

## Fertilizer

### Particle size and shape analysis for defined dilution

Fertilizers are organic or inorganic nutrients for plants which may be either liquid or granular. They are used to enrich the soil in order to improve the quality and/or quantity of plant growth. The CAMSIZER is needed for quality assurance as the fertilizer needs to have a very defined size distribution to ensure a certain dilution time and controlled release of nutrients.



#### Production of fertilizer

Because of occupational health and safety (respirability of fertilizer powder) and environmental aspects (formation of dust) fertilizer manufacturers are forced to granulate the fertilizer powders. This improves the handling and does not affect the molecular structure of the product in any way.

Fertilizers must be produced in similar sizes (e.g. 3mm) and within a close size range (narrow size distribution e.g. 2-4mm), so that they can be mixed (blended) without segregating.



When the raw material is very fine (powders), the powders are pressed between two rollers to produce a 1-2 cm film of hardened fertilizer. This film is crushed and the produced particles are classified by production sieves.

Only 50%-80% of the final product has the right size distribution. Smaller particles have to be pressed again, whereas

too big particles have to be crushed again.

When the raw material consists of crystals, a roll granulation process produces bigger granules of fertilizer particles. When the particles have a certain size they are taken out of the granulation process.

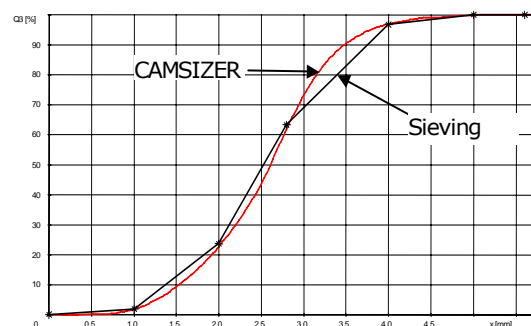
Some granulated fertilizers are coated for better handling and a longer effective period (action time).

#### Quality Assurance

Fertilizer producers need quality control for incoming goods, production and for outgoing products. Some companies use particle measurement systems in the quality lab, some use them at-line or on-line. Many fertilizer producers, such as Bulk Blending companies, mix different fertilizers to obtain a specific nutrient content of the soil.

A basic requirement for most applications is that the fertilizer granules have a defined particle size distribution and shape in order to obtain a certain dilution rate and action time.

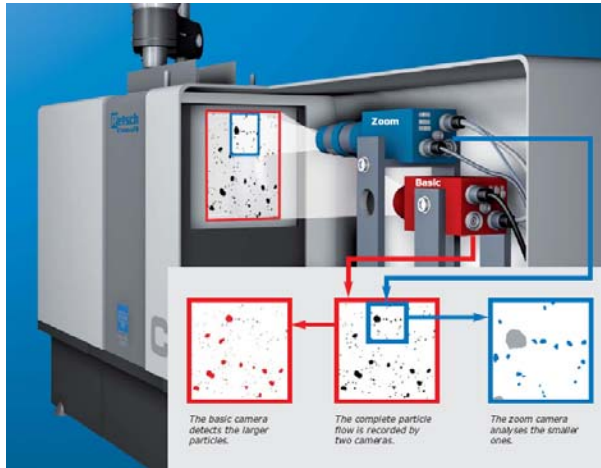
Furthermore particle size analysis is so important that a minimum frequency must be assured. Especially in the night time it is difficult to provide sufficient quality control.



## Benefits at a glance

- High resolution especially for small size distributions
- Reliable particle size and shape information
- Short measuring time (2-3 min)
- Easy to calibrate, maintenance free
- Results in agreement with sieve analysis
- Shape analysis to detect broken or aggregated granules

## Measuring Principle



The patented measuring setup of the CAMSIZER – two digital cameras as an adaptive measuring unit – improves and optimises particle analysis by digital image processing. Therefore, it is possible to measure a wide range of particles from 30 µm to 30 mm with extreme accuracy, **without having to switch measuring ranges or make adjustments**. The sample is fed in from the feed channel so that all particles fall through the measurement field. During the measurement procedure the two digital cameras (CCD) perform different tasks. The basic camera (CCD-B) records large

particles, the zoom camera (CCD-Z) records the small ones. The contact-free optical measurement is carried out in real time and simultaneously obtains all the required information about particle size and particle shape. A modularly configurable online version of the instrument has been developed to allow automated measurements to be conducted continuously.

For further information please visit our website [www.retsch-technology.com](http://www.retsch-technology.com) or contact us personally:

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