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Degree of size reduction of selected crushed-stone source rocks and its relationship to technological-mechanical performance parameters

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Particle size reduction (PSR) is one of the principal processing methods employed in extractive industry including production of crushed stone aggregates. The purpose of particle size reduction is production of certain size fractions which are directly applicable for final uses or necessary for further industrial activities. On industrial scale, crushing of rocks for crushed stone production is commonly performed in 2-3 successive steps (stages). The conditions of crushing in these individual steps is selected in order to reach lower reduction ratio, thus facilitating production of particles with favourable geometry. Conditions of crushing are influenced by numerous factors, of which only part was thoroughly investigated. In the recent study, we attempt to correlate knowledge on PSR behaviour of various petrographic types with other technological-mechanical performance parameters (e.g. Los Angeles attrition value, Nordic abrasion test, aggregate crushing value) and/or physical / mechanical properties of aggregate source rocks (specifically volcanic rocks of variable composition, ages, and properties). PSR behaviour obtained by experimental laboratory crushing (one-step process) is reported as degree of size reduction and reduction ratio.