POLISH NATIONAL AGENCY FOR ACADEMIC EXCHANGE

STER PROGRAMME

name of the unit:

INSTITUTE OF MATERIAL SCIENCE OF TEXTILES AND POLYMER COMPOSITES

Lodz University of Technology

symbol:

I-42

http://www.k48.p.lodz.pl

head of the unit:	potential promoters:	contact person:
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scope of activities:

The main areas of interest and research directions are the following issues falling within the general concept of Materials Science:

- research on the production of environmentally friendly polymer composites from waste materials, including textile,
- research on sound absorption of composites produced, among others based on materials obtained from renewable sources,
- modeling of sound-absorbing and mechanical properties and absorption of electromagnetic radiation by materials.

present activities:

We develop and manufacture composites on a polymer matrix (duro- and thermoplastic) with fibrous and non-fibrous reinforcement. We develop composites with natural reinforcement, such as cork, wood, straw, natural fibers, obtained from renewable sources. In addition, we develop composites based on "recycled" materials such as garnetted textiles on a pulping machine, recycled fibers from textile factories, waste paper. We develop and manufacture semi-finished products such as yarns, non-woven fabrics, foils. We carry out tests of composites as well as materials used to produce them. We conduct research on the structure of materials, sound-absorbing properties, determining the coefficient of sound absorption with a frequency of up to 6400Hz using an impedance pipe, thermal properties, absorption properties of electromagnetic radiation - research on the transmission of electromagnetic waves of super-high frequency, physical and mechanical properties.

graphic material

Future activities:

Development of current composite materials and creation of new ones, e.g. barrier materials based on garnetted textile materials obtained from waste.

Publications/patents, awards, projects:

Krucińska I., Gliścińska E., Michalak M., Ciechańska D., Kazimierczak J., Bloda A., "Sound-absorbing green composites based on cellulose ultra-short/ultra-fine fibers", Textile Research Journal, DOI: 10.1177/0040517514553873, Vol. 85(6)2015, 646-657.

Eulalia Gliscinska, Javier Perez de Amezaga, Marina Michalak, Izabella Krucinska Green sound-absorbing composite materials of various structure and profiling ,*Coatings* 2021, *11*, 407. https://doi.org/10.3390/coatings11040407

Krucińska I., Gliścińska E., Michalak M. „Sound-absorbing composite on a thermoplastic matrix and the method of production of this composite", no P. 409183

Patent application no. P. 429247 - „Sound-absorbing composite on a thermoplastic matrix and the method of production of this composite", Michalak M, Gliścińska E., Krucińska. I. - 2019 Patent application no P. 432284 - „Resonant sound-absorbing composite and how it is produced", Michalak M, Krucińska. I., Gliścińska E. - 2019 Łódzkie Eureka 2014 for Gold medal - Thermoplastic sound absorbing composite, I. Krucinska, E. Gliscinska, M. Michalak, D. Ciechanska, A. Bloda, J.Kazimierczak, E. Kopania, J. Wietecha.
Keywords: composites, sound absorption, absorption of electromagnetic radiation, re-fibres, renewable sources
List of internship proposal in this research team: Co-implementation of the production and testing of physical and mechanical properties of composite materials.