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Abstract	:	A previous study demonstrated that incorporating kenaf, a natural fibre celebrated for its sustainability, at 15 wt% and wollastonite, a mineral filler, at 5 wt% into a polypropylene (PP) matrix resulted in the highest tensile properties among various hybrid composite formulations. This study explores the influence of kenaf fibre size (< 300 µm, 300–599 µm, and 600–849 µm) on the performance of these hybrid composites. Mechanical tests (tensile, flexural, and impact resistance), thermal analyses (DSC and TGA), and physical evaluations (density and water absorption) were performed. The results reveal that fibre size has a significant impact on composite performance. Smaller fibres improved tensile properties and flexural strength due to better dispersion and stronger fibre-matrix interactions. Medium-sized fibres demonstrated the highest impact strength (3.206 kJ/m²), whereas composites with larger fibres exhibited increased moisture absorption (2.5%). Physical properties, such as density, remained consistent across all samples (0.953–0.955 g/cm³). Thermal stability analyses through TGA and DSC showed minimal variation among fibre sizes, indicating comparable resistance to thermal degradation. These findings suggest that optimizing fibre size, particularly using smaller kenaf fibres, can enhance mechanical performance and water resistance without compromising thermal stability. The study highlights the potential of kenaf/wollastonite-PP composites in sustainable applications, particularly in the automotive and construction industries, offering valuable insights for the design and optimization of bio-based materials.