

# Application News

## No. Q111

### Powder Property Analysis

## Particle Size Distribution Measurement of Hair Treatment

### Introduction

The role of hair conditioner is to supplement the oil lost during shampooing, so as to soften and make the hair supple. It also loosens entanglements that occur due to shampooing, smoothing the hair to make it easier to comb and brush. At the same time, it acts to suppress static electricity that can occur while brushing the hair, preventing the adherence of dust. To achieve these effects, cationic surfactants, oils and emulsifiers, etc. are blended in as ingredients of hair conditioner. Hair conditioner typically has a creamlike consistency, indicating that these ingredients exist as particles in an emulsion.

Here, we report on the results of measurement of the particle size distribution in hair conditioner using the SALD-7101 nano particle size analyzer. First, we conducted measurement using the typical method of diluting the sample with water, and transferring it to a batch cell (Fig. 2). Next, using a high-concentration sample measurement system, the original liquid was measured as is, without dilution (Fig. 3). A comparison of these results is presented.



Fig. 1 SALD-7101 Nano Particle Size Analyzer

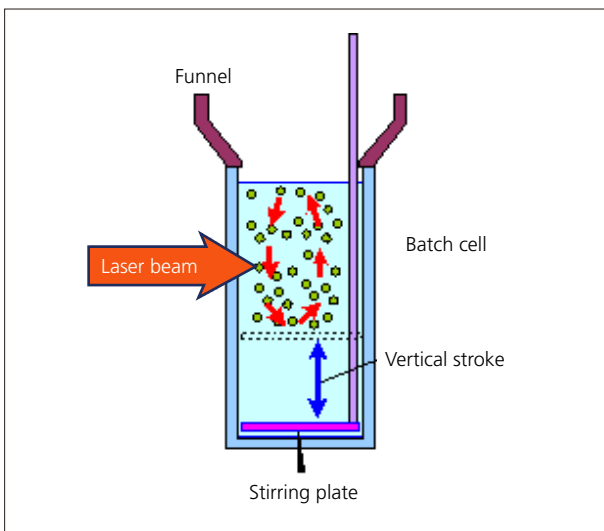


Fig. 2 Batch Cell

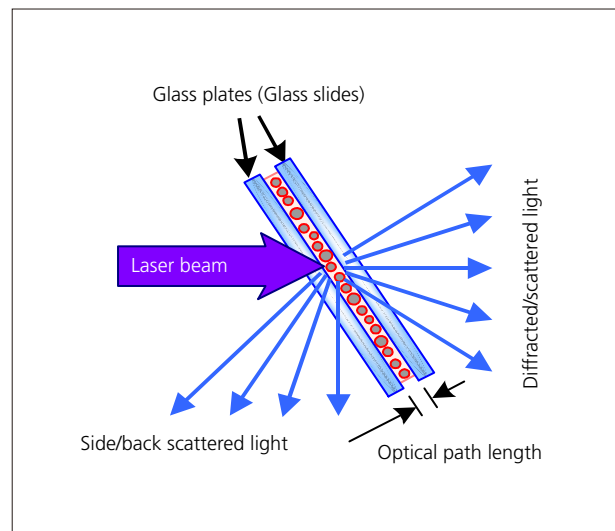


Fig. 3 High-Concentration Sample Measurement System

■ Test Samples and Results

Commercially available hair conditioners were used as samples. Fig. 4 shows the measurement results for both of the samples in the diluted state as well as in the original, undiluted state.

Comparing the measurement results from the original, undiluted liquid with those of the diluted samples, it is clear that there is an overall shift in distribution of the particle size to larger values, due to dilution. However, not only is there a difference in particle size distribution, but comparing the scattered light intensity distribution

of the raw data generated using the laser diffraction/scattering method, it is clear that the distribution begins at small sensor element numbers as a result of dilution, and that it includes coarse particles. This is thought to be due to the agglutination of constituents. Thus, when conducting measurement of samples in which the scattering state changes due to dilution, it is effective to conduct "measurement of undiluted, original sample liquid" using a high-concentration sample measurement system.

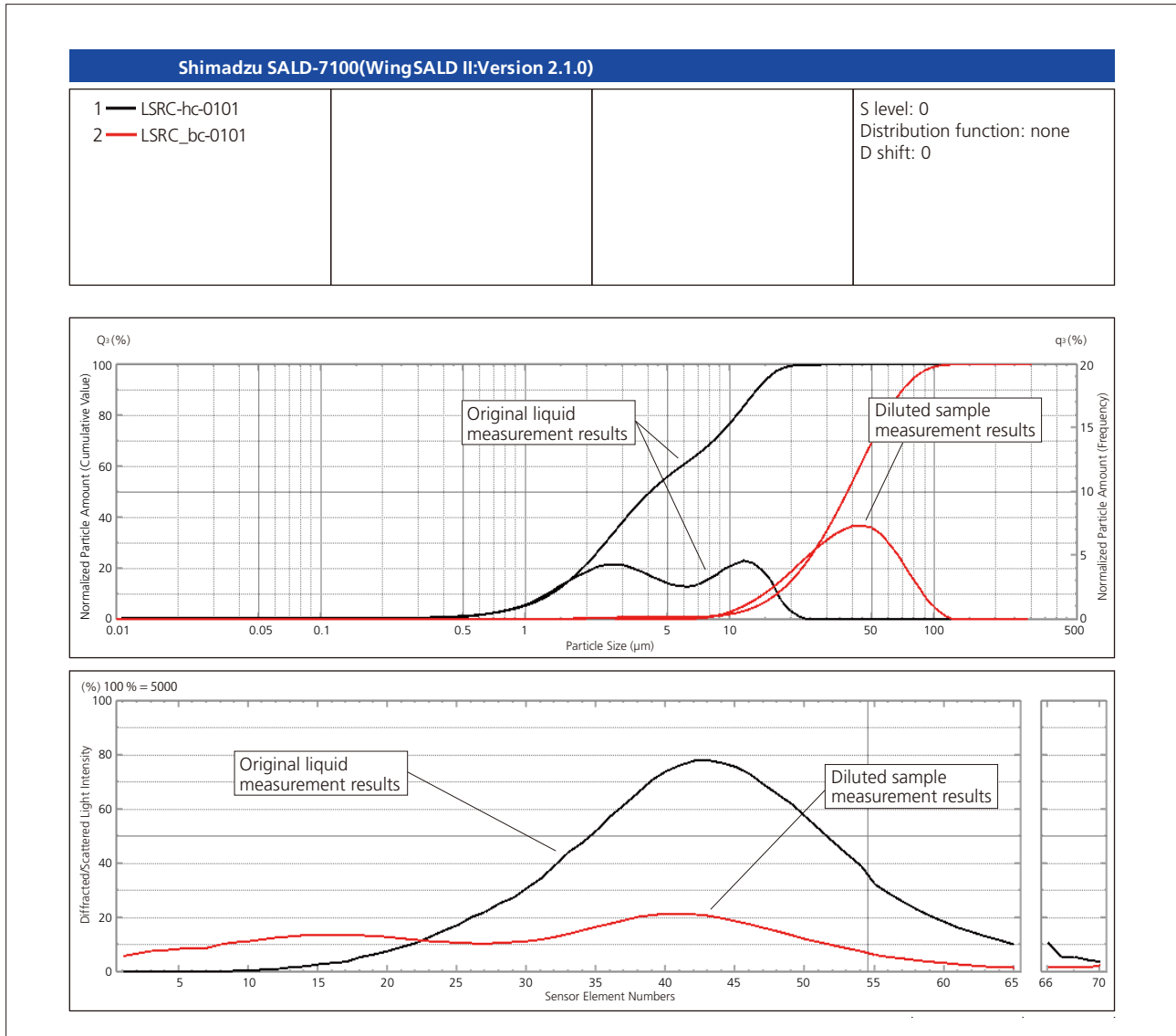


Fig. 4 Hair Conditioner Particle Size Distribution