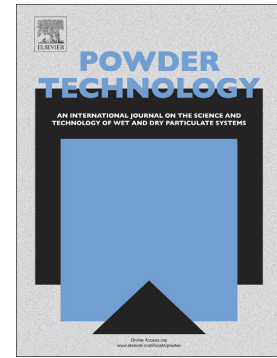


Accepted Manuscript

Shear strength of granular materials based on fractal fragmentation of particles

Yongfu Xu

PII: S0032-5910(18)30184-0
DOI: [doi:10.1016/j.powtec.2018.03.001](https://doi.org/10.1016/j.powtec.2018.03.001)
Reference: PTEC 13232
To appear in: *Powder Technology*
Received date: 16 October 2017
Revised date: 23 January 2018
Accepted date: 2 March 2018



Please cite this article as: Yongfu Xu , Shear strength of granular materials based on fractal fragmentation of particles. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Ptec(2017), doi:[10.1016/j.powtec.2018.03.001](https://doi.org/10.1016/j.powtec.2018.03.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Shear strength of granular materials based on fractal fragmentation of particles

Yongfu Xu ^{1,2}

1 Depart of Civil Eng, Shanghai Jiao Tong University, Shanghai 200240, China; yongfuxu@sjtu.edu.cn

2 Wentian College of Hohai University, Maanshan 243000, China

Abstract: The Mohr-Coulomb criterion has two shear strength parameters commonly known as the cohesion and the friction angle. The peak shear strength of granular materials obtained from direct shear tests has common non-linear strength envelopes due to particle crushing. The effective cohesion continues to increase while the effective friction angle decreases with the increase of effective stress in direct shear tests. Particle crushing of granular materials in direct shear tests leads to a power-law distribution of fragment sizes, and is accurately characterized by the fragmentation fractal dimension drawn from the power exponent. Based on the fractal model for particle fragmentation, a power function is advocated to represent the shear strength criterion of granular materials involving only two constant parameters. The exponent of power-law shear strength criterion is found to express using the fragmentation fractal dimension. The proposed power-law shear strength criterion is validated with experimental data of municipal solid waste incineration (MSWI) bottom ashes from direct shear tests.

Key words: Particle crushing, Shear strength, Direct shear test, Fractal dimension, Municipal solid waste incineration (MSWI), Bottom ash.

Download English Version:

<https://daneshyari.com/en/article/6674605>

Download Persian Version:

<https://daneshyari.com/article/6674605>

[Daneshyari.com](https://daneshyari.com)