

Rice

Size measurement of broken grains

Application



Since rice is a basic foodstuff, its product quality has to be controlled carefully.

Particle size analysis and control of the product appearance is carried out in almost every plant, as the size and shape not only influence the taste or appearance of the final products, but are also important indicators for the production process itself.

Demands of quality assurance

ISO 7301 (EN) describes the specifications for rice, and the analysis methods to control these specifications. Besides tests for moisture, odour, and detection of impurities and insects, the average size and the amount of broken grains is of critical interest. Additionally the price and the customs duties depend for example on the amount of broken, malformed/misshapen, or chalky kernels.

ISO 7301 describes manual procedures to measure the average size of the rice grains by using a micrometer (calliper), and to determine the amount of broken kernels. This procedure is labour-intensive, provides rather unreliable statistics (only a few kernels are analysed), and is very subjective (influenced by operator).

Solution

With the CAMSIZER it is possible to analyse the **average length of the rice grains** and the amount of broken kernels fully automatically, independent of operator errors, and with high speed for significant amounts of sample.

The CAMSIZER delivers reliable, reproducible and fast results in full compliance with the hand measurement as specified in the standard ISO 7301 (see Fig. 1). Equipped with an **AutoSampler** the

CAMSIZER is able to measure approx. 900 samples per week. The instrument can also be integrated in the production control and can be operated 24/7. The AutoSampler allows even untrained operators to analyse samples from different places in the production easily and frequently, by using barcodes to distinguish different sample types. The speed and quantity of the measurements reduces rejects and waste, and helps to control the production parameters.

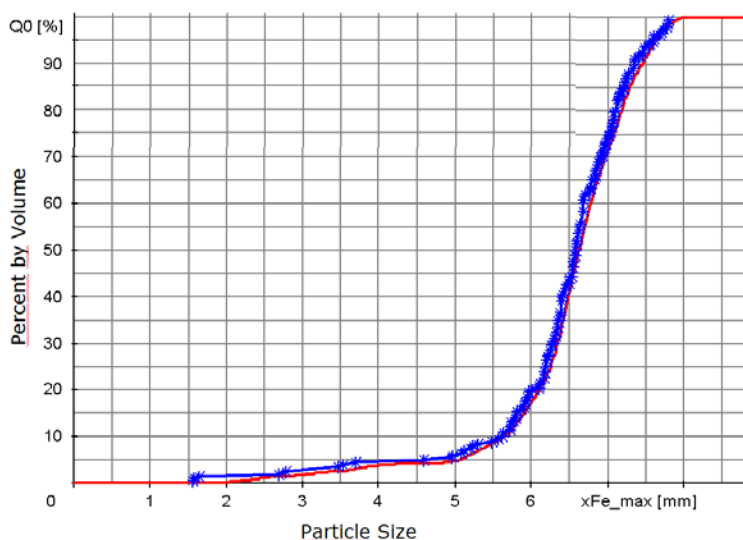


Fig. 1.
Comparison of
hand (blue) and
CAMSIZER® (red)
measurement of one type
of rice.
Other types (wild rice,
carnaroli etc.) show the
same compliance.

CAMSIZER® - Benefits at a glance

- much faster than hand measurement (x100)
- identical results to hand analysis
- larger samples quantities provide better statistics
- high sample throughput
- more objective
- less manpower required
- works for all tested types of rice
- Fully automated, with AutoSampler
- counting: almost correct number of grains (within 10%)
- larger sample quantities provide better statistics
- excellent reproducibility
- easy to use, different software levels enable operation by unskilled personnel
- maintenance free, robust design



Fig. 2
CAMSIZER® with Autosampler

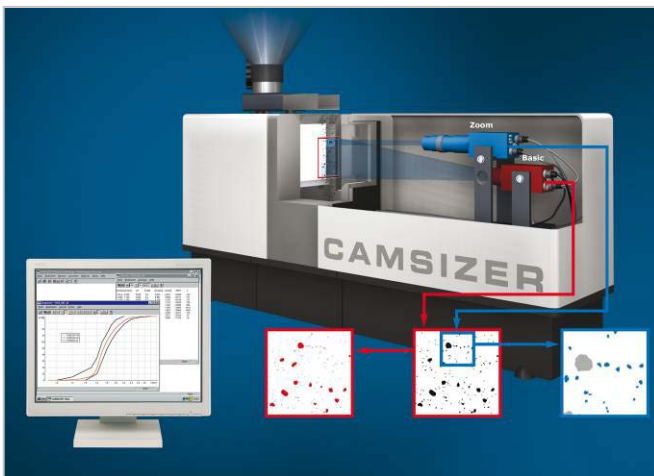
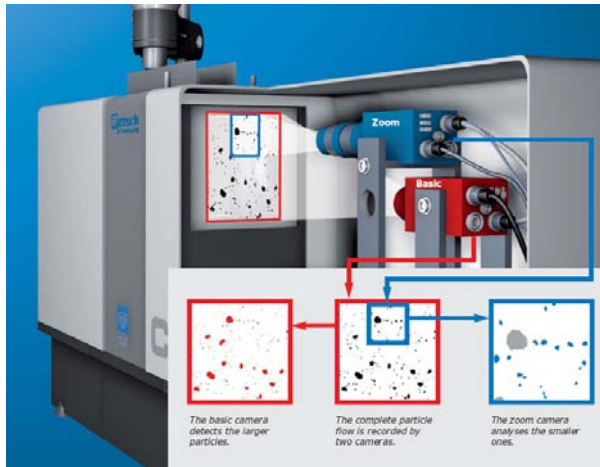


Fig. 3
CAMSIZER®:
two camera system

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.

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