



## **High resolution petrophysical and geomechanical logging of drill cores as a tool for the evaluation of dimension stone quality and durability**

Richard Prikryl (1), Tomáš Lokajíček (2), Zuzana Weishauptová (3), and Matěj Petružálek (2)

(1) Institute of Geochemistry, Mineralogy and Mineral Resources, Faculty of Sciences, Charles University in Prague, Prague, Czech Republic (prikryl@natur.cuni.cz), (2) Institute of Geology, Academy of Sciences of the Czech Republic, Prague, Czech Republic, (3) Institute of Rock Structure and Mechanics, Academy of Sciences of the Czech Republic, Prague, Czech Republic

Petrophysical and geomechanical properties are significant functional properties of natural stone. In the recent study, an approach employing the entire non-disturb parts of drill cores for determination of the key petrophysical and geomechanical parameters is presented. The drill cores have been obtained during exploration campaign for Carboniferous arkoses and arkosic sandstones to conglomerates in the Bohemian Massif (Czech Republic). The test procedure consists of the sequence of non-destructive methods including determination of index properties, ultrasonic characteristics (speed of longitudinal and transversal waves, recording of the full waveforms). Once non-destructively tested, the specimens are subjected to standard compressive and/or tensile tests encompassing recording of stress-strain behaviour. Broad range of values obtained reflects quite complex petrographical character of rocks investigated. Variable grain size, grain size homogeneity, degree of cementation, overall rock microfabric, and/or presence and distribution of inter- and intraparticle porosity seem to be determinative factors. Once calibrated for a particular petrographical characteristics, high resolution petrophysical and geomechanical logging (HRPGL) can serve as an effective tool for precise evaluation of exploitable natural stone quality.