



Improving the Processing of NR/EBC Thermoplastic Vulcanizates Using a Full Design of Experiments (DOE) Approach

This study focuses on improving the processing of thermoplastic vulcanizates (TPVs) made from a blend of natural rubber (NR) and ethylene–butene copolymer (EBC). A full factorial design of experiments (DOE) was employed to optimize processing factors, including blend ratio, temperature, mixing speed, and mixing time. Mechanical properties, including strength, flexibility, hardness, and resistance to tearing and compression, were evaluated. Statistical analysis (ANOVA) was performed to identify the best processing conditions. The optimized TPVs demonstrated improved stiffness, flexibility, and energy absorption, rendering them suitable for high-performance applications. This study indicates that careful control of processing parameters can significantly enhance TPV performance, underscoring the effectiveness of the DOE method in material development.

The associated SDG goal is Responsible consumption and production (12).

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Reference:

Phupewkeaw, N., Sae-Oui, P., and **Sirisinha, C.**, Optimizing Processing parameters for NR/EBC thermoplastic vulcanizates: a comprehensive full factorial design of experiments (DOE) strategy, *Polymers* 2024, 16, 1963.

