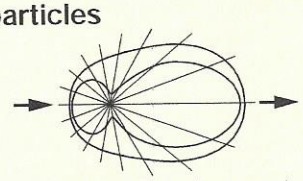
2 Widest dynamic range: 1:100,000 (0.02 to 2,000µm)

Light scattering measurement

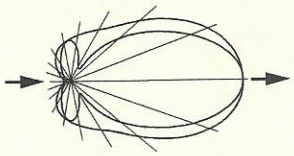
When light strikes particles, scattering (diffraction) occurs. The light scatters in all directions, but for larger particles there is relatively more scattering to the front while for smaller particles there is relatively more scattering to the sides and back. As shown in the figure to the right, the forward scattering intensity doesn't show great variation for particles under 0.2µm, while there are distinct variations in intensity to the sides and back. It is therefore impossible to measure the diameter of small particles without measuring the scattering distribution to the sides and back.

Tungsten lamps, with their shorter wavelength, are preferable to the longer wavelength He-Ne lasers for creating good scattering patterns in smaller particles. The shorter the wavelength of light, the smaller the particles that can be measured. Particle diameter is calculated with the aid of Mie theory according to the pattern of scattering observed.

Scattering variations in minute particles



Particle diameter 0.16 µm (He-Ne laser)
Particle diameter 0.10 µm (Tungsten lamp)



Particle diameter 0.18 µm (He-Ne laser)
Particle diameter 0.12 µm (Tungsten lamp)

The scattering pattern does not depend directly on the particle diameter, but rather on the relationship between the wavelength used and the particle diameter.

Wide range, from 0.02 to 2,000µm

The LA-920 employs HORIBA's unique optical system, which includes a He-Ne laser for large particles as well as a tungsten lamp for fine particles. This makes the unprecedented particle diameter measurement range of 0.02 to 2,000 µm a reality. The LA-920 can precisely measure particles anywhere in its range in a single operation.

High accuracy and high resolution

HORIBA didn't simply increase the number of detectors; we also developed a revolutionary ring detector, precisely engineered to the micron level, for even higher measurement efficiency.

Measurement diagram