

15. Deniz DD, Kadoğlu H. Electromagnetic Shielding Characterization of Conductive Woven Fabrics Produced with Silver-Containing Yarns. *Textile Research Journal* 2015;85,10:1009-1021.
16. Das AJ, Krishnasamy JR, Alagirusamy RA, Basu A. Electromagnetic Interference Shielding Effectiveness of Ss/Pet Hybrid Yarn Incorporated Woven Fabrics. *Fibers and Polymers* 2014;15,1:169-174.
17. Zhe L, Yongheng Z, Xing R, Xiuchen W. Influence of Metal Fibre Content of Blended Electromagnetic Shielding Fabric on Shielding Effectiveness Considering Fabric Weave. *Fibres & Textiles in Eastern Europe* 2015; 23,4: 83-87.
18. Örtlek HG, Çalışkan Ç, Kurban R. A Comparative Study on the Physical Properties of Hybrid Yarns Containing Copper Wire. *Journal of Textiles and Engineer* 2013;20,89:11-20.
19. Perumalraj R, Dasaradan BS. Tensile Properties of Copper Core Yarn. *Journal of Reinforced Plastics and Composites* 2010;29,11:1688-1701.
20. Bedeloglu A, Sunter N. Investigation of Polyacrylic/Metal Wire Composite Yarn Characteristics Manufactured on Fancy Yarn Machine. *Materials and Manufacturing Processes* 2013;28,6:650-656.
21. Bedeloglu A, Sunter N, Yildirim B, Bozkurt Y. Bending and Tensile Properties of Cotton/Metal Wire Complex Yarns Produced for Electromagnetic Shielding and Conductivity Applications. *Journal of the Textile Institute* 2012;103, 12: 1304-1311.
22. Schwarz A, Kazani I, Cuny L, Hertleer C, Ghekiere F, Clercq DG, Langenhove LV. Comparative Study On The Mechanical Properties Of Elastic, Electro-Conductive Hybrid Yarns and Their Input Materials. *Textile Research Journal* 2011;81,16:1713-1723.
23. Lou CW. Process of Complex Core Spun Yarn Containing a Metal Wire. *Textile Research Journal* 2005;75,6:466-473.
24. Örtlek HG. Developing of Innovative Core-Spun Yarns for Denim Fabrics. In "Proc. UTİB 5th International R&D Brokerage Event", Bursa, Turkey, 2013, pp.305-306, ISBN: 978-605-5919-05-4
25. ISO 139:2005. Textiles — Standard Atmospheres for Conditioning and Testing
26. ISO 2060:1994. Textiles -- Yarn from packages -- Determination of linear density (mass per unit length) by the skein method
27. ISO 2062:2009. Textiles - Yarns from packages - Determination of single-end breaking force and elongation at break using constant rate of extension (CRE) tester
28. Ghosh A, Patanaik A, Anandjiwala RD, Rengasamy RS. A Study on Dynamic Friction of Different Spun Yarns. *Journal of Applied Polymer Science* 2008;108:3233- 3238.

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INSTITUTE OF BIOPOLYMERS AND CHEMICAL FIBRES

LABORATORY OF BIODEGRADATION

The Laboratory of Biodegradation operates within the structure of the Institute of Biopolymers and Chemical Fibres. It is a modern laboratory with a certificate of accreditation according to Standard PN-EN/ISO/IEC-17025: 2005 (a quality system) bestowed by the Polish Accreditation Centre (PCA). The laboratory works at a global level and can cooperate with many institutions that produce, process and investigate polymeric materials. Thanks to its modern equipment, the Laboratory of Biodegradation can maintain cooperation with Polish and foreign research centers as well as manufacturers and be helpful in assessing the biodegradability of polymeric materials and textiles.

The Laboratory of Biodegradation assesses the susceptibility of polymeric and textile materials to biological degradation caused by microorganisms occurring in the natural environment (soil, compost and water medium). The testing of biodegradation is carried out in oxygen using innovative methods like respirometric testing with the continuous reading of the CO₂ delivered. The laboratory's modern MICRO-OXYMAX RESPIROMETER is used for carrying out tests in accordance with International Standards.



The methodology of biodegradability testing has been prepared on the basis of the following standards:

- **testing in aqueous medium:** 'Determination of the ultimate aerobic biodegradability of plastic materials and textiles in an aqueous medium. A method of analysing the carbon dioxide evolved' (PN-EN ISO 14 852: 2007, and PN-EN ISO 8192: 2007)
- **testing in compost medium:** 'Determination of the degree of disintegration of plastic materials and textiles under simulated composting conditions in a laboratory-scale test. A method of determining the weight loss' (PN-EN ISO 20 200: 2007, PN-EN ISO 14 045: 2005, and PN-EN ISO 14 806: 2010)
- **testing in soil medium:** 'Determination of the degree of disintegration of plastic materials and textiles under simulated soil conditions in a laboratory-scale test. A method of determining the weight loss' (PN-EN ISO 11 266: 1997, PN-EN ISO 11 721-1: 2002, and PN-EN ISO 11 721-2: 2002).



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The following methods are applied in the assessment of biodegradation: gel chromatography (GPC), infrared spectroscopy (IR), thermogravimetric analysis (TGA) and scanning electron microscopy (SEM).

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