Physical Characterization of Ceramic Powders, Processing Systems, Green Bodies and Bulk Materials

The behavior of ceramic semi-finished bodies, bulk materials and components in use depends mainly upon

- the physical characteristics of the original powder, e.g. its active powder surface or particle-size distribution (Figure 1)
- the processability (pressing or extrusion behavior, castability, etc.) of the granules, mixtures, pastes and slurries (Figure 2)
- the drying and sintering behavior of the green bodies
- the properties of the semi-finished bodies (Figure 3) and final components

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**Figure 1**

Powder characterization

The average diameter \( d_{50} \) is approx. 30 µm, as determined by laser granulometry.

**Figure 2**

Rheological behavior of a slurry

Flow and viscosity curves of an \( \text{Al}_2\text{O}_3 \)-slurry with 80 wt% solids loading, showing shear-thinning behavior.

**Figure 3**

Biomimetics

Pore size distribution in ceramized pine after SiO-infiltration at 1800°C/4h, 70 vol% porosity. Potential applications: filters, catalysis substrates.

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**Our services**

**Powder**
- Specific gravity
- Specific surface area
- Particle size and size distribution
- Particle shape

**Processing systems**
- Slurries
- Pastes (rheology)

**Green bodies, bulk materials and components**
- Specific gravity
- Specific surface area
- Grain size and shape
- Pore size and size distribution
- Pore shape
- Elemental distribution

**Helium pycnometer**
- BET
- Sieve tower, laser granulometer, PCS
- Light and electron microscopes
- Rotation viscometer, zetameter
- Torque rheometer, capillary rheometer
- Archimedes’ Principle, helium-pycnometer
- Light and electron microscopes
- Mercury intrusion porosimeter
- Light and electron microscopes
- Element mapping

Further possibilities and a list of our accredited procedures are available on request.

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**Your benefits**

- Professional physical characterization of ceramic powders, processing systems, green bodies and bulk materials
- Development, validation, testing, evaluation and analyses by a qualified partner

**Your contact**

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