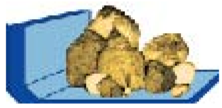
PMP *PARSIZE*

Views and Calculations of Particle Size Distributions



THE PARTICLE SIZE DISTRIBUTION

The mass related particle size distribution $Q_3(x)$ is the most important grading information for describing homogeneous grainy materials.

PMP ParSize reflects this information as a discrete Q(x) distribution. For this, an arbitrary subdivision of the particle size range into size classes will be supported. The separate and independent administration of different particle size sequences enables both, a simple individual adaptation of the Q(x)-Distribution and the standardization of the data which have been supplied by different sources.

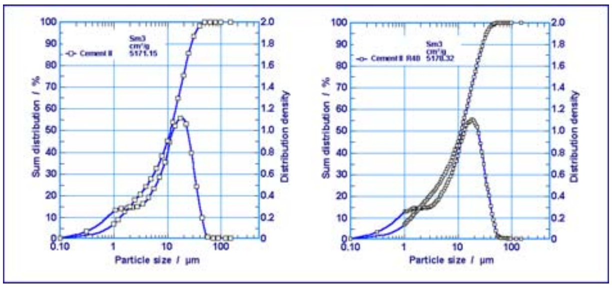


Fig 1: Conversion of particle size distributions from a subdivision R10 (left fig.) into a finer R40 sequence (right fig.).
Attention! The linear interpolation results in a smooth cumulative curve and a rough distribution density curve. Therefore in PMP a smoothing method is applied, which ensures that the distribution density curve will be also sufficiently smooth and the Q(x)-Distribution doesn't change significantly.

The Q(x) distribution can be displayed in graphs and in tables according to ISO 9276-1 standard as

- particle size distributions Q(x)
- cumulative oversize curve 1-Q(x)
- linear distribution density q(x)
- logarithmic distribution density q*(x)
- fractions (stand. and mass related) p(x)

Different grids are available for the graphical display:

- linear grid
- semi-logarithmical grid
- full-logarithmic grid
- RRSB- (Weibull) grid
- probability grid
- square root grid

CHARACTERISTICS ACCORDING TO DIN 66141

Apart from the discrete Q(x)-Distribution the following characteristic values can be calculated:

- Q(x*) values for arbitrary particle sizes x*
- x(Q*) values for arbitrary Q* values
- mean particle size
- Sauter-Diameter
- volume- or mass related surface
- Blaine surface using a calibration curve
- standard deviation (distribution width)

The calculation will be effected automatically on each change in the Q(x)-Distribution. The characteristics to be determined can be specified locally and globally, so that an individual and uniform calculation is ensured.

The calculations consider:

- the material density
- the particle shape or sphericity
- the work index
- the bulk density or porosity

All characteristic values can be displayed in the diagram legend or in the table appendix respectively together with the Q(x)-Distribution.

FUNCTIONAL APPROACHES

For data reduction purposes the discrete Q(x)-Distributions can be approximated by the following functional approaches:

- RRSB-Distribution
- Log-normal distribution
- GGS power distribution

Optionally, all characteristic values can be calculated via the selected approximating function.

EVALUATION OF EXPERIMENTAL SERIES

The Q(x)-Distributions of experimental series are administrated together in so called PMP-Projects. This enables applying all visualisation methods for an arbitrary combination of the individual material objects. Important relations and trends can be determined by means of the module PMP AC.

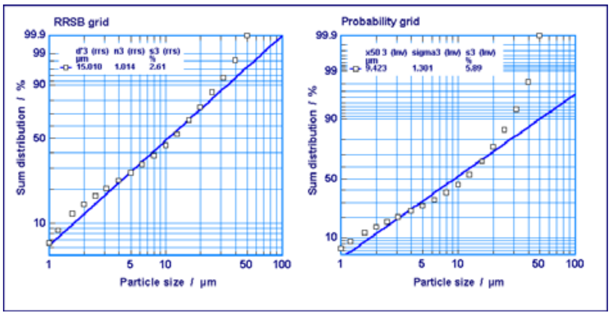


Fig. 2: Representation of a Q(x)-Distribution in a RRSB-Grid (left) and in a probability grid (right).

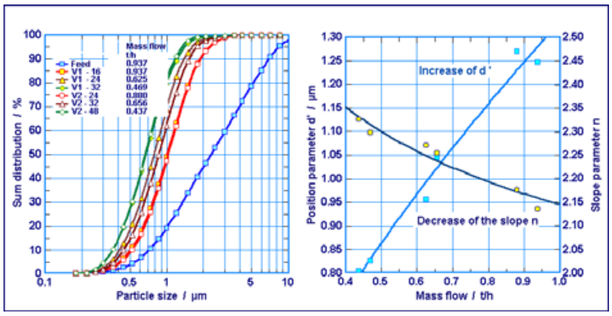


Fig 3: Common display of all Q(x)-Distributions from a series of grinding experiments (left). Mass flow influence on the RRSB parameters d' and n (right).

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