

**MME 2011 CERAMIC MATERIALS I LABORATORY**  
**Experiment 1**  
**Raw Material Preparation and Particle Size Analysis**

**1. Objective of the Experiment**

- To learn industrial techniques for size reduction and homogenization of raw materials
- To measure particle size and surface area of ceramic powders with traditional and advance characterization equipments

**2. What you should know before the experiment?**

You should know;

- What are the sampling methods and what are they used for?
- What is the importance of particle size control in materials processing?
- What are the milling methods and their mechanisms of particle size reduction?
- What are the particle size analysis methods and their principles? What kind of information could be obtained from these techniques?
- What do “isometric particle” and “anisometric particle” mean?
- What is ‘Equivalent Sphere Approach’, and in which particle size analysis techniques is this approach used?

**3. What will you learn during the experiment?**

You will learn;

- How to prepare representative samples by Alternative Shovel, Cone and Quartering, and Splitting methods?
- How to carry out dry and wet milling?
- How to determine particle size distribution by sieving, laser diffraction and sedimentation methods?
- How to measure specific surface area of a powder by using BET equipment?

**4. Important points / hints for the equipments and/or results obtained from the analyses**

- Why particle size control is important and why particle size analysis should be performed
- Using complementary techniques (e.g, laser diffraction and SEM) for precise characterization of particle size and size distribution
- Choosing appropriate milling and particle size analysis techniques
- Reasonable interpretation of the results