

## Assessment of the doctoral (PhD) thesis

### The reduction of high plantar pressures on diabetic's feet by special footwear walking on inclined plane

by

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The study is an example of multidisciplinary access to the problem formulated in the heading. Engineering viewpoint on the anatomical and physiological structure which the human body is, represents a specific situation intended by the specific problem to solve. Especially in the situation of pathology – diabetes mellitus, diabetic foot, internal and environmental factors affecting body functioning.

The study under consideration is a detailed investigation of a specific ergonomic problem. While ergonomics deals with the questions of optimization the relations of the existence and activities of human being within the context of environmental conditions, does this thesis study narrower problem how to optimize the living of people suffering by diabetes – first of all from the viewpoint of wearing shoes. Diabetic foot is namely one of important complications of the diabetes as a disease. In this point of the construction of adequate shoes meet medicine and clinics of this disease with the engineering activities in one part of shoe industry. Solving of this industrial problem contributes thus to the solution of another problem in medicine – to support the quality of life for the people suffering from diabetes.

Doctoral thesis of Ing. Zedbazar consists of literary part and the empirical one.

While the first part deals with the known knowledge concerning the diabetic foot, its pathology and complications arising thus for the ill subjects, the content of the 2nd one are the observations and measurements of some variables – parameters able to refer to the physiology and pathology as well of the foot, in an objective way. In the changes of the values of these parameters the problems of the diabetic subjects are projected and manifested. In this role ball girth, instep girth and heel girth are engaged.

The analysis of her data Ing. Zedbazar focuses on the correlation and regression evaluation, and the comparison of the respective results as found in two groups of subjects – young adults on the one side and older adults suffering from diabetes on the other one. The difference proved to be not only statistically significant, but also significant as the nominal differences is concerned. Object of comparison were not only parametric values immediately, but also the regression lines which express the relation existing between particular variables under consideration.

The results of statistical analysis are well demonstrated in the diagrams and figures. The author thus demonstrated, among others, her ability to utilize computer techniques and software (SPSS statistical package has been mentioned).

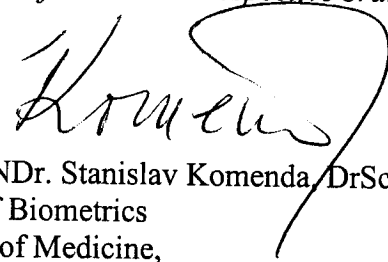
Additional information is presented as deduced from the questionnaires administered within the subjects under investigation. Particular items of the questionnaire concerned also the types of shoes and materials used by the interviewed respondents in their daily use, as well as their strategy when purchasing shoes – from the viewpoint of the diabetes, particularly the

risks of arising of diabetic foot, its prevention and the respective therapy of the problems still existing.

Plantar pressure measurement is the main object of the study, in this doctoral thesis. It is due to the fact that the pattern of the pressure distribution over the plantar surface may be the main reason of the pathology – the occurrence of diabetic foot as accompanied by all clinical manifestations, potentially leading to the possible ulceration and amputational surgical treatment as the final step. Recommendations the author presents should minimize the risks of the occurrence of diabetic foot; that's the way how the engineering know-how may serve for the protection of one group of people threatened by one of the most dangerous civilization diseases.

To summarize, I would like to express my opinion as the person accredited by the Dean of the Faculty of Technology, Tomas Bata University in Zlín, that the author of this Doctoral thesis, Ing. Enkhjargal Zedbazar, fulfilled the requirements set on the studies of this kind – so that I should *recommend to award her the doctoral diploma of PhD in the respective branch of science.*

In the town of Olomouc, June the 2<sup>nd</sup>, 2008



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