CALCULATION OF FRICTION FACTOR OF DRY GRANULAR SOLIDS BASED ON FRACTAL MODELING

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The concept of fractals, used for quantitative description of structural properties and the properties of surfaces of the dry granular solids friction, led to construction of an equation, that is to link the fractal dimension of the object structure with its internal friction factor at the shear resistance. The possibility of *a priori* calculation of such important physical and mechanical characteristics of dry loose and granular solids, as the friction factor, is practically very useful for the prediction and evaluation of efficiency of security technologies against deflation. Physical and fractal representations were used for construction of a calculation model (equation) of the friction factor of dry granular solids. Approbation of the model was made in 2016 on the mono-mineral fractions of the Terek-Kuma sands and the artificially created models of granular solids. The appliance of Znamensky was used for determination of an angle of a natural slope in the study of the internal friction factor. Comparison of the calculated values with the experimentally measured values of the friction factor showed good convergence of the modeling results. In some cases, the calculated and experimentally measured values of the friction factor had a discrepancy not more than half of a degree. The results of statistical evaluation of the model are as follows: the Pearson coefficient (R^2) - 0,97; confidence interval - 9.50; the relative error of the model - 11%. Building codes in determining of the internal friction factor of granular solids allow error up to 15%. As the studies have shown, the proposed model for the calculation of the internal friction factor of dry granular solids is adequate and effective.

Key words: deflation, calculation, friction factor, shear resistance, similar, fractals.