

## **Abstract**

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Title of thesis: Development of a new model for the evaluation of compression phase of compaction process

By evaluating the compression process during the preparation of tablets, we can find out information about the pressed material. This information is useful for the materials and tableting mixtures comparison, but also for predicting of potential problems during manufacturing. The theoretical part of this thesis is focused on the description of the methods most commonly used for the evaluation of pharmaceutical substances. Furthermore, there is a derivation of a new mathematical model for the evaluation of the compression phase of the compaction process and the corresponding script for the mathematical-statistical program QCExpert.

In the experimental part of the thesis, this new proposed model is used for the evaluation of two known and frequently used fillers. Lactose and microcrystalline cellulose are used as model fillers. These are compressed separately and in a mixture. The results of this evaluation are compared with the force-displacement record and the stress relaxation. The results of the work showed that the new model is applicable for evaluation of used substances. Very good correlations were observed among some parameters of the new model and the force-displacement record and stress relaxation. However, for some parameters, non-linear or no correlations were observed. In order to confirm the real usability, this method will have to be tested on a larger set of substances and mixtures.