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Sustainable utilization of tire textile waste for the production of high-quality thermal insulation mats for building industry

Abstract:

Waste tire textile fiber is a byproduct of the processing of end-of-life tires. It is commonly disposed of through incineration or landfilling-both of which present significant environmental hazards. However, having a fibrous structure, waste tire textile can find potential applications in the production of thermal insulation materials. It has been discovered that 80% of waste tire textile fiber is utilized in the manufacturing of thermal insulation mats using non-woven technology. The remaining 20% of the raw material was strategically used for twining, stabilizing, and enhancing the mats' properties, and this portion comprised of bicomponent polyester fiber, recycled polyester fiber and hollow polyester fiber. Studies on these mats have shown that their thermal conductivity ranges from 0.0338 W/(m·K) to 0.0412 W/(m·K). The tensile strength, measured parallel to the direction of formation, varies from 5.60 kPa to 13.8 kPa, while the strength measured perpendicular to the forming direction ranges from 7.0 kPa to 23 kPa. Additionally, both the fibers and the finished product exhibit low water absorption values, which depend on the composition and range from 1.5% to 4.3%, as well as higher water contact angles.

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Biography

Agne Kairyte has completed her PhD at the age of 29 years from Vilnius Gediminas Technical University in the field of Materials Engineering. She has published more than 60 papers in reputed journals and participated in international and national conferences.