Explanation of the measuring report

ONLINE NANOPARTICLE CHARACTERIZATION REPORT

2024/04/02
16:38

MEASUREMENT DATA

1

UID#	: 001712068303
Customer ID	: Customer
Operator	: 1 / user
Sample name	: Testmeasurement-1000-4-Set1
Measurement#	: 1 / 1
Timestamp	: 2024-04-02T14:38:06Z
Device Serial#	: BR-BM-2-1-A2

2

Measurement duration	: 5min 0sec
Measurement validity	: 85.9% of Particles (14.1% / 0.0%)
Measurement profile	: 1000-4-Set1
RefractiveIndex	: 1.59mat,1.33fluid
Dilution	: 1:100
Particle Concentration	: 5.32E+05 #/mL (± 0) [100nm - 1420nm]
Object Concentration	: 3.9E+08 #/mL (± 0)

3

MEASUREMENT RESULT - NUMBER BASED

MEAN		BLOCK	
Dn90	: 679.5nm	**Dn90**	: 674.4nm (±6.5)
Dn50	: 499.7nm	**Dn50**	: 493.7nm (±8.4)
Dn10	: 419.8nm	**Dn10**	: 393.2nm (±33.2)
SPAN	: 0.52	**SPAN**	: 0.57
MODE	: 485.0nm	**MODE**	: 477.0nm
D[4,3]	: 640.5nm	**D[4,3]**	: 643.3nm (±12.2)
D[3,2]	: 597.9nm	**D[3,2]**	: 595.8nm (±7.9)

MEASUREMENT RESULT - VOLUME BASED

MEAN		BLOCK	
Dv90	: 748.7nm	**Dv90**	: 765.2nm (±47.9)
Dv50	: 657.1nm	**Dv50**	: 654.3nm (±6.1)
Dv10	: 469.7nm	**Dv10**	: 468.1nm (±5.1)
SPAN	: 0.42	**SPAN**	: 0.45
MODE	: 675.0nm	**MODE**	: 671.0nm
Particle #	: 526	**Object #**	: 374

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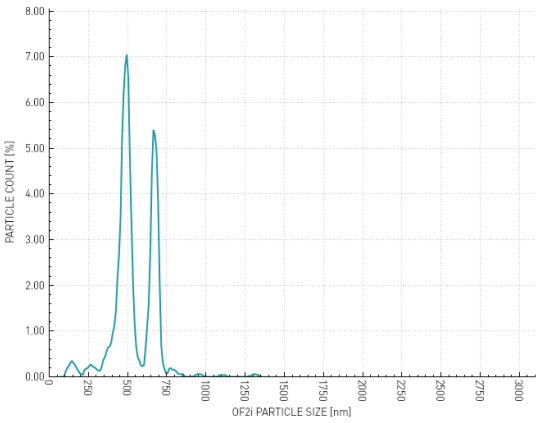
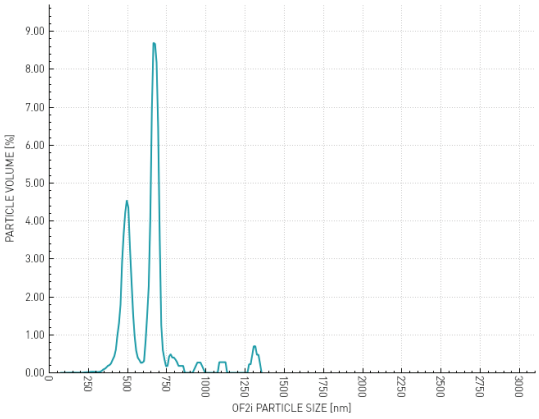
PARTICLE SIZE DISTRIBUTION - NUMBER BASED



PARTICLE SIZE DISTRIBUTION - VOLUME BASED



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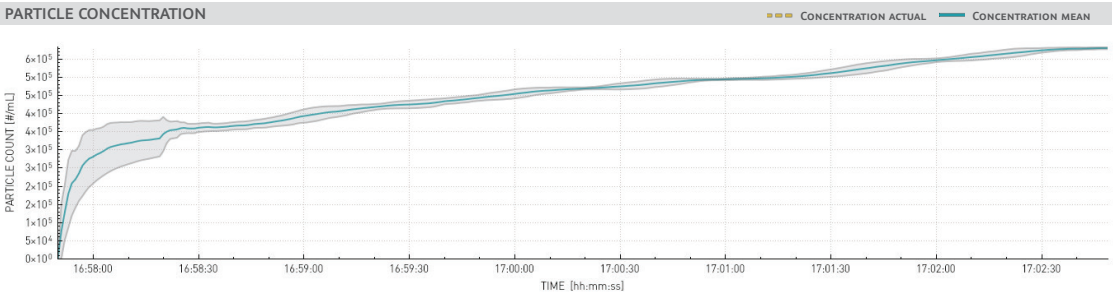
PARTICLE CONCENTRATION



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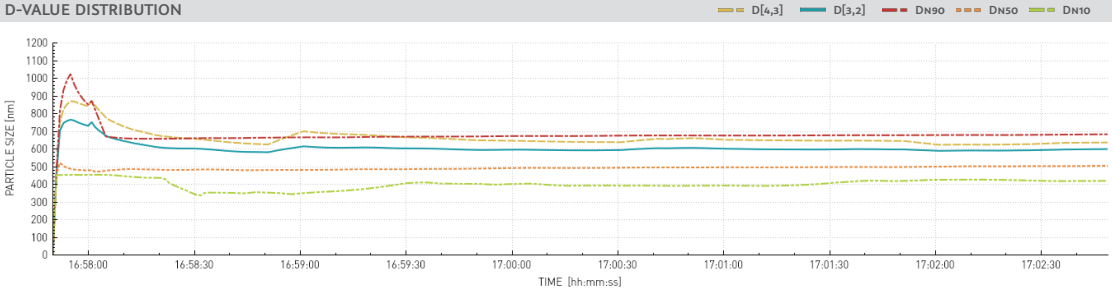
D-VALUE DISTRIBUTION



The measuring report delivers the following information:

(1)

UID#:	a unique number for the measurement on this device
Customer ID:	defined customer name
Operator:	user name of the operator
Sample name:	unique sample description
Measurement#:	in "Static" mode, this is always 1/1
Timestamp:	a UTC (coordinated universal time) time stamp for the measurement
Device Serial#:	device serial number

(2)

Measurement duration:	duration of the measurement
Measurement validity:	% of detected particles in the sizing range - 100 nm to 3000 nm at the moment - (% of particles below the sizing range / % of particles above the sizing range). You can use this to compare samples and evaluate the validity of your measurement. See section 7.1 for an example.
Measurement profile:	the chosen measurement profile
Refractive index:	the value entered for the sample material (mat), fixed refractive index of the fluid (fluid)
Dilution:	the value entered for the dilution of the sample
Particle Concentration:	calculated particle concentration in measured sizing range (standard deviation) [measured particle size range]
Object Concentration:	detected object concentration (standard deviation)

(3)

What is the difference between number-based results and volume-based results?

Number-based measurement:

- Focuses on counting particles of different sizes.
- Useful for understanding the diversity of particle sizes in a sample.

Volume-based measurement:

- Assesses the overall space or mass occupied by particles in a sample.
- Provides insight into the total impact or volume of particles in a sample.

See (4) for a comparison of number-based and volume-based graphs

Mean D-Values:	The mean D-Values given on the report are listed as Dn or Dv-Values (the „n" stands for number; „v" for volume). The mean is calculated over the whole measurement duration.
Block D-Values:	To track the development of the values over time, H.A.N.S. records the measured D-Values in blocks of time. The duration of one block is set as 1 minute. The given block value is the mean of the measured blocks. To get a standard deviation you need to measure for a minimum 2 minutes (2 blocks). The standard deviation is given ± in parentheses.
SPAN:	The "SPAN" value gives insight into the width of the particle size distribution and depends on the sample properties. It is calculated by (D90-D10)/D50.
D[4,3]:	Volume or mass moment mean - De Brouckere mean diameter [nm]

$$D[4,3] = \frac{\sum d^4}{\sum d^3}$$

D[3,2]: Surface area moment mean – Sauter mean diameter [nm]

$$D[3,2] = \frac{\sum d^3}{\sum d^2}$$

Particle #:	The particle count is given for the whole measurement duration.
Object #:	The object count is given for the whole measurement duration.

(4)

What is the difference between Particle Size Distribution (number-based) and volume-based graphs?

Different particle size distribution calculations use different weightings. In number-based data each particle is weighted the same, independent of the actual size of the particle. In volume-based data the larger the volume of the particle the higher the weighting of the particle.

(5)

Particle concentration graph

The graph shows the particle concentration over time and includes a standard deviation (gray field). At the start of the measurement there is not enough data collected to make the calculation relevant, this is why the standard deviation is wide. We recommend to discard the values in the first 30 seconds of the curve.

(6)

D-Value Distribution graph

The graph shows the D-Values measured over time.