31.07.2023

Hiwi student

Particle sieving and characterization

Motivation:
Granular material, whether occuring naturally or manufactured artificially, are typically found in a dispersed state, where particles of varying sizes and shapes exist. The size distribution and shape of a particle have a strong influence on the quality of the process in which the granular material is used. [1] Consequently, it is essential to determine the particle size, shape, and additional relevant particle properties prior to their usage in a process.

Sieving is a powerful technique for fractionating particles based on their size, leading to a narrower particle size distribution. Depending on the particle size, particles either pass through the sieve meshes or are retained on the sieve surface.

a)

b)

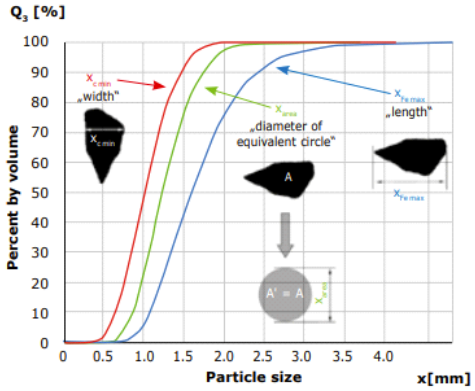

Figure 1: (a) Vibratory sieve shaker and test sieves [2]. (b) Particle size distribution and dimensions calculated using Camsizer - XT [3].

Tasks:

- Particle sieving
- Determination of particle size distribution and particle shape
- Determination of further particle properties such as particle density and mechanical stability

Starting date: October 2023

Duration of the contract: 2 months / 10 hours per week

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References: [1] Retsch GmbH. The Basic Principles of Sieve Analysis. [2] Retsch GmbH. Sieving and Pulverization of Metal Powders. [3] Retsch GmbH. Particle size and shape characterization by Dynamic Image Analysis.