Particle size characterization is essential in many processes in a large number of industries and research areas, including pharmacology, cosmetics, nanotechnology, paints, pigments, food science, ceramics, textiles, geological science, polymer science, environmental science, catalysts and powder metallurgical science.

The term “particle size characterization” can be used to cover size measurement only, or any combination of size, shape, zeta potential, surface area and other parameters.

One of the most widely used techniques for determining particle size is light scattering, which is a popular technique for determining particle size. Dynamic light scattering can be used to measure the size of particles in solution, while static light scattering is used to measure the size of particles in suspension. Dynamic light scattering is particularly useful for measuring the size of polydisperse suspensions, while static light scattering is more suitable for measuring the size of monodisperse suspensions.

Dynamic light scattering involves measuring the intensity of light scattered from a sample as the sample is stirred. The scattered light intensity is inversely proportional to the fourth power of the particle diameter, so by measuring the scattered light intensity, the particle size can be determined. Dynamic light scattering is particularly useful for measuring the size of particles in solution, as it can be used to measure the size of particles in solution that are too small to be measured by ordinary optical methods.

Static light scattering involves measuring the intensity of light scattered from a sample that is stationary. The scattered light intensity is again inversely proportional to the fourth power of the particle diameter, so by measuring the scattered light intensity, the particle size can be determined. Static light scattering is particularly useful for measuring the size of particles in suspension, as it can be used to measure the size of particles in suspension that are too small to be measured by ordinary optical methods.

When purchasing a particle characterization instrument the first consideration should be what characteristics need to be measured. Laser diffraction instruments are widely used for size measurements only. Image analysis instruments are used to measure both size and shape, while acoustic spectroscopy instruments can be used to measure both size and zeta potential.
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