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Determination of particle size distributions for fine ceramic raw powders by laser diffraction method

1 Scope This Japanese Industrial Standard specifies the measuring method of particle size distributions utilizing the detection of scattering strength distribution cause by irradiation of laser on the fine ceramic raw particles dispersed in the liquid phase.

Remarks : The following standards are normative references to this Standard:

JIS M 8100 *Particulate materials—General rules for methods of sampling*

JIS R 1622 *General rules for the sample preparation of particle size analysis of fine ceramic raw powder*

2 Definitions For the purpose of this Standard the following principal definitions apply:

- (1) **scattering strength distribution** The dependence of the intensity of light scattered by particles on the scattering angle.
- (2) **scattering angle** The angle between the direction of radiation of laser beam and the direction of scattered light.
- (3) **relative refractive index** The ratio of absolute refractive index of sample to the absolute refractive index of dispersion medium.

3 Principle of measurement When the particles dispersed in the liquid are irradiated by laser beams of the known wavelength, these particles present scattering appropriate to the individual size, shape and optical properties thereof. In the fundamental optical system given in Fig. 1, the component in front region from among the said scattering beams is collected by a condensing lens, and the scattering strength distribution is detected by the detector arranged on its focal plane ⁽¹⁾. The particle size distribution is obtained by analyzing the data so detected on the basis of Mie scattering theory, Fraunhofer diffraction theory and the like.

Note ⁽¹⁾ In order to measure the more micro particles, the information of scattering strength in side and rear may also be utilized.