

#### a) Influence of technological factors on fluctuations in powder flow

Powdered materials are one of the more commonly used in the food and pharmaceutical industry. Mechanical properties of powders determine their behavior in food and pharmaceutical technologies. In each of these cases it is very important to get a constant composition of the mixture and what is the decisive dosage.

The doctoral thesis is expected to study the mechanical characteristics of mixtures of food and pharmaceutical powders of different humidity and composition. The test will be carried out using standard methods and a new designed and constructed device for measuring the force generated by the material flowing out of the funnel into a flat surface.

#### b) Mechanical parameters and characteristics of intelligent structures formed by vacuum-sealed granules

A big progress and research on so-called intelligence materials might be observed during last few years. One of the area of interest in this field are the structures performed by vacuum closed granular materials in flexible membranes. Despite of quite wide range of application of vacuum closed materials there is still a need to get characteristics of such structures in dependence of mechanical and geometrical parameters of granules and vacuum range applied as well as in dependence of sac material used.

The aim of the project is to investigate mechanical parameters and to determine characteristics of vacuum packed structures of granular materials. The research will focus on the analysis of influence of size, shape and stiffness of granules as well as the surface of particles on properties of vacuum packed structures. The dynamical test will be also performed. The practical results of the realized project will be the catalogue of requirements of such structures, used in shock absorber in transport for agro products. The best solution for application of vacuum packed structures will be provided.