

## **Abstract**

Charles University, Faculty of Pharmacy in Hradec Králové

Department od:                   Pharmaceutical Technology

Consultant:                       PharmDr. Petra Svačinová, Ph.D.

Student:                          Tereza Paris

Title of Thesis:                   Evaluation of compressibility of granular powders and  
tableting mixtures with the high content of active substance

This thesis deals with the evaluation of compressibility of granular powder and tableting mixtures with high drug content. Eleven batches of tablet formulations with different type of filler – microcrystalline cellulose or lactose and different type of extragranular disintegrants – sodium croscarmellose or crospovidone in concentrations of 2 %, 3,7 % or 5,4 % and two granular powders with only different type of filler were prepared by two methods. The first method was used to prepare tablets with the same height and the second method to prepare tablets with the same porosity as the oval tablets made from identical tableting mixtures. The compressibility was evaluated using the force-displacement method parameters and volumetric elastic recovery. Another tested parameter was tensile strength and, for one group of tablets, also porosity.

The obtained results show that both, the type of filler and the type of extragranular disintegrant, had an effect on the force-displacement method parameters especially at higher compression force. For the volumetric elastic recovery, the influence of the type of disintegrant was the most significant. The presence of croscarmellose had only a moderate effect on the elastic recovery, independently of the concentration present. The highest concentration of crospovidone increased the elastic recovery of the tablets most significantly, which was also reflected in the highest porosity and the lowest tensile strength of these tablets. The tensile strength of tablets was also affected by the type of filler. Tablets with lactose had higher tensile strength. The effect of croscarmellose concentration was not confirmed. The porosity of the tablets increased with increasing concentration of disintegrants. The highest value was found for the tablets with the

highest concentration of crospovidone. The type of filler had no significant effect on the porosity of tablets. The more suitable method for evaluating the compressibility of tableting mixtures and granular powders was the method of preparing tablets with the same porosity.