

## Ergonomic Analysis of Kleen-TeX Floormats

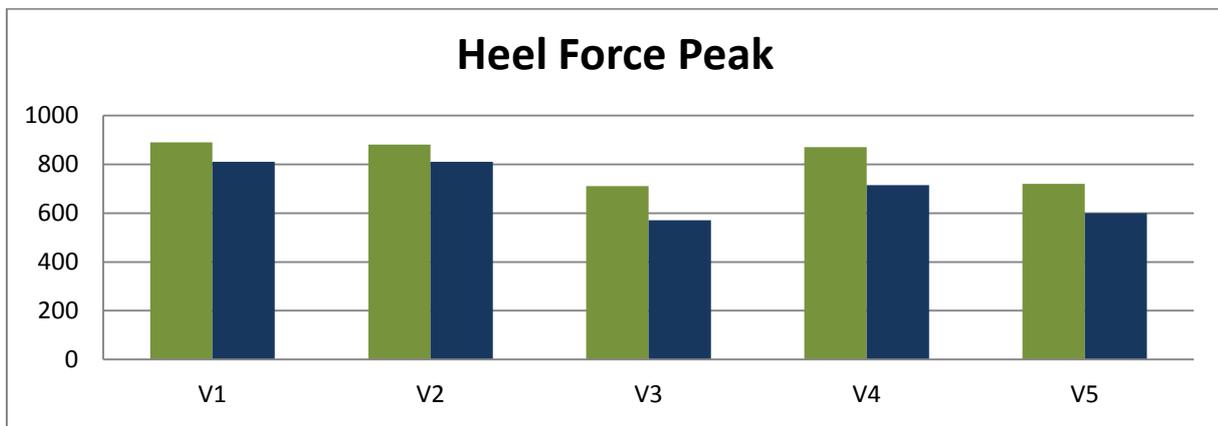
(6.4.2016, IfaErg – Bernhard Kurz)

In a feasibility study with a limited number of subjects, different floor mats manufactured by KleenTex - Austria were analyzed and evaluated with respect to ergonomic characteristics. Particular attention was paid to the **Kleen Komfort Safety** mat, a noticeably thicker mat, which was found to be more comfortable and by some users also less tiring when standing and walking on the mat compared to the situation without the mat. By using objective methods and measurements, such as elasticity characteristics, pressure measurements in shoes, force measurements on the ground as well as EMG, biomechanical effects were quantified. These effects were compared to the subjective evaluation of the participants with the help of structured questionnaires.

The results of the systematic analysis potentially show some conclusive evidence. There are positive hints, i.e., the mats are shock absorbing and it seems that there might be a promoting effect with a higher muscle activity in the legs with the **Kleen-Komfort Safety** mat. By comparing the results of the subjective analysis for two selected office workers during a period of 13-days with and without the **Kleen-Komfort Safety** mat, the perception of the users seems to correlate with the measurements and the positive effects are likely to be true.

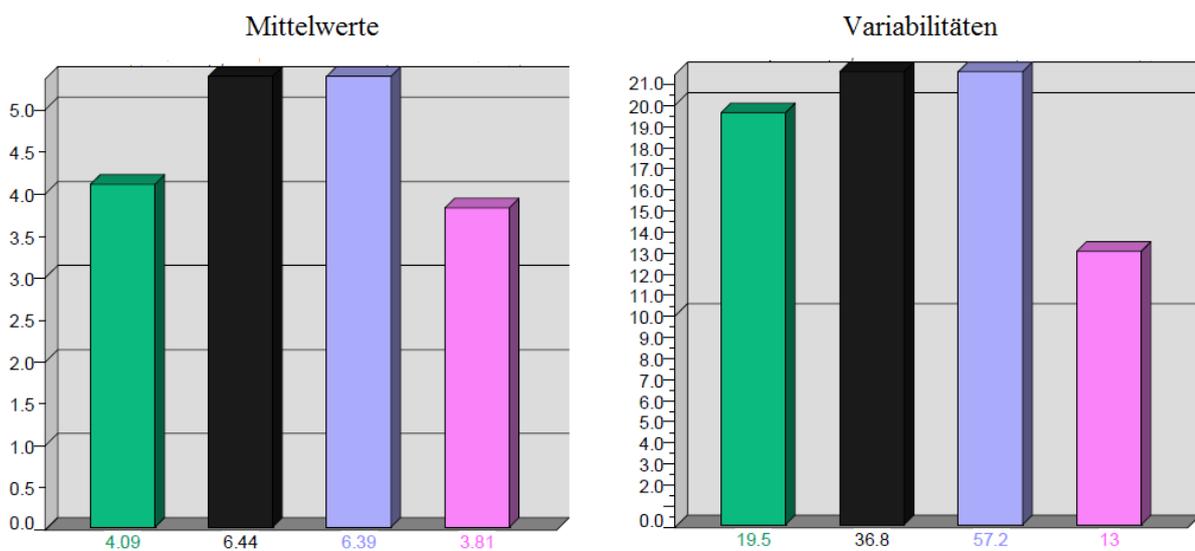
Despite the initial manifestation of brief paraesthesia (i.e. initially there was a reduction of sensitivity in the toes) the results, nevertheless, show improvements in the areas of the body back, knees and feet over the longer term. With the present survey results, the participants did not perceive a faster fatigue due to the increased muscle activity and no pertinent negative perceptions were expressed. Whether a better blood circulation is involved or if the calf volume is effected cannot be quantified yet. Only by the corresponding volume determination of the lower extremity and with a larger collective of participants could those effects be analyzed later on. Even without the statistical evaluation of the subjectively and objectively assessed situation, a positive influence with the **Kleen-Komfort Safety** mat could be considered. That might yield an increased well-being and higher willingness to work of the personnel.

Selected Results

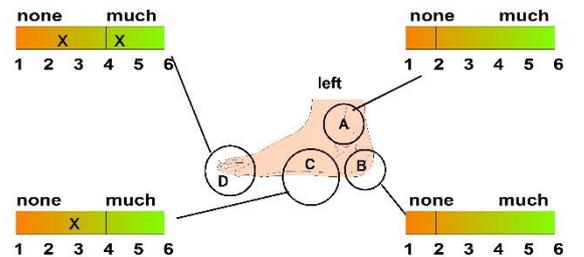
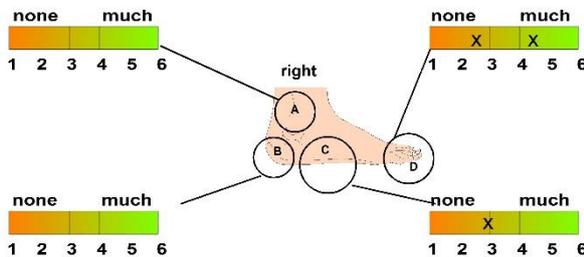
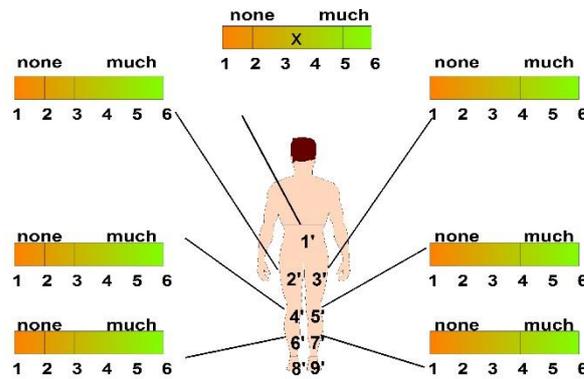
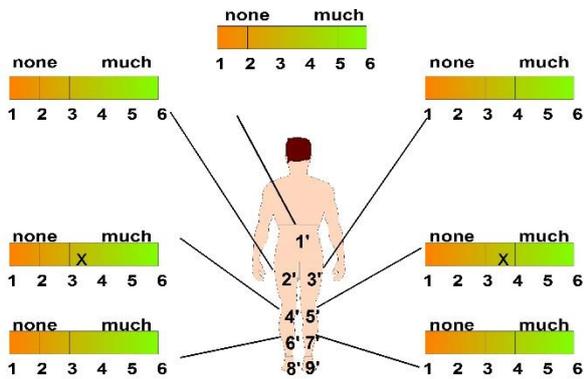
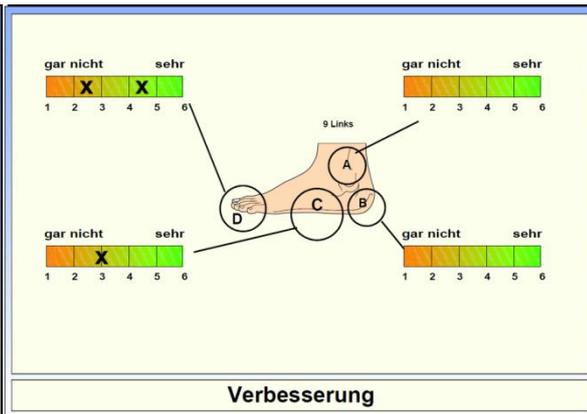
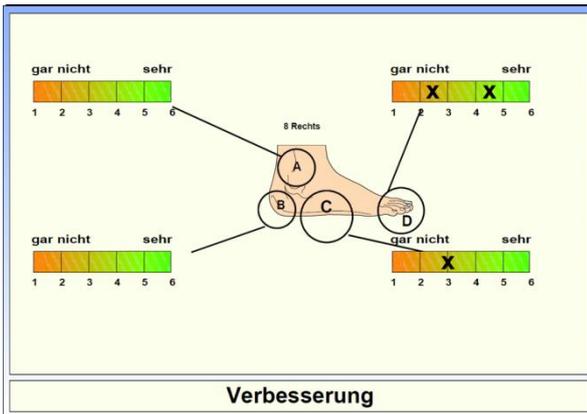
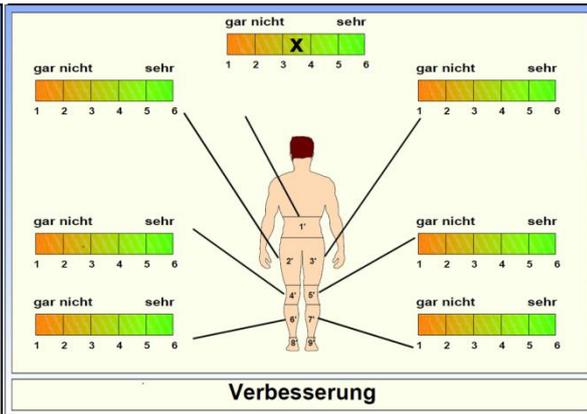
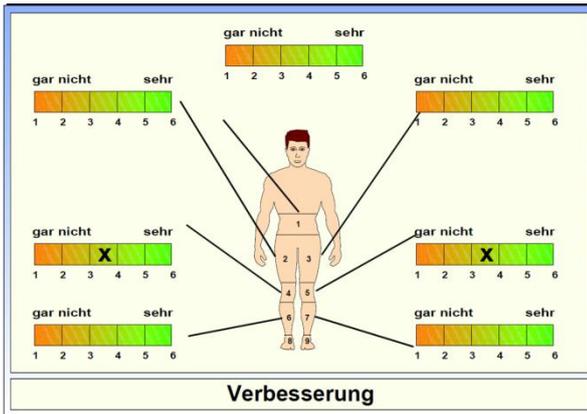


Heel Force Peaks in Newton with different test settings (V1 to V5) on hard ground (green) as well as on the **Kleen-Komfort Safety Mat** (blue)

Versuchsperson 1, gastrocnemius medialis, #M0: grün, rosa, #M1: schwarz, blau



Calf Muscle -EMG in a standing position of the participant on hard ground (green, pink) as well as on the **Kleen-Komfort Safety Mat** (black, blue) with higher muscle activation



**Improvement**

Selected results of the survey of the subjective analysis of the positive influence of the **Kleen-Komfort Safety Mat**: each cross shows the improvement the participant perceived