

Measurement of Shape Property Distributions of Quartzite Aggregate from Different Crushers using 3D Laser Scanning System

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Abstract:

Aggregate shape properties are used to characterize aggregate product from quarry operations. However, aggregate shape depends on rock type and crushing process. A meta-quartzite, a relatively low grade thermal metamorphic rock was crushed through four crushers. In this paper, a description is provided on the quantification of particle shapes using data from a 3-D laser scanning device. The images from the laser were fully utilized in quantifying the shape descriptors in order to identify the differences between individual aggregates. It was possible to quantify differences in particle shape characteristics at the small particle scale and aggregate shape distributions between the different types of crushers and possible influence of particle sizes as well as interaction effects. Aggregate products vary significantly according to the nature of their processing. For all the shape parameters, a statistically significant difference was found between the four different crusher types. For some of the shape parameters a statistically significant difference was also found amongst the particle sizes.