conference, it can be published in our magazine only if it has not been published in generally available conference materials; in such case, it is necessary to give an appropriate statement placed in Editorial notes at the end of the article.

## GENERAL STYLE AND LAYOUT

- **Volume of a manuscript** submitted should not exceed 12 standard journal pages in single column (3600 characters per page), including tables, figures and photographs. Format of the submitted file is MS Office Word (normal layout). The editors reserve the right to shorten the article if necessary as well as to alter the title.
- **Title of a manuscript** should not exceed 120 characters.
- **Full names and surnames of the authors**, as well as full **names of the authors' affiliation** - faculty, department, university, institute, company, town and country should be clearly given. Corresponding author should be indicated, and their e-mail address provided.
- **Abstract of a manuscript** should be in English and no longer than one page.
- **Key-words** should be within 4-6 items.
- For papers submitted in English (any other working language), the authors are requested to submit a copy with a title, abstract and key words in Bulgarian.
- **SI units** should be used throughout.
- **Abbreviations** should be used according to IUPAC and ISO standards and defined when first used.
- **Figures** and illustrations with a title and legend should be numbered consecutively (with Arabic numerals) and must be referred in the text. Photographs should be numbered as Figures. Additionally, Figures should be integrated in the text with format **JPG at 300 dpi minimum**. Figures must be integrated in the text in **editable form**.
- **Tables** with a title and optional legend should be numbered consecutively and must be referred in the text.
- **Acknowledgements** may be included and should be placed after Conclusions and before References.
- **Footnotes** should be avoided. When their use is absolutely necessary, they should be numbered consecutively using Arabic numerals and appended at the end of the manuscript.
- **References (bibliography)** should be cited consecutively in order of appearance in the text, using numbers in square brackets, according to the **Vancouver system**.

## REVIEWING PROCEDURE

The reviewing procedure for Textile and Garment Magazine is in accordance with the guidelines of the Ministry of Education and Science and can be presented as follows:

- Each paper submitted for publication is reviewed by at least two independent reviewers working in an institution different than the author's affiliation. The identity of the author/authors is concealed from the reviewers and vice-versa (**double-blind review**). In the case of controversial opinions of the reviewers, next reviewers are selected.
- A written review includes a clear conclusion of the article reviewed, concerning the conditions, which must be fulfilled in order to publish the article in Textile and Garment Magazine or a statement rejecting the article.
- First author receives a set of reviews and next, following the reviewing procedure, is obliged to correct the paper according to the reviewers' remarks or express his/her own opinion in writing.
- The corrected article and author's attitude are checked by the editors or by the same reviewers in case of any doubts. The Chairman of the Editorial Board takes by the Editor-in-Chief or, in extraordinary cases, the final decision regarding the publication of the article. If necessary, the authors are informed about the decision by e-mail.
- The identity of the reviewers of the particular articles is not given to public information.

## **ОРГАНИЗАЦИОНЕН КОМИТЕТ**

на Националната текстилна конференция, октомври 2018 година

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