

Acknowledgment

This work was supported by the Grant Agency of the Czech Republic-Grant No. 101/09/0466.

References

1. Morton W. E., Hearle, J. W. S.: *Physical properties of textile fibres*, Manchester & London, The Textile Institute, Butterworths, 1962.
2. Gersak J., Gotlih K., Zunic Lojen D., Rudolf A.: *Influence of dynamic loading on rheological properties of textile material*, *International Journal of Clothing Science and Technology*, Vol. 10, No. 6, 1998, pp. 60-62.
3. Vlasenko V., Kovtun, S., Arabuli, A., Bereznenko, S.: *Application of the longitudinal resonance vibration method for an investigation of a textile's visco-elastic properties* *Vlakna a Textil*, Vol. 14, No. 2, 2007, pp. 11-14.
4. Nosek S.: *Straining of various linear textile bodies in generalized drawing fields, mainly in warps on looms*, *Book of proceedings, Conference Textile Science*, pp. 125-138, Technical University of Liberec, Czech Republic, 1998.
5. Rektorys K. at all: *Přehled užití matematiky – 2. díl*, 720 pages, Prométheus, 2009, ISBN 978-80-7196-180-2.
6. Snycerski M.: *The pulsator - a generator of cyclic longitudinal impact loads to simulate weaving conditions for warp yarn*, *Fibres and Textiles in Eastern Europe*, Vol. 5 No. 4(19), 1997, pp. 65-67.
7. Tumajer P., Bílek M., Strašáková P.: *Mutual action force between weaving machine and textile material*, *Book of proceedings, X. International Conference on the Theory of Machines and Mechanisms*, 2.9 - 4.9.2008, pp. 665-670, Technical University of Liberec – Department of Textile Machines Design, Liberec, Czech Republic, 2008, ISBN 978-80-7372-370-5, UT ISI:000259441500108.
8. Bílek M., Tumajer P.: *Behaviour of textiles under high frequency stress*, *Acta Universitatis Cibiniensis*, Vol. LVIII, 2009, pp. 8-13, „Lucian Blaga” University of Sibiu, Romania, ISSN 1583-7149.
9. Ursíny, P., Bílek, M., Tumajer, P., Moučková, E.: *Simulation des Textilmaterialverhaltens während des Webprozesses*, *Sammelbuch des Vortrages*, 12. Chemnitzer Textiltechnik-Tagung Innovation mit textilen Strukturen, pp. 314 – 321, 30.9.-1.10.2009, Technische Universität Chemnitz, Germany, 2009, ISBN 978-3-9812554-3-0.
10. Tumajer, P., Ursíny, P., Bílek, M., Moučková, E.: *Influence of stress frequency on deformation properties of threads*, *Proceedings of Texsci 2010 (CD-Book of Full Textes)*, 7th International Conference Textile Science TEXSCI 2010, p. 55, Technical University of Liberec, Liberec, Czech Republic, 2010., ISBN 978-80-7372-638-6.

Technical University of Lodz Faculty of Material Technologies and Textile Design

Department of Material and Commodity Sciences and Textile Metrology

Activity profile: The Department conducts scientific research and educational activities in a wide range of fields:

- Material science and textile metrology
- Structure and technology of nonwovens
- Structure and technology of yarns
- The physics of fibres
- Surface engineering of polymer materials
- Product innovations
- Commodity science and textile marketing

Fields of cooperation: innovative technologies for producing nonwovens, yarns and films, including nanotechnologies, composites, biomaterials and personal protection products, including sensory textronic systems, humanoecology, biodegradable textiles, analysis of product innovation markets, including aspects concerning corporate social responsibility (CSR), intellectual capital, and electronic commerce.

Research offer: A wide range of research services is provided for the needs of analyses, expert reports, seeking innovative solutions and products, as well as consultation on the following areas: textile metrology, the physics of fibres, nonwovens, fibrous composites, the structure and technology of yarns, marketing strategies and market research. A high quality of the services provided is guaranteed by gathering a team of specialists in the fields mentioned, as well as by the wide range of research laboratories equipped with modern, high-tech, and often unique research equipment. Special attention should be paid to the unique, on a European scale, laboratory, which is able to research the biophysical properties of textile products, ranging from medtextiles and to clothing, especially items of special use and personal protection equipment. The laboratory is equipped with normalised measurement stations for estimating the physiological comfort generated by textiles: a model of skin and a moving thermal manikin with the options of 'sweating' and 'breathing'. Moreover, the laboratory also has two systems for estimating sensory comfort – the Kawabata Evaluation System (KES) and FAST.

Educational profile: Educational activity is directed by educating engineers, technologists, production managers, specialists in creating innovative textile products and introducing them to the market, specialists in quality control and estimation, as well as specialists in procurement and marketing. The graduates of our specialisations find employment in many textile and clothing companies in Poland and abroad. The interdisciplinary character of the Department allows to gain an extraordinarily comprehensive education, necessary for the following:

- Independent management of a business;
- Working in the public sector, for example in departments of control and government administration, departments of self-government administration, non-government institutions and customs services;
- Professional development in R&D units, scientific centres and laboratories.

For more information please contact:

Department of Material and Commodity Sciences and Textile Metrology
Technical University of Lodz
ul. Żeromskiego 116, 90-924 Łódź, Poland
tel.: (48) 42-631-33-17 e-mail: nonwovens@p.lodz.pl web site: <http://www.k48.p.lodz.pl/>

Received 14.12.2010 Reviewed 08.04.2011