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Science:

- Analysis and modification of technology of wood-based composites
- Expertises in the range of wood-based composites (technology, products etc.)
- Development of new wood-based composites
- Circular economy development in wood-based composites technology
- Biopolymers, regenerated cellulose, nanoparticles

Teaching:

- Adhesive bonding
- Basis of wood based panels technology I
- Basis of wood based panels technology II
- Technology of wood based panels
- Wood based panels in furniture
- Special purpose wood based panels
- Finishing of wood and wood based panels
- Information technologies
- Wood waste management
- Thesis

Education:

- 2001 – 2006 Ph.D. studies on Faculty of Wood Technology, Agricultural University of Poznan, including 8 weeks as a visiting researcher on BOKU, Vienna, AT
- 1996-2001: stationary studies on Faculty of Wood Technology, Agricultural University of Poznan; mechanical technology of wood

Employment:

- from 2011 Warsaw University of Life Sciences - SGGW, Department of Technology and Entrepreneurship in Wood Industry. Assistant professor

- 2010 – 2011 Wood Technology Institute, Poznan; Certification Centre of Wood Industry Products. Assistant professor, auditor of factory production control for California Air Resources Board (CARB) certification purposes
- 2006 – 2010 Wood Technology Institute, Poznan; Wood-Based Materials and Glues Department. Assistant professor (v-ce head of Department)
- 2002 Faculty of Wood Technology, Agricultural University of Poznan. Assistant

International cooperation:

- Manager and main executor of the research project titled „Elaboration of Layered Lignocellulosic Composites With New BioBased Adhesives”, financed by Polish National Agency for Academic Exchange under the call PHC Polonium (Poland - France), 2021 - 2022
- COST Action FP1407 Management Committee member: Understanding wood modification through an integrated scientific and environmental impact approach (ModWoodLife), 2014 - 2018
- COST Action FP1303 Management Committee substitute member: Performance of bio-based building materials, 2013 - 2017
- COST Action FP1205 Management Committee member: Innovative applications of regenerated wood cellulose fibres, 2013 - 2017
- COST Action FP1105 Management Committee member: Understanding wood cell wall structure, biopolymer interaction and composition: implications for current products and new material innovation, 2012 - 2016
- COST Action E35 Management Committee member: Fracture mechanics and micromechanics of wood and wood composites with regard to wood machining, 2004 – 2008
- Visiting Researcher in IVALSA CNR (Istituto per la Valorizzazione del Legno e delle Specie Arboree del Consiglio Nazionale delle Ricerche), San Michele all’Adige, Italy, 10 weeks, 2008
- Executor of bilateral Austria - Poland scientific project - Christian-Doppler-Laboratorium Grundlagen der Holzbearbeitung, BOKU Austria Faculty of Wood Technology, Agricultural University of Poznan, 2002-2003

Selected publications:

- Gumowska A., Kowaluk G.: Physical and Mechanical Properties of High-Density Fiberboard Bonded with Bio-Based Adhesives, *Forests*, Multidisciplinary Digital Publishing Institute (MDPI), vol. 14, no. 1, 2023, Article number: 84, pp. 1-16, DOI:10.3390/f14010084
- Ježo A., Wronka A., Dębiński A., Kristak L., Reh R., Rizhikovs J., Kowaluk G.: Influence of Upcycled Post-Treatment Bark Biomass Addition to the Binder on Produced Plywood Properties, *Forests*, Multidisciplinary Digital Publishing Institute (MDPI), vol. 14, no. 1, 2023, Article number: 110, pp. 1-14, DOI:10.3390/f14010110
- Suchorab B., Wronka A., Kowaluk G.: Towards circular economy by valorization of waste upholstery textile fibers in fibrous wood-based composites production, *European Journal of Wood and Wood Products (HOLZ ALS ROH-UND WERKSTOFF)*, Springer, vol. 81, 2023, pp. 1-7, DOI:10.1007/s00107-023-01929-4
- Gumowska A., Robles E., Bikoro A., Wronka A., Kowaluk G.: Selected Properties of Bio-Based Layered Hybrid Composites with Biopolymer Blends for Structural

Applications, Polymers, MDPI , vol. 14, no. 20, 2022, Article number: 4393, pp. 1-15, DOI:10.3390/polym14204393

- Wronka A., Beer P., Kowaluk G.: Selected Properties of Single and Multi-Layered Particleboards with the Structure Modified by Fibers Implication, Materials, MDPIAG, vol. 15, no. 23, 2022, Article number: 8530, pp. 1-16, DOI:10.3390/ma15238530
- Wronka A., Kowaluk G.: The Influence of Multiple Mechanical Recycling of Particleboards on Their Selected Mechanical and Physical Properties, Materials, MDPIAG, vol. 15, no. 23, 2022, Article number: 8487, pp. 1-18, DOI:10.3390/ma15238487
- Wronka A., Kowaluk G.: Upcycling Different Particle Sizes and Contents of Pine Branches into Particleboard, Polymers, MDPI , vol. 14, no. 21, 2022, Article number: 4559, pp. 1-12, DOI:10.3390/polym14214559
- Wronka A., Robles E., Kowaluk G. (2021): Upcycling and Recycling Potential of Selected Lignocellulosic Waste Biomass. Materials 2021, 14(24), 7772; <https://doi.org/10.3390/ma14247772>
- Gumowska A., Robles E., Kowaluk G. (2021): Evaluation of Functional Features of Lignocellulosic Particle Composites Containing Biopolymer Binders. Materials 2021, 14(24), 7718; <https://doi.org/10.3390/ma14247718>
- Sala C.M., Robles E., Kowaluk G. (2020): Influence of the Addition of Spruce Fibers to Industrial-Type High-Density Fiberboards Produced with Recycled Fibers. Waste and Biomass Valorization, (), 1-10; <https://doi:10.1007/s12649-020-01250-8>
- Sala C.M., Robles E., Kowaluk G. (2020): Influence of Adding Offcuts and Trims with a Recycling Approach on the Properties of High-Density Fibrous Composites. Polymers 2020, 12, 1327; <https://doi:10.3390/polym12061327>
- Auriga R., Gumowska A., Szymanowski K., Wronka A., Robles E., Ocipka P., Kowaluk G. (2020): Performance properties of plywood composites reinforced with carbon fibers. Composite Structures, vol. 248, 112533; <https://doi.org/10.1016/j.compstruct.2020.112533>
- Sala C. M., Robles E., Gumowska A., Wronka A., Kowaluk G. (2020): Influence of Moisture Content on the Mechanical Properties of Selected Wood-based Composites. BioResources 15(3), 5503-5513; <https://doi.org/10.15376/biores.15.3.5503-5513>
- Borysiuk P., Burawska-Kupniewska I., Auriga R., Kowaluk G., Kozakiewicz P., Zbieć M. (2019): Influence of Layered Structure of Composite Timber Floor Boards on Their Hardness Drvna Industrija, Vol. 70 No. 4, 2019; p. 399-406; <https://doi.org/10.5552/drvind.2019.1856>
- Gumowska A., Kowaluk G., Labidi J., Robles E. (2019): Barrier properties of cellulose nanofibers film as an external layer of particleboard. Clean Technologies and Environmental Policy; <https://doi.org/10.1007/s10098-019-01760-7>
- Kowaluk G., Szymanowski K., Kozłowski P., Kukuła W., Sala C., Robles E., Czarniak P. (2019): Functional Assessment of Particleboards Made of Apple and Plum Orchard Pruning Waste and Biomass Valorization, 1 - 10, <https://doi.org/10.1007/s12649-018-00568-8>
- Gumowska A., Wronka A., Borysiuk P., Robles E., Sala C., Kowaluk G. (2018): Production of layered wood composites with a time-saving layer-by-layer addition BioResources 13(4), 8089-8099
- Robles E., Czubak E., Kowaluk G., Labidi J. (2016): Lignocellulosic-based multilayer self-bonded composites with modified cellulose nanoparticles Composites Part B: Engineering – <http://dx.doi.org/10.1016/j.compositesb.2016.09.049>

- Kowaluk G., Zając M., Czubak E., Auriga R. (2016): Physical and mechanical properties of particleboards manufactured using charcoal as additives iForest (early view). – doi:10.3832/ifor1963-009 [online 2016-06-29]
- Kowaluk G. (2014): Properties of lignocellulosics composites containing regenerated cellulose fibers BioResources 9(3), 5339-5348
- Archanowicz E., Kowaluk G., Niedzinski W., Beer P. (2013): Properties of particleboards made of biocomponents from fibrous chips for FEM modeling. BioResources 8(4), 6220-6230
- Kowaluk G., Borysiuk P., Boruszewski P., Mamiński M., Fuczek D. (2013): Particleboards engineered through separate layer bonding. Wood Research 58(2): 265-274
- Chapter titled “Machining of Wood and Wood Composites” in monography Wood Machining for ISTE Wiley Publ. Ltd, 2012
- Chapter titled “Machining processes for wood-based composite materials” in monography Machining Technology of Composite Materials: Principles and Practice for Woodhead Publishing Ltd, 2011
- Kowaluk G. (2011): Influence of particles fraction used for surface layer on particleboard strength. Annals of Warsaw University of Life Sciences - SGGW. Forestry and Wood Technology, nr 74, 212-215
- Kowaluk, G., Fuczek, D., Beer, P., Grzeńkiewicz, M. (2011): Influence of the raw materials and production parameters on chosen standard properties for furniture panels of biocomposites from fibrous chips. BioResources 6(3), 3004-3018
- Kowaluk G., Komorowicz M., Witczak M., Fuczek D. (2011): Formaldehyde content and VOC release from particleboards made out from fibrous chips. DREWNO – WOOD 2011, nr 185
- Kowaluk G., Fuczek D. (2010): Screw holding performance of panels made out from fibrous chips. DREWNO – WOOD 2010, vol. 53, nr 184; 77-81
- Kot M., Kowaluk G. (2010): Wood hydrophobization by ammonium ionic liquids. DREWNO – WOOD 2010, vol. 53, nr 184; 39-44
- Irle M., Kowaluk G. (2009): COST E49: processes and performance of wood-based panels – the action summary and final conference. DREWNO – WOOD 2009, vol. 52, nr 182; 139-141
- Negri M., Sandak M., Kowaluk G., Pałubicki B. (2009): Form and mass changes of composite panels under variable environment humidity. DREWNO – WOOD 2009, vol. 52, nr 182; 7-15
- Kowaluk G., Fuczek D. (2009): PVAc glue as a binding agent in particleboards. DREWNO – WOOD 2009, vol. 52, nr 182; 17-24
- Kowaluk G., Pałubicki B., Frąckowiak I., Marchal R., Beer P. (2009): Influence of ligno-cellulosic particles on tribological properties of boards. European Journal of Wood and Wood Products, Springer, 28.07.2009, vol. 68, no. 1; 95-98
- Kowaluk G., Szymański W., Pałubicki B., Beer P. (2009): Examination of tools of different materials edge geometry for MDF milling. Eur. J. Wood Prod. 67: 173-176
- Łacki W., Beer P., Kowaluk G., Szymański W. (2009): Application of neuron networks for the prognostication of the processing quality of laminated particleboards. Wood Research 54 (3): 89-98
- Pałubicki B., Marchal R., Butaud J.-C., Denaud L.-E., Bléron L., Collet R., Kowaluk G. (2009): A Method of Lathe Checks Measurement; SMOF device and its software. Eur. J Wood Prod. DOI 10.1007/s00107-009-0360-y

Research projects (ongoing):

- Manager of the project entitled "Research on thermally active wood-based composites for furniture and interior design" as part of the MEiN call "Student scientific teams create innovations"; 2023-2024
- Manager and main executor of the research project titled "Tree bark as a renewable source of wood protection materials for building applications; ForestValue Call 2021; 2022 – 2025
- Manager and main executor of the research project titled "Sustainable production of Cellulose-based products and additives to be used in SMEs and rural areas"; call H2020-MSCA-RISE-2020; 2021 – 2025

Admitted patents:

Kowaluk G., Gumowska A. (2019): A method of pressing layered materials, especially lignocellulosic

Actualisation – May 2023