

Application News

No. EG-05

Particle Size Measurements

Measuring of Printing Ink

SALD-2201 and HC -21

Alternative instruments and accessories leading to similar results:

- SALD -1000 Series with HC



image: squeegee

Background

Gravure is a printing technology chosen for several materials that are present in our daily use such as publications and magazines with high circulation, packaging or laminate for floors and furniture.

Properties such as color shade, color strength and dilutability can be tailored to customers' needs. Furthermore gravure printing is a very cost-effective technology used with high print runs.

Measurement

Viscosity and particle size of the pigments may vary within wide bounds. Especially for printing inks with a rather high viscosity Shimadzu's HC (high concentration) cell is a versatile tool. The HC cell is a holder for two rectangular glass plates. For a measurement a small amount of the ink is placed in the middle of the first glass plate. The second glass plate is put on top of the first plate to

form a thin ink film between the two glass plates. Air bubbles between the glass plates should be avoided because they disturb the measurement.

Special glass plates with an indentation guarantee that the film thickness is constant.

For very pasty samples the use of just one glass plate with a squeegee can be reasonable.

The bottom side of the squeegee has gaps with a particular depth. Again only a small amount of the ink is placed in the middle of the first glass plate.

By pulling off the ink carefully with the squeegee over the glass substrate a homogenous layer with a defined thickness is made.

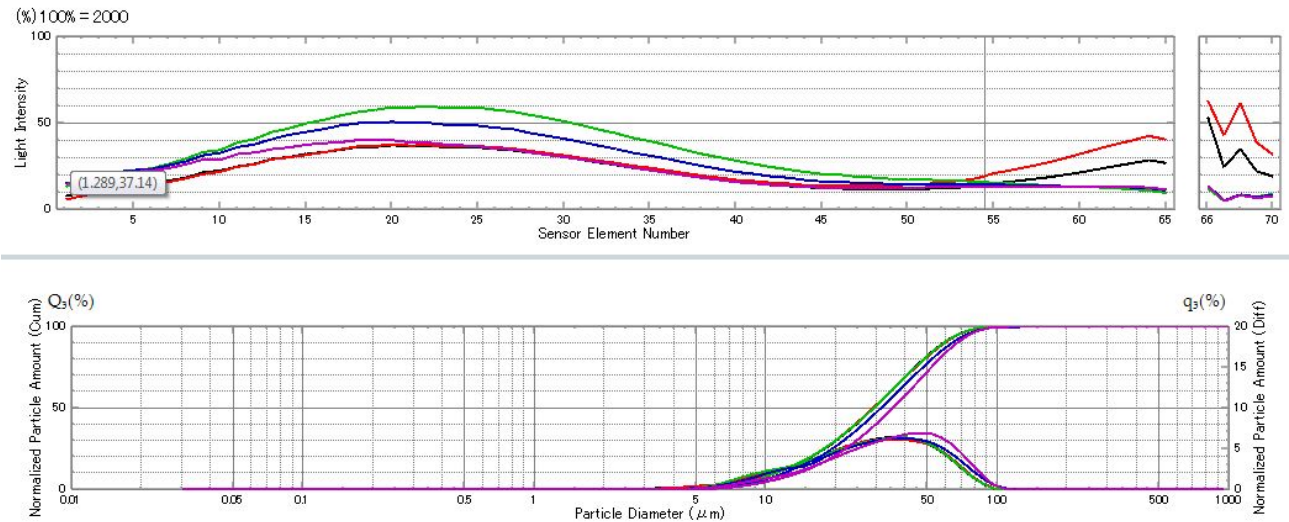
For following measurement a squeegee with a depth of 90µm is used

Discussion

(Please find measurement results on the next page)

The advantage of this HC cell is that the ink can be measured as it is. No dilution of the sample is needed to fit the measurement requirements of the particle size instrument.

Results



	Median D (μm)	Modal D (μm)	Mean V (μm)	Std Dev	25%D (μm)	50%D (μm)	75%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)	0%D (μm)
1	29.009	34.429	26.730	0.284	17.715	29.009	43.813	0.000	0.000	0.000	0.000	0.000	0.000
2	28.821	34.429	26.792	0.283	17.624	28.821	44.165	0.000	0.000	0.000	0.000	0.000	0.000
3	29.037	34.429	27.037	0.273	17.604	29.037	44.011	0.000	0.000	0.000	0.000	0.000	0.000
4	31.257	34.429	29.137	0.278	19.151	31.257	47.413	0.000	0.000	0.000	0.000	0.000	0.000
5	35.101	42.312	32.253	0.267	21.834	35.101	51.660	0.000	0.000	0.000	0.000	0.000	0.000

The second graph shows a volume based particle size distribution of a pasty magenta colored printing ink. The sample was measured 5 times.

