



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

Technology Partners Foundation
Kamila Sałasińska
Poland



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

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



- Technology Partners Foundation (TPF) is a multidisciplinary Research and Technology Organisation (RTO), privately founded in 2003 as a non-profit entity.
- Our research activities focus on new materials design and improvement of manufacturing of the multifunctional composites and functional coatings.
- We also take part in activities which help talented newcomers, promising innovation organisations to increase their participation in NMP projects in Horizon Europe.
- We are active in RIA, IA and CSA EU Framework Programmes, as well as in European RTO associations, such as EARTO or K4I. We are a member of Composites Cluster in Poland.
- We commenced research activities in such topics as predictive maintenance of wind-turbines, and green ammonia manufacturing.
- TPF participated in 19 international cooperation projects (including: 11 H2020 + FP7 projects, 1 coordinated by TPF) with a total value of approx. EUR 150 million, created a technological spin-off, and participated in 11 projects directly commissioned and financed by international industry.



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KEY IDEA - CHARACTERIZATION AND PROCESSING OF ALTERNATIVES

BIOPLASTICS
ARE MADE FROM CORN



POLYMERS

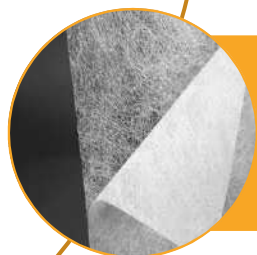
P. Latko-Duratek, K. Dydek, A. Boczkowska. *Journal of Polymers and the Environment*. Vol. 27. Issue 11. 2600-2606 (2019)
P. Latko-Duratek, K. Dydek, E. Golonko, Anna Boczkowska. *Fibres and Textiles in Eastern Europe*. 26(2), 61-65 (2018)

- ✓ Bioderivative/biodegradable polymers (PLA, PA11, EP)
- ✓ Recycled polymers as a matrix (rPET from the bottles)
- ✓ Any new developed by the partners



FILLERS

- ✓ Natural filler wastes from the agri-food industry
- ✓ Recycled short fibres (carbon/glass)
- ✓ Any new developed by the partners



SEMI-FINISHED PRODUCTS

- ✓ Pellets fabrication by twin-screw extrusion
- ✓ Filaments for 3D printing by single screw extrusion
- ✓ Nonwovens fabricated by a melt-blown process
- ✓ Fibres manufactured by a melt-spinning process



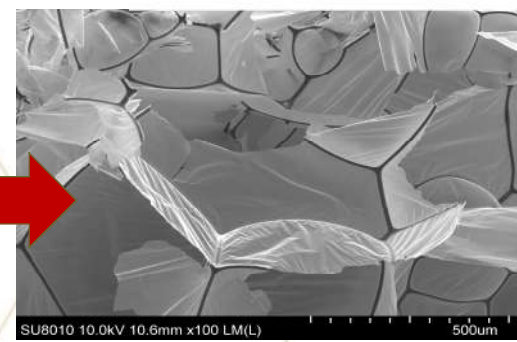
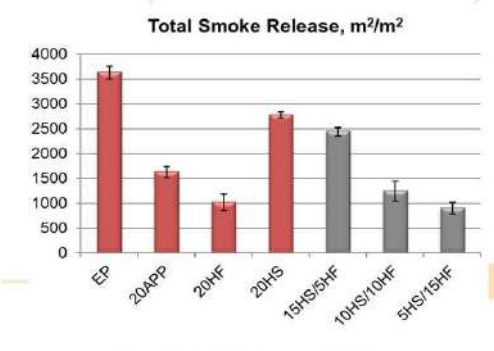
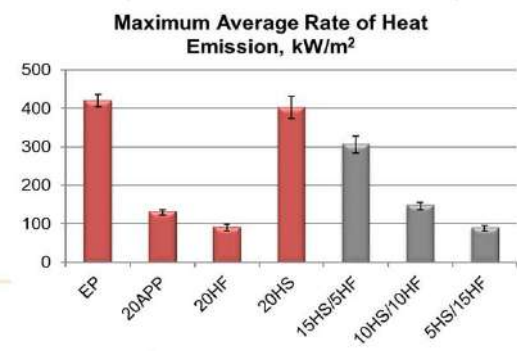
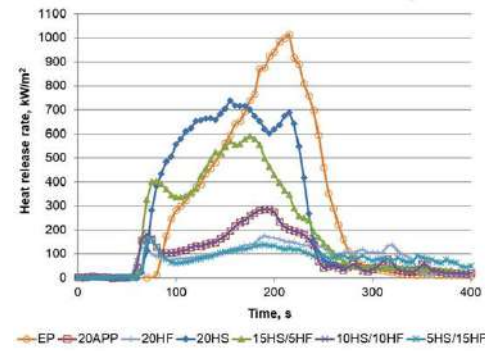
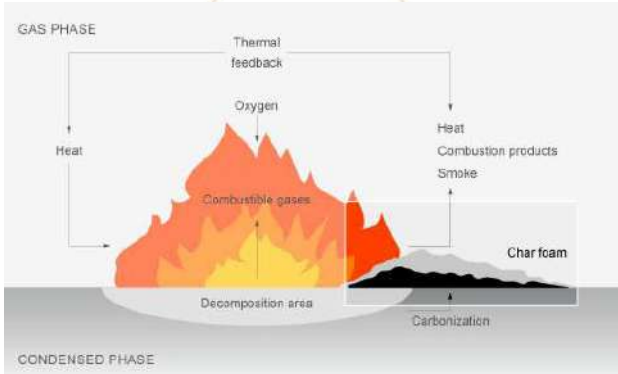
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HORIZON-CL4-2024-RESILIENCE-01-24: DEVELOPMENT OF SAFE AND SUSTAINABLE BY DESIGN ALTERNATIVES (IA)



KEY IDEA – FIRE RETARDANT SYSTEM

Salasinska K., Celiński M., Mizera K., Kozikowski P., Leszczyński M.K., Gajek A., Polymer Degradation and Stability 2020, 181, 109292, Salasinska K., Barczewski M., Borucka M., Górny R.L., Kozikowski P., Celiński M., Gajek A., Polymers 2019, 11, 1234



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COMPETENCES AND MOTIVATIONS

TECHNICAL COMPETENCES

- Production of CNT-doped veils by melt-blown
- 3D filaments manufacturing
- Processing of polymers with wide range of additives and fillers
- Twin screw extrusion compounding and dry strand pelletizing
- Flexibility. Quick material change. Small production batches

SCIENTIFIC COMPETENCES

- Leading research and higher education institute in Poland
- Extensive research facilities
- Researchers with a broad experience in R&D projects
- Cooperation with many others institutions and industry

MOTIVATIONS

- Expanding the products offer
- Extending the product' areas applications
- Getting fundings for innovations

MOTIVATIONS

- Testing the developed materials in the industrial conditions
- Working in the international environment
- Searching the new cooperations





RELEVANT EXPERIENCES

PROJECTS

- OASIS**- Horizon 2020 - An ecosystem of 12 nanotechnology manufacturing pilot lines, providing nanomaterials, nano-intermediates, nano-enabled products and services for development and commercialization of lightweight multifunctional products based on aluminium and polymer composites.
- PLATFORM**- Horizon 2020 - Open access pilot plants for sustainable industrial scale nanocomposites manufacturing based on buckypapers, doped veils and preregs.
- BIOMASA** - NCBiR, Polymer composites with biomass.
- III.P.07** - MNiSW/NCBiR, New intumescent flame retardants systems and polymers containing them.
- GEKON** - NCBiR, Development of the technology for a recovery and recycling of post-consumer material based on PETG foil contaminated with colorful print.
- LITAPROP** - Light-weight composite structure with tailored mechanical, thermal and electrical properties.

PATENTS

- EP 2 987 822 B1 - A method for recovering polymer from printed PETG substrates
- 221848 - A method of producing thermoplastic fibers and nonwovens with carbon nanotubes
- P.431669 - Method for obtaining epoxy resins with reduced smoke emission and a two-component flame-retardant composition for obtaining epoxy resins with reduced smoke emission
- 238541 - A composition of substances that reduce the smoke emission of polymers during the smoking process



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HORIZON-CL4-2024-RESILIENCE-01-24: DEVELOPMENT OF SAFE AND SUSTAINABLE BY DESIGN ALTERNATIVES (IA) RELEVANT EQUIPMENT/FACILITIES



INDUSTRIAL SCALE

- Continuous melt-blown extrusion line for 300mm tape
- Cyclic melt-blown extrusion line for 600 x 900mm fabric
- Compounding line connected with dry strand pelletizer
- Filaments production line
- Liquid resin infusion station 800 x 1500 mm
- Auxiliary equipment: low-speed roller granulator, vacuum oven, compressed air polymer dryer
- Moisture analyzer RADWAG Ma 50/1.X2.IC.A
- The Keithley 6517B Electrometer, 8009 Resistivity Test Fixture and KickStart Software

LABORATORY SCALE

- Laboratories for the polymer processing and composites fabrication (twin screw extruder, injection molding machine, mixers, three roll mill, ultrasonic guns, vacuum dryers, etc)
- Equipment for flammability analysis
- Equipment for thermal and thermo-mechanical analysis
- Equipment for microstructure analysis
- Equipment for rheological properties analysis
- Equipment for mechanical properties analysis
- Other: 3D FDM printer, ultramicrotomes, climatic and salt chambers with UV lamps, nanovoltmeter, FTIR ATR spectrometer, density test)



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