

10. Carr W, Posey J E and Tincher W C. Frictional characteristics of apparel fabrics. *Text Res J* 2003; 73: 606.
11. Gupta B S and El Mogahzy Y E. Friction in fibrous materials. *Text Res J* 1991; 547-555.
12. Fontaine S, Marsiquet C, Renner M and Bueno M. Characterisation of roughness-friction: Example with nonwovens. *Text Res J* 2005; 75(12): 826-832.
13. Kalebek and Babaarslan O. Effect of weight and applied force on the friction coefficient of spunlace nonwoven fabrics. *Fibres and Polymers* 2010; 11, 2: 277-284.
14. Howell H G and Mazur J. Amonton's law and Friction. *J. Text Inst* 1953; 44: T59.
15. Ajayi J O, Elder H M, Kolawole E G, Bello K A and Darma M U. Resolution of the stick-slip friction traces of fabrics. *J. Text Inst* 1995; 86, 4: 600-609.
16. Das A, Kothari V K and Vandana N. A study of frictional characteristics of woven fabrics. *Autex Res J* 2005; 5, 3: 133-140.
17. Wilson D. Study of Fabric-on-Fabric dynamic friction. *J. Text Inst* 1963; 54, 4: T143-T155.
18. Howell H G, Mieszkis K W and Tabor D. *Friction in Textiles*, Butterworths Scientific Publications, London, 1959.
19. Ramkumar S S. Tribology of textile materials. *Ind. J. fibre & Text Res* 2000; 25: 228.
20. Derler S, Schrade U and Gerhardt LC. Tribology of human skin and mechanical equivalents in contact with textiles. *J. Wear* 2007; 263: 1112-1116.
21. Sivamani R and Gitit N. *Tribol. Trans* 2004; 47: 461.
22. Dowson D. Tribology and skin surface, Bioengineering of the skin; skin surface imaging and analysis. *Boca Raton: CRC Press, Boca Raton* 1997; 159-179.
23. Cottenden A M, Wong W K, Cottenden D J and Farbot A. Development and validation of a new method for measuring friction between skin and nonwoven materials. *J. of Engg in medicine* 2008, 222(5): 797. PubMed Id:18756696.
24. Moore D F. *The friction and lubrication of elastomers*, Pergamon Press, Oxford, 1972.
25. Wolfram L J. Friction of skin. *J. Soc. Cosmetic Chem.* 1983; 34: 465-476.
26. Bowden E P and Tabor D. *The friction and lubrication of solids*, Oxford University Press, London, 1954, 90.
27. Derler S, Gerhardt L-C, Lenz A, Bertiaux E and Hadad M. Friction of human skin against smooth rough glass as a function of the contact pressure. *Tribology International* 2009; 42: 1565-1574.
28. Koudine AA, Barquins M, Anthoine P, Aubert L and Leveque J-I. Frictional properties of skin: proposal of a new approach. *Intl Jour of Cosmetic Science*, 2000; 22(1): 11-20.



# Institute of Biopolymers and Chemical Fibres Laboratory of Microbiology

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**Tests within the range of textiles' bioactivity - accredited by the Polish Centre of Accreditation (PCA):**



AB 388

- antibacterial activity of textiles **PN-EN ISO 20743:20013**
- method of estimating the action of micro-fungi **PN-EN 14119:2005 B2**
- determination of antibacterial activity of fibers and textiles **PN-EN ISO 20645:2006**.
- method for estimating the action of micro-fungi on military equipment **NO-06-A107:2005** pkt. 4.14 i 5.17



## Tests not included in the accreditation:

- measurement of antibacterial activity on plastics surfaces **ISO 22196:2011**
- determination of the action of microorganisms on plastics **PN-EN ISO 846:2002**

*A highly skilled staff with specialized education and long experience operates the Laboratory. We are willing to undertake cooperation within the range of R&D programmes, consultancy and expert opinions, as well as to adjust the tests to the needs of our customers and the specific properties of the materials tested. We provide assessments of the activity of bioactive textile substances, ready-made goods and half products in various forms. If needed, we are willing to extend the range of our tests.*

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