Analysis of the Thermal Behavior of Materials for Orthopedic Heels

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Abstract.
Orthopedic heels are used by persons experiencing flat foot, complex static foot or secondary flat foot following fractures or degenerative diseases but also by persons who wish to acquire a better comfort of their feet because the nature of their activity requires mostly an orthostatic position. Interactive modules of the dedicated software (Freestep) allow the creation of personalized configurations so that the analysis tool is perfectly adaptable to the individual's needs.
The 3D model is then manufactured using ethylene-vinyl acetyl, also known as EVA, a copolymer made of ethylene and vinyl acetyl, which is very flexible and light weighted, also impermeable and UV and shock resistant.
The present paper proposes an experiment meant to determine the change of dimensions that may occur due to the increase of temperature of the orthopedic heels. 5 of the most used materials were analyzed during the experiment Orange Support, Blue Comfort, Multicolor, Green Relax, and Yellow Soft. Dimensions measurements were taken also 5 times a day for 5 days and recorded in tables and diagrams using Excel tools.
In order to perform a statistical analysis of the results, the F-Anova test was used and applied upon the recorded values. The conclusion was that there is a significant change of dimensions in the orthopedic heels materials that might affect the comfort of the users in certain conditions.