Material Selection for Footwear Insole Using Analytical Hierarchal Process

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Abstract: Product performance depends on the type and quality of its building material. Successful product must be made using high-quality material, and using the right methods. The selection of appropriate material of footwear insole can help of reducing the occurrence of foot problems such as plantar ulceration or heel-strike impact. In this study, the analytical hierarchy process (AHP) is used to provide a systematic procedure for choosing the best material adequate for this application among three material alternatives (polyurethane, poron, and plastazote). Several comparison criteria are used to build the AHP model including density, stiffness, durability, energy absorption, and ease of fabrication. Poron was selected as the best choice. Inconsistency testing indicates that the model is reasonable, and the materials alternative ranking is effective.