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## **Validation of test methods in the determination of apparent density**

### **Abstract**

Research on the physical properties of rock materials and aggregates used for construction purposes should be based on standardized methods. Whereas scientific research are focused more on the development of new methods of research, test and evaluation of new properties, etc. In the case of own testing procedures and standardized but modified methods, should be validated before being put into use. Validation is the confirmation the ability to designate that method and test its usefulness. In order to investigate the method's possibilities, the following assessment methods can be used: calibration or precision evaluation using reference standards or reference materials, systematic evaluation of factors affecting the result, resistance of the test method to variability of controlled parameters, comparison of test results obtained by various methods, between laboratory comparisons, and uncertainty of measurement. The paper presents mathematical formulas allowing to evaluate the precision of research methods and the consistency of results, which are the basis for validation of research methods. In the practical part of the article, on the example of apparent density testing, the own method was validated based on the analysis of repeatability, internal laboratory reproducibility and between laboratory reproducibility.