



FIT-4-NMP

Strategic and targeted support
to incentivise talented newcomers
to NMP projects under Horizon Europe

HIGH-PERFORMANCE and SUSTAINABLE COMPOSITES INNOVATION WORKSHOP TU DRESDEN 13-14.10.2022

Łukasiewicz Research Network
– Institute of Electrical Engineering
Poland



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 958255

KEY DIRECTIONS

- ❖ Electromobility and electric transport
- ❖ Electric power engineering
- ❖ Electrical engineering
- ❖ Material Engineering



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WE OFFER TESTING

We offer technical consulting as well as technological services. We have equipment that allows us to perform accredited tests, among others:- Electrical strength (dry lightning surge voltage test - Haefely 700 kV 35 kJ generator, AC mains frequency measurements dry as well as in the rain - high voltage transformer with rain chamber.- Mechanical strength (bending, tensile and compressive strength tests - testing machines (Louis Schopper, Instron), thermomechanical tests).- Determination of physical and chemical properties of ceramic materials (determination of volumetric (apparent) density and open porosity, bending strength test, determination of linear expansion coefficient (DL-3 dilatometer), test of resistance to sudden temperature changes, determination of conductivity and heat capacity, test of dielectric strength, verification of withstand voltage, measurement of dielectric loss factor and electrical permeability, and resistivity tests in the temperature range of 25 - 600 °C).



Electrical strength test
ceramic materials



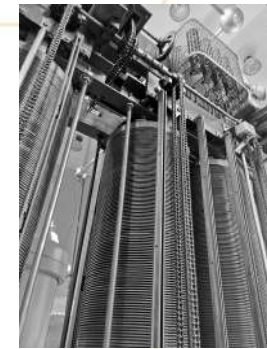
High-voltage tests
insulators - shocks



Testing of mechanical
strength on bending



Study of linear expansion
of electrical insulating materials



High-voltage tests
insulators - alternating voltage



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RESEARCH CAPABILITIES

- Phase composition studies - using diffractometry (XRD). Analyses are performed on a DRON+2 powder diffractometer by step registration with Fe-filtered Co radiation
- Microscopic (SEM) studies
- Thermoanalytical studies
- Flammability testing of electrical insulating materials, plastics, electrical wires, etc. - Testing of resistance to fire hazard by glow wire method, resistance to vertical flame spread - fire hazard by 1 kW compound flame, and testing of flammability category by 50 W test flame, with horizontal and vertical sample positioning
- Resistance of plastic samples to mold by methods A and B
- We perform thermal treatment of materials up to 1700 °C



Analytical balance



Flammability test by glowing wire



Tests for resistance to mildew



Thermoanalytical testing



Microscopic analyses

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LABORATORY SERVICES



1

Accredited labs

2

Non-accredited labs

3

Research laboratories



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HORIZON-CL4-2023-TWIN-TRANSITION-01-31:

ENERGY EFFICIENCY BREAKTHROUGHS IN THE PROCESS INDUSTRIES

(PROCESSES4PLANET PARTNERSHIP) (RIA)

HORIZON-CL4-2024-RESILIENCE-01-24:

DEVELOPMENT OF SAFE AND SUSTAINABLE BY DESIGN ALTERNATIVES (IA)

1. My key idea for contribution to a project under this topic

- The development of innovative systems using renewable energy sources together with the management system and its components, such as electric and hydrogen storage facilities, is one of the main issues carried out at the Insite

Or:

- testing of aging processes of polymers to determine their heat resistance, temperature indices and insulation grade
- high-temperature (up to 1100 C) TGA/DSC thermoanalysis of polymers
- testing of mechanical properties of polymer products,
- study of electrical properties of polymer products, such as resistance, electrical strength Polymer materials
- testing of varnishes and paints in liquid and cured state, - determination of performance parameters of electrical insulating varnishes and electrical insulating materials based on reactive resins and improvement of their mechanical and thermal properties,- testing the heat resistance of electro-technical materials (temperature indices).



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Lech Górecki, M.Sc., Faculty of Electrical Engineering, graduated from Wrocław University of Technology. Specialist in research of electrical insulating varnishes saturating, winding wires, insulating systems, electrical machines and equipment Conducts research of polymers:

- aging processes of polymers to determine their heat resistance, temperature indices and insulation grade
- High-temperature (up to 1100 C) TGA/DSC thermoanalysis of polymers
- testing of mechanical properties of polymer products,
- study of electrical properties of polymer products, such as resistance, electrical strength Polymer materials for use in voltage inverter insulation systems.

He has participated in a number of research projects, including the study of thermal stability of polymers by TGA method within the framework of the project "New polymer photovoltaic cells: study of the effect of polymer structure, architecture and type of dopants on the efficiency of polymer solar cells based on polyazomethines and polyopenes."

- Katarzyna Gryzłó M.Sc. Faculty of Chemistry, Wrocław University of Technology major - biotechnology specialty - Molecular biotechnology and biocatalysis Environmental Testing of Electrical Products- testing of varnishes and paints in liquid and cured state, - determination of performance parameters of electrical insulating varnishes and electrical insulating materials based on reactive resins and improvement of their mechanical and thermal properties,- testing the heat resistance of electro-technical materials (temperature indices) In 2014. - I was the head of the research and development work funded by the Institute of Electrical Engineering "Effect of electrokinetic properties of nanofiller on the stability of dispersion of nanoparticles in varnish composite" In 2015. - I was one of the contractors of the research project entitled. "Development of technology for the fabrication of polymer composites with antistatic, semiconductive and positronic properties for applications in low- and medium-power switches and high-voltage products" In 2017. - I was one of the contractors of the research and development work funded by the Ministry of Science and Higher Education "Supercatalysis" In 2017. - I was one of the contractors of the research and development project funded by the Ministry of Science and Higher Education "Research on the possibility of using fine fractions, waste from the processing of basalt aggregates in composite product manufacturing technologies"



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