Typical AccuPyc 1340 Applications

micromeritics®
The Science and Technology of Small Particles™

Typical AccuPyc II 1340 Applications

Pharmaceuticals – Composition of active and excipient ingredients can be monitored and controlled through determination of product density. Polymorphic, hydrated, and amorphous forms of products, as well as purity, can be determined by comparing measured density with theoretical and historical values.

Coatings – Dried film density can be used in determination of Volatile Organic Compound (VOC) content of clear and pigmented coatings. VOC reporting is required by government regulations. In addition, total solids content can be used to determine minimum coverage obtainable with different coating blends. Mixtures of dry pigments can be monitored by comparing measured density with theoretical density based upon composition of the mixture.

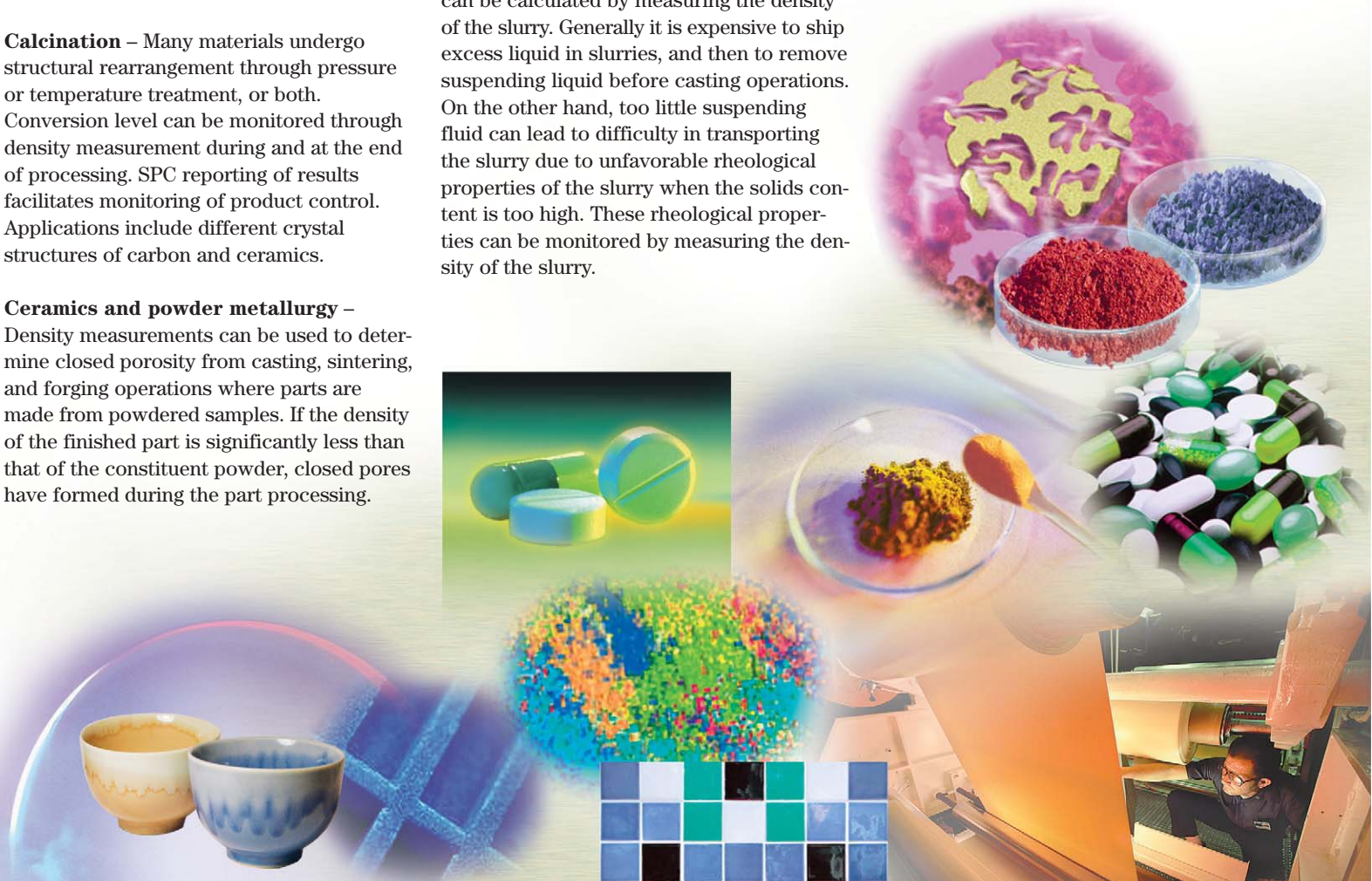
Calcination – Many materials undergo structural rearrangement through pressure or temperature treatment, or both. Conversion level can be monitored through density measurement during and at the end of processing. SPC reporting of results facilitates monitoring of product control. Applications include different crystal structures of carbon and ceramics.

Ceramics and powder metallurgy – Density measurements can be used to determine closed porosity from casting, sintering, and forging operations where parts are made from powdered samples. If the density of the finished part is significantly less than that of the constituent powder, closed pores have formed during the part processing.

Rigid cellular plastics – Closed-cell rigid plastics (foams) exhibit different properties based upon the ratio of open and closed cells. Insulation foams limit thermal conductivity through pockets of trapped gases contained within closed pores. Flotation devices, likewise, owe buoyancy to closed air-filled pores that prohibit water entry.

Plastic films – Plastic films are produced through extrusion of plastic beads. Film quality is related to the amount of encapsulated air in the starting beads. Density can be used to determine the quantity of entrapped air. In addition, the degree of crystallinity of the final film can be determined using density. Brittleness of the film increases with crystallinity, while strength decreases.

Slurries – With knowledge of the dry powder and suspending liquid densities, the quantity of liquid in a slurry mixture can be calculated by measuring the density of the slurry. Generally it is expensive to ship excess liquid in slurries, and then to remove suspending liquid before casting operations. On the other hand, too little suspending fluid can lead to difficulty in transporting the slurry due to unfavorable rheological properties of the slurry when the solids content is too high. These rheological properties can be monitored by measuring the density of the slurry.

Organic chemicals and polymers – Polymerization and organic reforming processes are used to produce desired compounds from raw materials. Conversion and purity can be monitored by comparing measured density to theoretical density of the desired product.

Blending of materials – Many powder products are shipped and used as blends of primary ingredients. The accuracy and reproducibility of the blend can be monitored by comparing the measured densities to the expected density based upon the target recipe of primary ingredients. The high degree of accuracy and precision of the AccuPyc helps ensure that the blends produced at a given plant match the desired recipe, the previous lots of materials, and those from other locations, regardless of the industry where these blends are used.