

Research project and supervisor team

Supervisory Team	Prof. Nick Miles Dr. Philip Hall Dr. Zheng Wang
Short introduction & description of research project	<p>As a kind of lightweight and sustainable material, wood-plastic composites (WPC) have gradually replaced some traditional wood products, and are now widely used in building, sports equipment and marine components. In industry, there is a trend to utilize recycled plastics for WPC products. However, the studies of the recycled plastics in WPC are very limited. The effects of recycled plastics in WPC require further investigation. Moreover, the applicable field of WPC is limited by several properties, such as: water absorption, thickness swell, flammability, fibre dispersion, interfacial adhesion between wood and plastic matrix. Although there are various reinforcement techniques have been reported in the literature, very few of them have been applied in industry. Apart from the economic factors, the knowledge gap between the key factors influencing the WPC performance in lab-scale and industrial-scale production still exists. This project will work closely with an industrial partner and aims to achieve three goals: 1) set up a recycled plastic selection standard based on the WPC processing and quality performance; 2) develop surface treatment methods and expand alternative wood flour/fibres; 3) improve the processing parameters and formula design to overcome the disadvantages of WPC. This project will include both the lab-scale and industrial scale production of WPC. The lab-scale production will help to analyse the key factors influencing the performance of wood flour/fibre and recycled plastics in WPC products. The industrial-scale production will show the influential factors which have been ignored and fulfil the knowledge gap between academic study and industrial trial. The project team leader has more than 10-year research experience on plastic recycling and utilization. The project lab equipped series of processing equipment fit with industrial use, and high-quality analytical instruments for properties characterization.</p>
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