Summary

Schmidt hammer is the instrument which is used for the assessment of rock mechanical properties and this instrument is classified as the indirect method. This method is based on the assessment of rebound value (R) of the Schmidt hammer, which is measurred by the amount of rebound of the impact plunger from the surface of tested rock. Schmidt hammer is called as the non-destructive method of rock assessment and it is called as *in situ* testing method as well. The main objective of this work is provement, that Schmidt hammer testing is destructive method and define degree of damage which is caused in the rock mass.

Sedimentary rocks were used for the testing, mostly sandstones and arkose sandstones with different types of cement. This made it possible to test the fraction of the rock mass and the relation between fraction and type of cement. The clasts of the rocks had different properties than it was possible to find the relation between grain size and fraction of the rock.

Already in procedure of the testing by Schmidt hammer it was obvious, that this metod is definitely destructive. Rock surface after hitting by plunger of Schmidt hammer gains macroscopically observeable destruction. On the surface is the circular track of the plunger and the surface is grinded. It is possible to wipe the small fragments of grains from the surface by fingers. For the determination of destruction was also used the testing by more impacts of the plunger to the same place and obseravtion showed, that the destruction rises with the increasing number of impacts of the plunger.

Places of impacts were compacted by the resin with the fluorescent pigment and from these single parts have been made thin sections. The rock has been cutted perpendicular to the axis of the rebound. Because of this cut it is possible to observe features of the destruction under the surface of the rock. Thin sections have been studied in the optical microscope, microphotographies has been made and these pictures has been analysed by the specialised software. From the pictures have been determined grain and texture parameters of the rock which have been used for the desription and evaluation of the detruction.

The study of thin sections showed, that the impact of plunger creates the crushed zone which can be divided into the few parts and which reaches few millimeters under the rock surface. The crushed zone consists of small crater on the rock surface, under above mentioned zone is the grinded zone which cut into the zone of cracked grains. Approximately in one third of specimens were also observed cracks which protrude from the crushed zone to the undestroyed rock mass.

Evaluation of development of properties and parametres of grains in the impact zone of plunger allowed to create the basic model which demonstrates the destruction of the rock mass development with the rising number of impacts of the plunger. It is obvious that with the rising number of impacts are grains smaller and there is also the change in their shape. After few first impacts, grains crack to the elongated shapes and with the increasing number of impacts grains became more isometric.

The results of measurements have been compared to the past works which studied similar phenomenas in the graniotid rocks studied using by the indentation test. A few similarities have been observed but as well as some differences. It is probable that these differences are caused on one hand by the difference between rock types (sedimentary in this work and granitoid in past works) and on the other hand in the difference of the mechanism of testing methods.