

Granutools assesses flow properties of metallic powders

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Grain size vs fluidity

Granular materials and fine powders are frequently used in industrial applications. In order to control and optimise processing methods, these materials must be precisely characterised. The characterisation methods are either linked to the properties of the granules or to the behaviour of the bulk powder. For techniques such as SLS, SLM and EBM, the resolution of the layers products are made of depends on the grain size: the smaller the grain, the higher the resolution, but also the higher the cohesion and lower the fluidity of the powder. Therefore, a compromise between grain size and fluidity must be found.

However, as far as the physical behaviour of bulk powders is concerned, most of the techniques used in R&D or quality control laboratories are based on outdated measurement techniques. Over the last decade, these techniques have been updated to meet today's requirements of R&D laboratories and manufacturing departments. The measurement processes in particular were automated and extensive initiation methods were developed to achieve reproducible and interpretable results. In addition, the use of image analysis techniques improves the precision of the measurements.

Validation of new measuring techniques

Granutools developed a number of measurement methods to meet all the needs in the industrial processing of powders and granular materials. During the research it appeared that the spreadability and triboelectricity of powders can easily be monitored with the new measuring techniques. Sirris provided the necessary powders and conducted all the experiments on its 3D printers.

With the GanuDrum measuring instrument, the fluidity and spreadability of powders can be measured automatically based on the principle of a rotating drum. The findings obtained through experimental research were consistent with the visual observations Sirris was able to make on its 3D printers. An image processing algorithm was used for the observations.

Additional tests were conducted in order to make a scientific publication together based on the findings. This paper showed that the spreadability and triboelectricity of powders can easily be monitored with the newly developed measuring techniques.

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