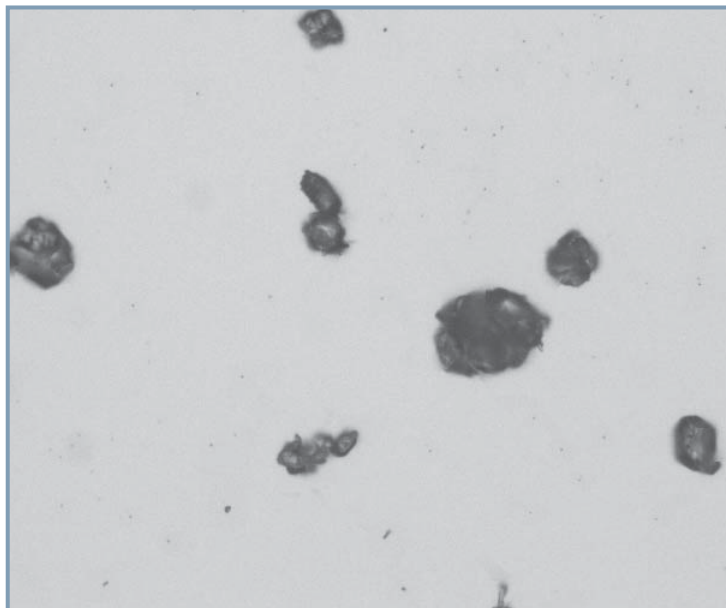


CLEMEX
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Particle Size Analysis



Prepared by Myriam Savard Eng.
Clemex Technologies Inc.
For Prosonix

Sample Description

Two paracetamol powder samples were submitted for analysis. One sample was dry powder and the other one was in liquid.

Purpose of Analysis

To demonstrate that the Clemex Vision image analysis system can isolate and perform size and shape measurements over each particle.

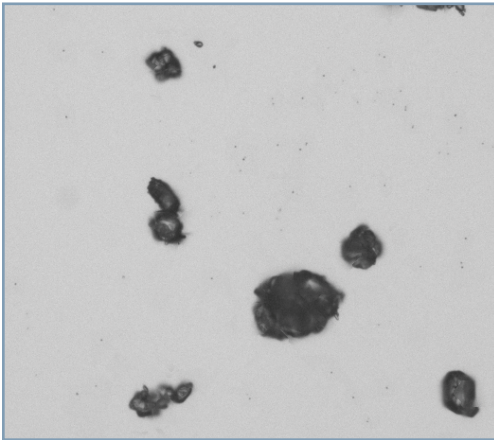


Figure 1: Part of the original image (0.6227 microns/pixel).

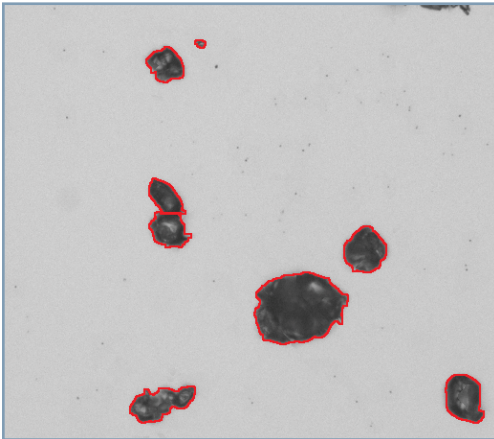


Figure 2: Outline view of particles as measured in red bitplane.

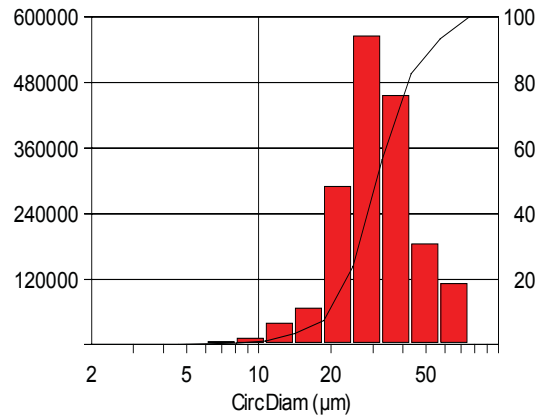
Procedure¹

Fibers are binarized in red using the Contrast Thresholding tool. Connected particles are transferred from red to green bitplane and a separation filter is applied on them. Features that remained connected (roughest ones) are eliminated from the green bitplane before putting them back with the red ones. Small artifacts and particles sectioned by the field of view, are eliminated from the red bitplane prior to measurement.

1 Images taken during the procedure are available in appendix A

Results²

Area, Length, Circular Diameter, Roundness, Aspect Ratio, Width and Volume measurements are performed on each feature. Automated statistics and graphs are generated and cumulated for the whole analysis. Final results can be printed directly from Clemex Vision and saved for further use. Raw data is linked to their respective objects for validation purposes. Raw data could also be exported in Excel format.



Minimum: 3.4 microns
Maximum: 60.7 microns
Mean: 33.6 microns
Std Dev.: 12.2 microns

Figure 3: Particles' Diameter distribution against Volume and corresponding statistics.

Equipment

Image Analysis System:	Clemex Vision PE
Microscope:	Leica DM LA
Objective/Magnification:	20x / 200x
Illumination:	Transmitted Light
Calibration:	0.622665 microns/pixel
Camera:	Clemex L 2.1M Mid-Res
Motorized Stage:	Marzhauser EK32IM 75x50mm
Stage Controller:	Clemex ST-2000
Disperser:	Clemex Powder Disperser 5.0

Discussion

The main problem was to obtain a nice dispersion of the dry powder over a slide. The problem was easily overcome by using the Clemex Powder Disperser.

The analysis itself was straightforward and results are reproducible.

2 Complete results are available in appendix B.



Appendix A: Image Analysis Steps



Image Analysis Steps

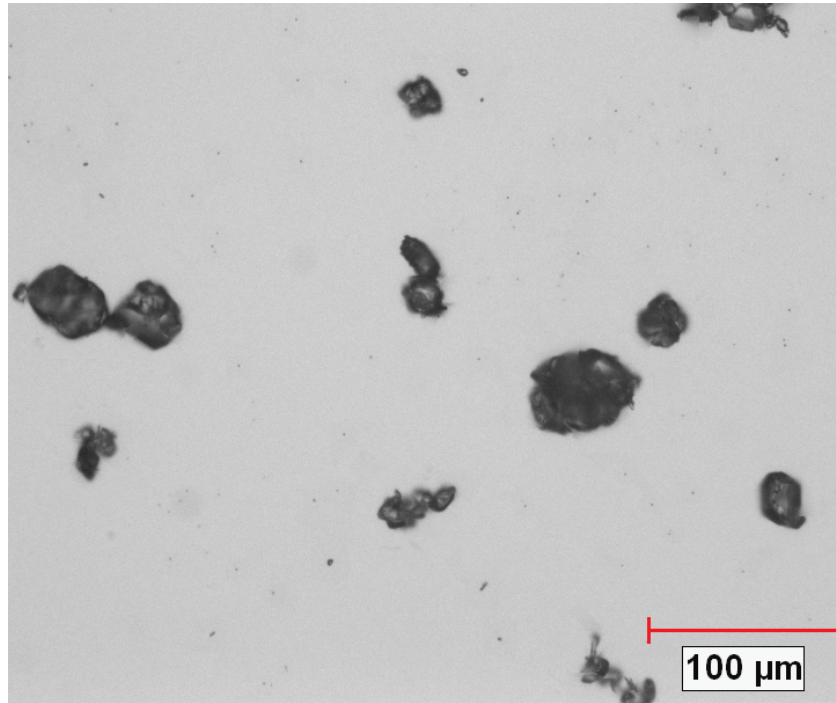


Image 1: Original image showing particles as dispersed on a slide (200x, 0.6227 micron / pixel)

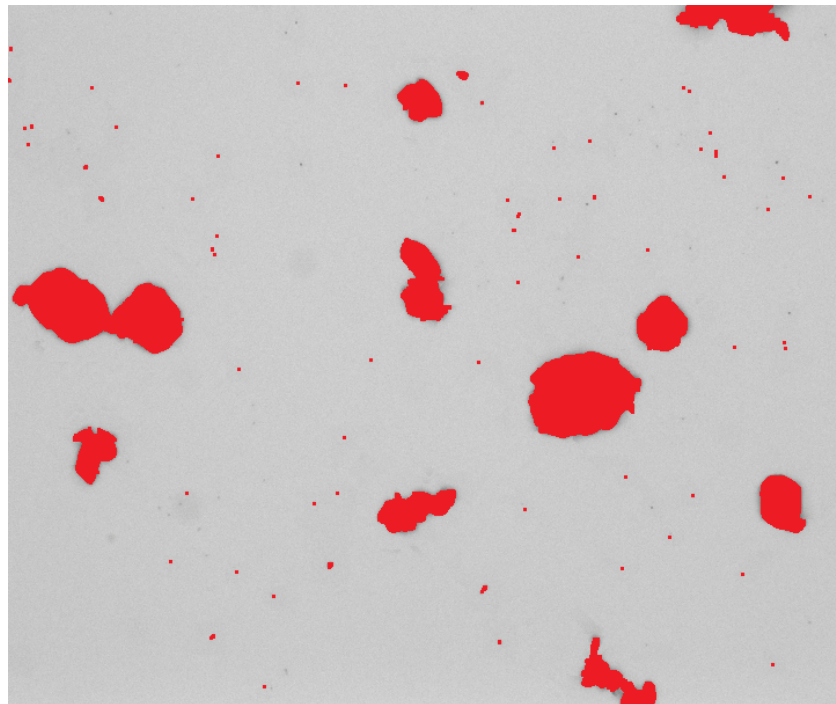


Image 2: Particles as binarized in red using the Contrast Tresholding tool.

Image Analysis Steps

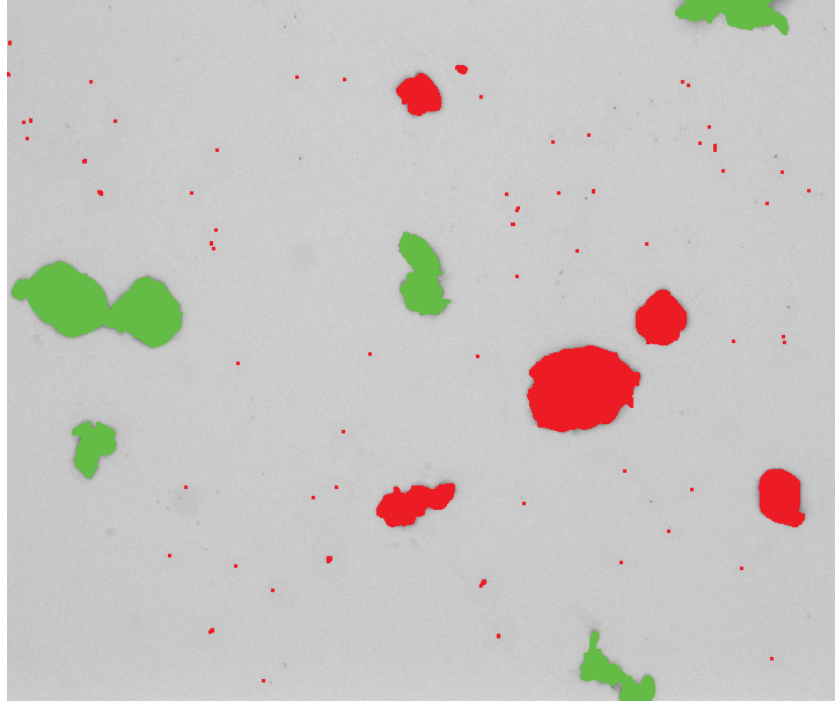


Image 3: Possibly connected particles as isolated into the green bitplane using an object transfer filter based on roughness.

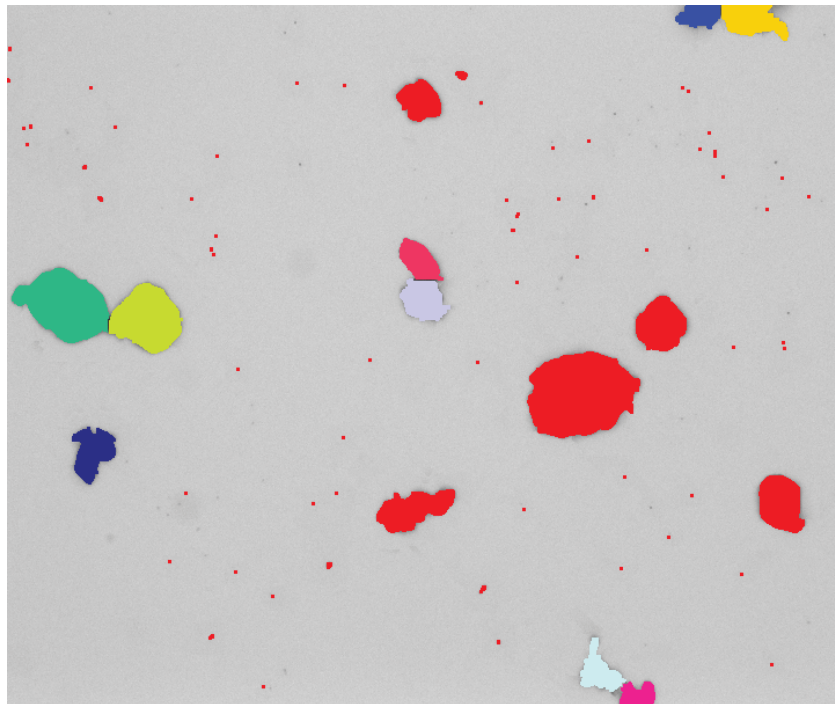


Image 4: Connected particles were disconnected using the Separate instruction. The green bitplane is shown in labeling view attributing a different color to each discrete feature.

Image Analysis Steps

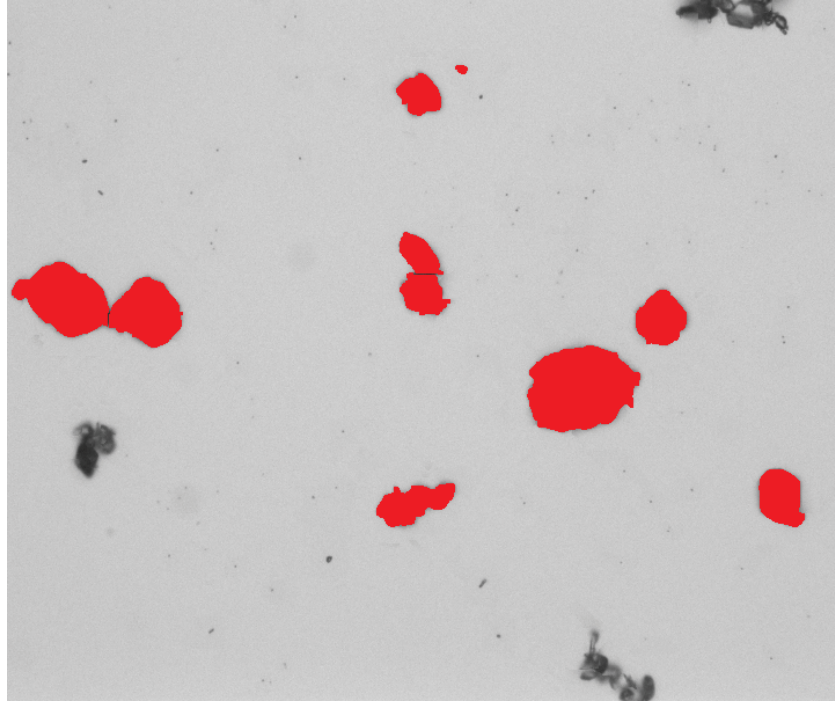


Image 5: Remaining rough (connected) features are eliminated from the green bitplane before putting them back together with the red ones. Small artifacts and features sectioned by the field of view are eliminated prior to measurement.

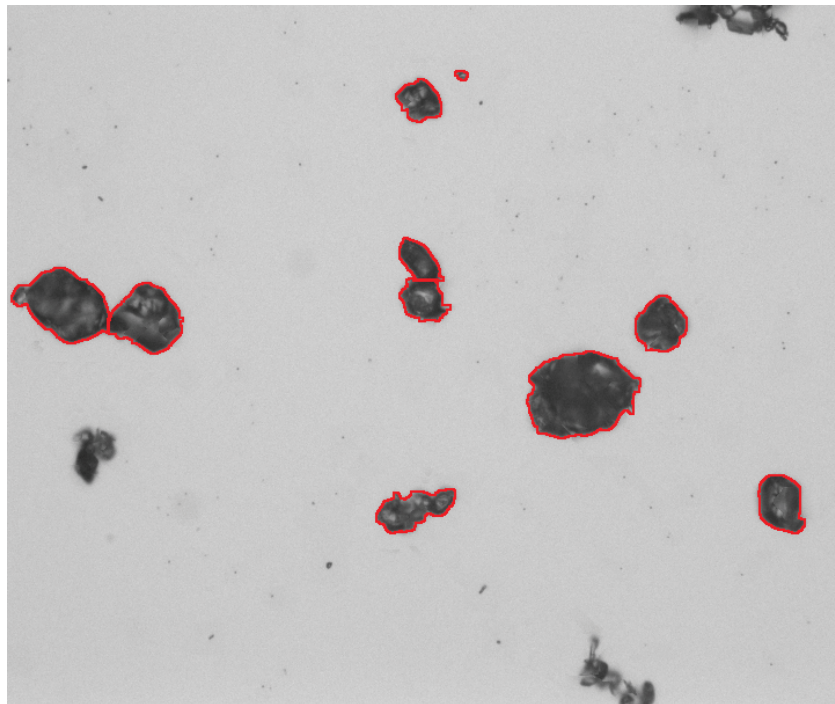


Image 6: Same as previous but in outline view mode allowing to see the original image and the separations.



Appendix B: Results



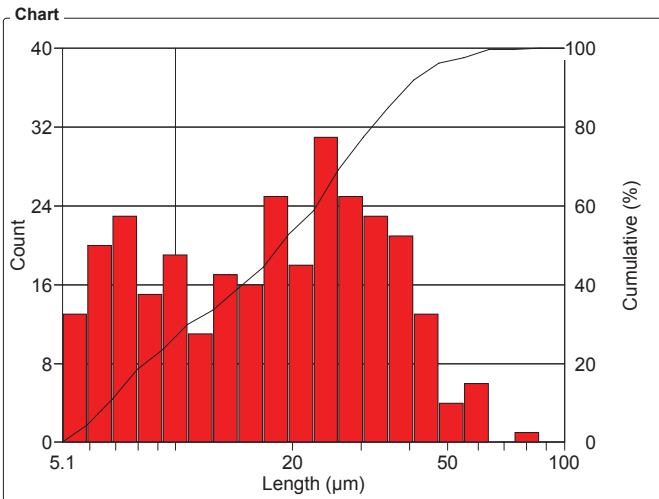
Sample # 1 - Dry Powder

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:22:27 AM**
 Sample:

OBJM1 Count - Length

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

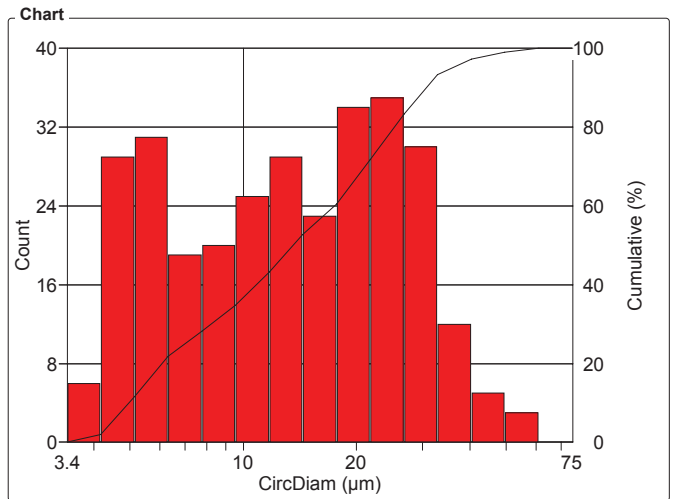


Length Intervals (µm)	Count	%	Cumul%
5.1 - 5.9	13	4.32	4.32
5.9 - 6.9	20	6.64	10.96
6.9 - 8	23	7.64	18.60
8 - 9.2	15	4.98	23.59
9.2 - 10.7	19	6.31	29.90
10.7 - 12.5	11	3.65	33.55
12.5 - 14.5	17	5.65	39.20
14.5 - 16.8	16	5.32	44.52
16.8 - 19.5	25	8.31	52.82
19.5 - 22.6	18	5.98	58.80
22.6 - 26.2	31	10.30	69.10
26.2 - 30.4	25	8.31	77.41
30.4 - 35.3	23	7.64	85.05
35.3 - 41	21	6.98	92.03
41 - 47.5	13	4.32	96.35
47.5 - 55.1	4	1.33	97.67
55.1 - 64	6	1.99	99.67
64 - 74	0	0	99.67
74 - 86	1	0.33	100
86 - 100	0	0	100

Statistics	
Minimum:	5.1 µm
Maximum:	85.7 µm
Mean:	21.0 µm
Std Dev.:	13.3 µm
Sum:	6331.3 µm
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 µm ²
Total Area:	3759252.7 µm ²

OBJM1 Count - CircDiam

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



CircDiam Intervals (µm)	Count	%	Cumul%
3.4 - 4.2	6	1.99	1.99
4.2 - 5.1	29	9.63	11.63
5.1 - 6.3	31	10.30	21.93
6.3 - 7.8	19	6.31	28.24
7.8 - 9.5	20	6.64	34.88
9.5 - 11.7	25	8.31	43.19
11.7 - 14.4	29	9.63	52.82
14.4 - 17.7	23	7.64	60.47
17.7 - 21.8	34	11.30	71.76
21.8 - 26.7	35	11.63	83.39
26.7 - 32.9	30	9.97	93.36
32.9 - 40.4	12	3.99	97.34
40.4 - 50	5	1.66	99.00
50 - 61	3	1.00	100
61 - 75	0	0	100

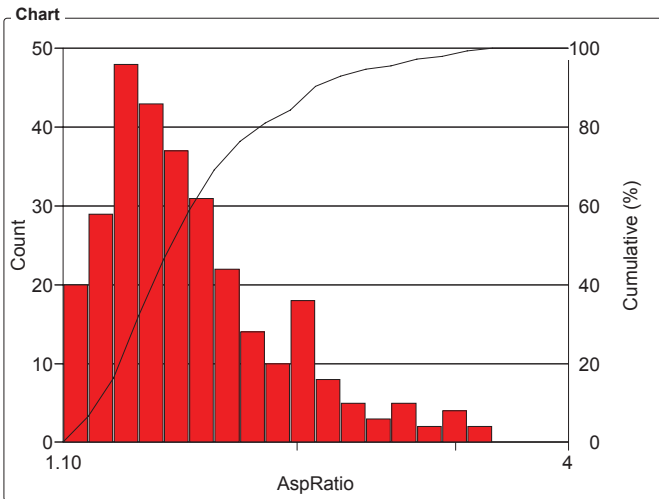
Statistics	
Minimum:	3.4 µm
Maximum:	60.7 µm
Mean:	16.3 µm
Std Dev.:	10.6 µm
Sum:	4900.8 µm
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 µm ²
Total Area:	3759252.7 µm ²

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:22:27 AM**
 Sample:

OBJM1 Count - AspRatio

Magn.: 200xT Calib.: 0.6227 $\mu\text{m}/\text{pixel}$ Bitplane: Bitplane 2



Values

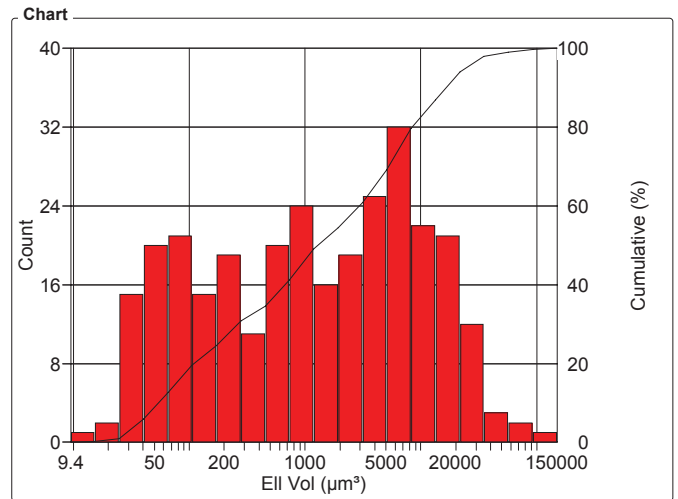
AspRatio Intervals	Count	%	Cumul%
1.10 - 1.17	20	6.64	6.64
1.17 - 1.25	29	9.63	16.28
1.25 - 1.34	48	15.95	32.23
1.34 - 1.42	43	14.29	46.51
1.42 - 1.52	37	12.29	58.80
1.52 - 1.62	31	10.30	69.10
1.62 - 1.73	22	7.31	76.41
1.73 - 1.84	14	4.65	81.06
1.84 - 1.97	10	3.32	84.39
1.97 - 2.10	18	5.98	90.37
2.10 - 2.24	8	2.66	93.02
2.24 - 2.39	5	1.66	94.68
2.39 - 2.55	3	1.00	95.68
2.55 - 2.72	5	1.66	97.34
2.72 - 2.90	2	0.66	98.01
2.90 - 3.09	4	1.33	99.34
3.09 - 3.30	2	0.66	100
3.30 - 3.52	0	0	100
3.52 - 3.75	0	0	100
3.75 - 4	0	0	100

Statistics

Minimum:	1.10
Maximum:	3.22
Mean:	1.57
Std Dev.:	0.400
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 μm^2
Total Area:	3759252.7 μm^2

OBJM1 Count - Ell Vol

Magn.: 200xT Calib.: 0.6227 $\mu\text{m}/\text{pixel}$ Bitplane: Bitplane 2



Values

Ell Vol Intervals (μm^3)	Count	%	Cumul%
9.4 - 15.3	1	0.33	0.33
15.3 - 25	2	0.66	1.00
25 - 40	15	4.98	5.98
40 - 65	20	6.64	12.62
65 - 106	21	6.98	19.60
106 - 171	15	4.98	24.58
171 - 278	19	6.31	30.90
278 - 451	11	3.65	34.55
451 - 732	20	6.64	41.20
732 - 1187	24	7.97	49.17
1187 - 1926	16	5.32	54.49
1926 - 3125	19	6.31	60.80
3125 - 5071	25	8.31	69.10
5071 - 8226	32	10.63	79.73
8226 - 13346	22	7.31	87.04
13346 - 21652	21	6.98	94.02
21652 - 35127	12	3.99	98.01
35127 - 56990	3	1.00	99.00
56990 - 92458	2	0.66	99.67
92458 - 150000	1	0.33	100

Statistics

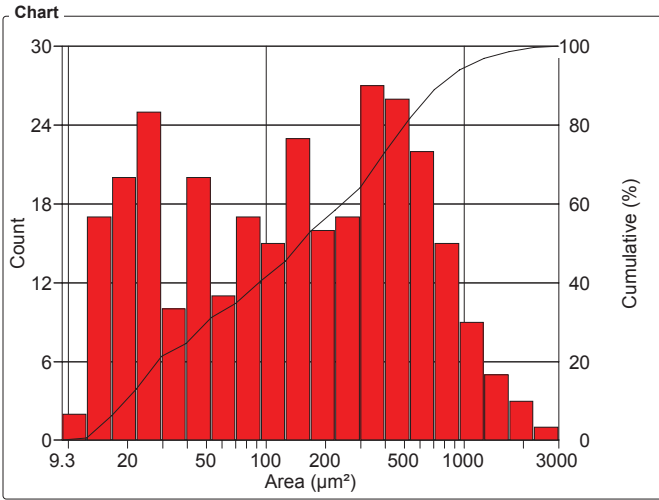
Minimum:	9.4 μm^3
Maximum:	112383.2 μm^3
Mean:	5766.7 μm^3
Std Dev.:	11208.4 μm^3
Sum:	1735788.9 μm^3
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 μm^2
Total Area:	3759252.7 μm^2

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:22:27 AM**
 Sample:

OBJM1 Count - Area

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

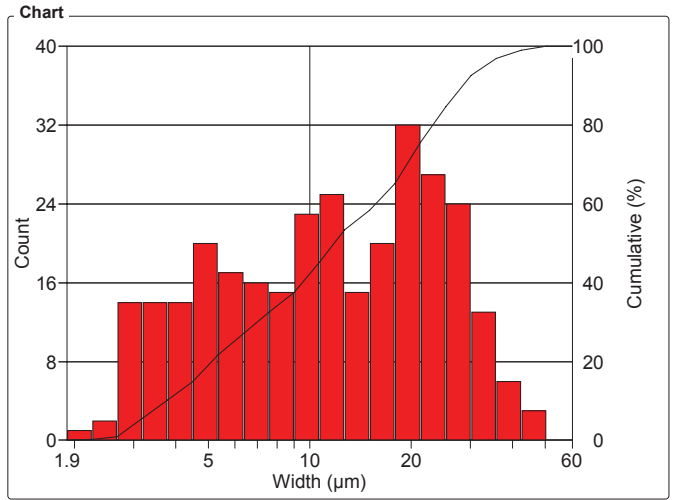


Area Intervals (µm²)	Count	%	Cumul%
9.3 - 12.4	2	0.66	0.66
12.4 - 16.6	17	5.65	6.31
16.6 - 22.1	20	6.64	12.96
22.1 - 29.5	25	8.31	21.26
29.5 - 39	10	3.32	24.58
39 - 53	20	6.64	31.23
53 - 70	11	3.65	34.88
70 - 94	17	5.65	40.53
94 - 125	15	4.98	45.51
125 - 167	23	7.64	53.16
167 - 223	16	5.32	58.47
223 - 298	17	5.65	64.12
298 - 397	27	8.97	73.09
397 - 530	26	8.64	81.73
530 - 708	22	7.31	89.04
708 - 945	15	4.98	94.02
945 - 1261	9	2.99	97.01
1261 - 1684	5	1.66	98.67
1684 - 2247	3	1.00	99.67
2247 - 3000	1	0.33	100

Statistics		
Minimum:	9.3	µm²
Maximum:	2894.7	µm²
Mean:	296.1	µm²
Std Dev.:	378.0	µm²
Sum:	89129.9	µm²
Count:	301	
Under:	0	
Over:	0	
Accepted:	100	%
Field Count:	20	
Field Area:	187962.6	µm²
Total Area:	3759252.7	µm²

OBJM1 Count - Width

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



Width Intervals (µm)	Count	%	Cumul%
1.9 - 2.3	1	0.33	0.33
2.3 - 2.7	2	0.66	1.00
2.7 - 3.2	14	4.65	5.65
3.2 - 3.8	14	4.65	10.30
3.8 - 4.5	14	4.65	14.95
4.5 - 5.4	20	6.64	21.59
5.4 - 6.4	17	5.65	27.24
6.4 - 7.6	16	5.32	32.56
7.6 - 9	15	4.98	37.54
9 - 10.7	23	7.64	45.18
10.7 - 12.7	25	8.31	53.49
12.7 - 15.1	15	4.98	58.47
15.1 - 17.9	20	6.64	65.12
17.9 - 21.3	32	10.63	75.75
21.3 - 25.3	27	8.97	84.72
25.3 - 30.1	24	7.97	92.69
30.1 - 35.7	13	4.32	97.01
35.7 - 42.5	6	1.99	99.00
42.5 - 50.5	3	1.00	100
50.5 - 60	0	0	100

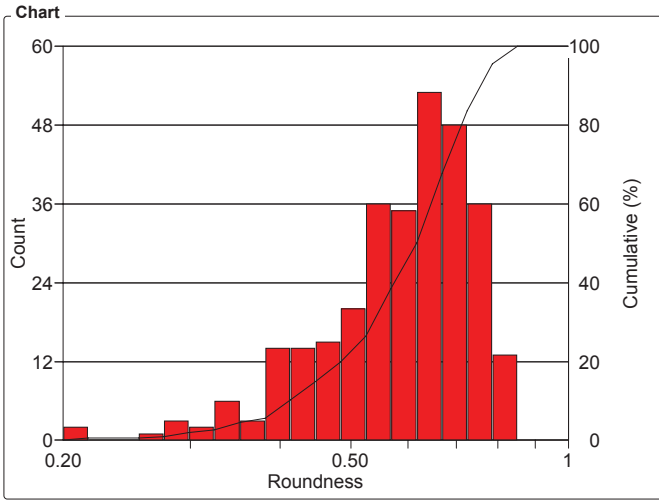
Statistics		
Minimum:	1.9	µm
Maximum:	50.0	µm
Mean:	14.4	µm
Std Dev.:	9.76	µm
Sum:	4342.1	µm
Count:	301	
Under:	0	
Over:	0	
Accepted:	100	%
Field Count:	20	
Field Area:	187962.6	µm²
Total Area:	3759252.7	µm²

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:22:27 AM**
 Sample:

OBJM1 Count - Roundness

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

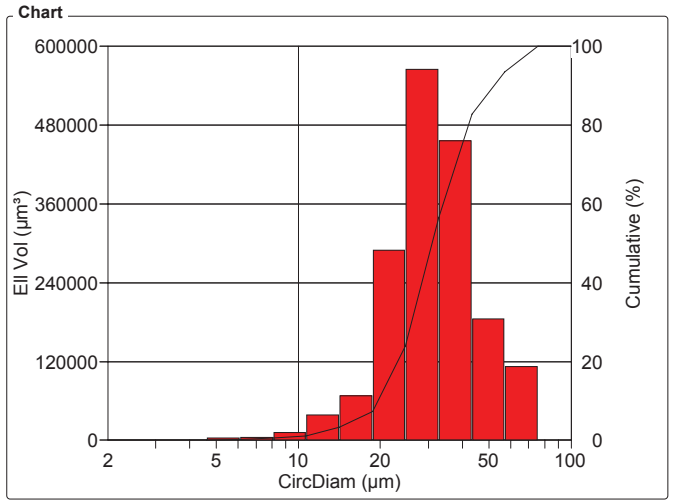


Roundness Intervals	Count	%	Cumul%
0.20 - 0.22	2	0.66	0.66
0.22 - 0.23	0	0	0.66
0.23 - 0.25	0	0	0.66
0.25 - 0.28	1	0.33	1.00
0.28 - 0.30	3	1.00	1.99
0.30 - 0.32	2	0.66	2.66
0.32 - 0.35	6	1.99	4.65
0.35 - 0.38	3	1.00	5.65
0.38 - 0.41	14	4.65	10.30
0.41 - 0.45	14	4.65	14.95
0.45 - 0.49	15	4.98	19.93
0.49 - 0.52	20	6.64	26.58
0.52 - 0.57	36	11.96	38.54
0.57 - 0.62	35	11.63	50.17
0.62 - 0.67	53	17.61	67.77
0.67 - 0.73	48	15.95	83.72
0.73 - 0.79	36	11.96	95.68
0.79 - 0.85	13	4.32	100
0.85 - 0.92	0	0	100
0.92 - 1	0	0	100

Statistics	
Minimum:	0.21
Maximum:	0.84
Mean:	0.597
Std Dev.:	0.129
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 µm²
Total Area:	3759252.7 µm²

OBJM1 Ell Vol - CircDiam

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



CircDiam Intervals (µm)	Ell Vol (µm³)	%	Cumul%
2 - 2.6	0	0	0
2.6 - 3.5	9.4	540.71e-06	540.71e-06
3.5 - 4.6	586.1	0.03	0.03
4.6 - 6.1	3354.2	0.19	0.23
6.1 - 8.1	5081.6	0.29	0.52
8.1 - 10.7	11525.4	0.66	1.18
10.7 - 14.1	38963.1	2.24	3.43
14.1 - 18.7	67357.5	3.88	7.31
18.7 - 24.7	289405.9	16.67	23.98
24.7 - 33	565152.1	32.56	56.54
33 - 43	456722.4	26.31	82.85
43 - 57	185248.0	10.67	93.53
57 - 76	112383.2	6.47	100
76 - 100	0	0	100

Statistics	
Minimum:	3.4 µm
Maximum:	60.7 µm
Mean:	33.6 µm
Std Dev.:	12.2 µm
Sum:	58.3e+06 µm
Count:	301
Under:	0
Over:	0
Accepted:	100 %
Field Count:	20
Field Area:	187962.6 µm²
Total Area:	3759252.7 µm²

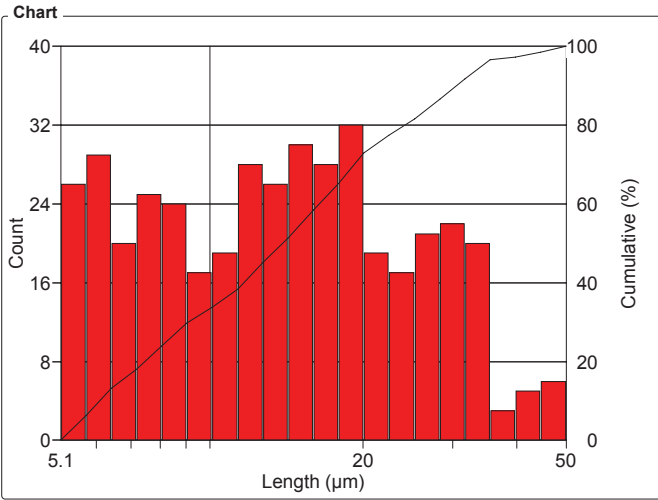
Sample # 2 - Particles in Liquid

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:07:50 AM**
 Sample:

OBJM1 Count - Length

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

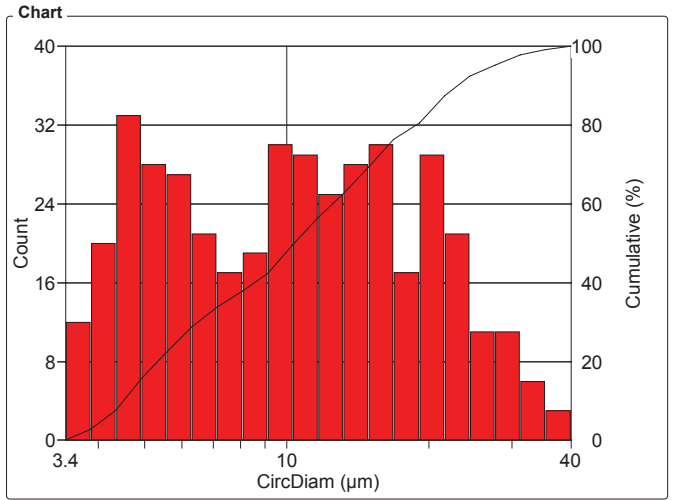


Length Intervals (µm)	Count	%	Cumul%
5.1 - 5.7	26	6.24	6.24
5.7 - 6.4	29	6.95	13.19
6.4 - 7.2	20	4.80	17.99
7.2 - 8.1	25	6.00	23.98
8.1 - 9	24	5.76	29.74
9 - 10.1	17	4.08	33.81
10.1 - 11.3	19	4.56	38.37
11.3 - 12.7	28	6.71	45.08
12.7 - 14.2	26	6.24	51.32
14.2 - 16	30	7.19	58.51
16 - 17.9	28	6.71	65.23
17.9 - 20.1	32	7.67	72.90
20.1 - 22.5	19	4.56	77.46
22.5 - 25.2	17	4.08	81.53
25.2 - 28.3	21	5.04	86.57
28.3 - 31.7	22	5.28	91.85
31.7 - 35.5	20	4.80	96.64
35.5 - 39.8	3	0.72	97.36
39.8 - 44.6	5	1.20	98.56
44.6 - 50	6	1.44	100

Statistics	
Minimum:	5.1 µm
Maximum:	48.6 µm
Mean:	16.1 µm
Std Dev.:	9.51 µm
Sum:	6722.1 µm
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm ²
Total Area:	3947215.4 µm ²

OBJM1 Count - CircDiam

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



CircDiam Intervals (µm)	Count	%	Cumul%
3.4 - 3.8	12	2.88	2.88
3.8 - 4.3	20	4.80	7.67
4.3 - 4.9	33	7.91	15.59
4.9 - 5.6	28	6.71	22.30
5.6 - 6.3	27	6.47	28.78
6.3 - 7.1	21	5.04	33.81
7.1 - 8.1	17	4.08	37.89
8.1 - 9.1	19	4.56	42.45
9.1 - 10.3	30	7.19	49.64
10.3 - 11.7	29	6.95	56.59
11.7 - 13.2	25	6.00	62.59
13.2 - 14.9	28	6.71	69.30
14.9 - 16.9	30	7.19	76.50
16.9 - 19.1	17	4.08	80.58
19.1 - 21.6	29	6.95	87.53
21.6 - 24.4	21	5.04	92.57
24.4 - 27.6	11	2.64	95.20
27.6 - 31.3	11	2.64	97.84
31.3 - 35.4	6	1.44	99.28
35.4 - 40	3	0.72	100

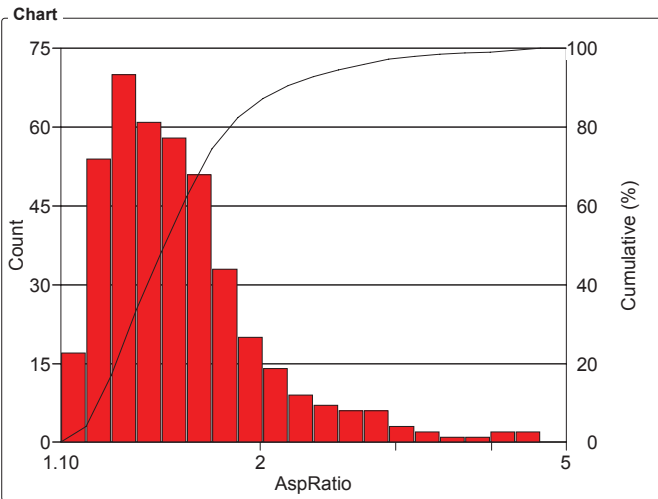
Statistics	
Minimum:	3.4 µm
Maximum:	36.3 µm
Mean:	12.2 µm
Std Dev.:	7.41 µm
Sum:	5095.8 µm
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm ²
Total Area:	3947215.4 µm ²

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:07:50 AM**
 Sample:

OBJM1 Count - AspRatio

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

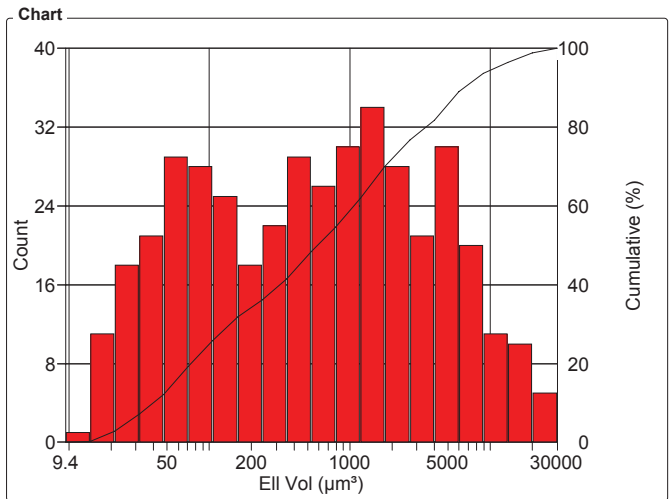


AspRatio Intervals	Count	%	Cumul%
1.10 - 1.19	17	4.08	4.08
1.19 - 1.28	54	12.95	17.03
1.28 - 1.38	70	16.79	33.81
1.38 - 1.49	61	14.63	48.44
1.49 - 1.61	58	13.91	62.35
1.61 - 1.73	51	12.23	74.58
1.73 - 1.87	33	7.91	82.49
1.87 - 2.02	20	4.80	87.29
2.02 - 2.17	14	3.36	90.65
2.17 - 2.35	9	2.16	92.81
2.35 - 2.53	7	1.68	94.48
2.53 - 2.73	6	1.44	95.92
2.73 - 2.94	6	1.44	97.36
2.94 - 3.17	3	0.72	98.08
3.17 - 3.42	2	0.48	98.56
3.42 - 3.69	1	0.24	98.80
3.69 - 3.98	1	0.24	99.04
3.98 - 4.30	2	0.48	99.52
4.30 - 4.64	2	0.48	100
4.64 - 5	0	0	100

Statistics	
Minimum:	1.07
Maximum:	4.38
Mean:	1.63
Std Dev.:	0.482
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm ²
Total Area:	3947215.4 µm ²

OBJM1 Count - Ell Vol

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



Ell Vol Intervals (µm³)	Count	%	Cumul%
9.4 - 14.1	1	0.24	0.24
14.1 - 21	11	2.64	2.88
21 - 32	18	4.32	7.19
32 - 47	21	5.04	12.23
47 - 71	29	6.95	19.18
71 - 106	28	6.71	25.90
106 - 158	25	6.00	31.89
158 - 237	18	4.32	36.21
237 - 355	22	5.28	41.49
355 - 531	29	6.95	48.44
531 - 795	26	6.24	54.68
795 - 1190	30	7.19	61.87
1190 - 1781	34	8.15	70.02
1781 - 2666	28	6.71	76.74
2666 - 3991	21	5.04	81.77
3991 - 5975	30	7.19	88.97
5975 - 8944	20	4.80	93.76
8944 - 13388	11	2.64	96.40
13388 - 20041	10	2.40	98.80
20041 - 30000	5	1.20	100

Statistics	
Minimum:	9.4 µm ³
Maximum:	28555.5 µm ³
Mean:	2296.6 µm ³
Std Dev.:	4174.6 µm ³
Sum:	957672.4 µm ³
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm ²
Total Area:	3947215.4 µm ²

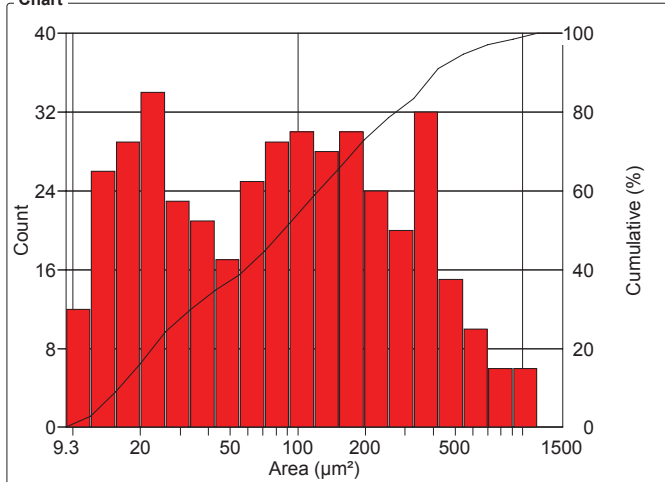
Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:07:50 AM**
 Sample:

OBJM1 Count - Area

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

Chart



Values

Area Intervals (µm²)	Count	%	Cumul%
9.3 - 12	12	2.88	2.88
12 - 15.5	26	6.24	9.11
15.5 - 19.9	29	6.95	16.07
19.9 - 25.7	34	8.15	24.22
25.7 - 33.1	23	5.52	29.74
33.1 - 43	21	5.04	34.77
43 - 55	17	4.08	38.85
55 - 71	25	6.00	44.84
71 - 92	29	6.95	51.80
92 - 118	30	7.19	58.99
118 - 152	28	6.71	65.71
152 - 196	30	7.19	72.90
196 - 253	24	5.76	78.66
253 - 326	20	4.80	83.45
326 - 421	32	7.67	91.13
421 - 543	15	3.60	94.72
543 - 700	10	2.40	97.12
700 - 902	6	1.44	98.56
902 - 1163	6	1.44	100
1163 - 1500	0	0	100

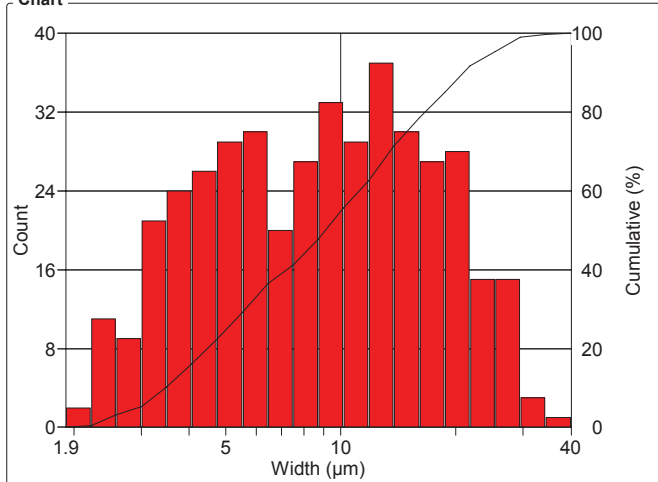
Statistics

Minimum:	9.3	µm²
Maximum:	1035.2	µm²
Mean:	160.3	µm²
Std Dev.:	191.7	µm²
Sum:	66844.6	µm²
Count:	417	
Under:	0	
Over:	0	
Accepted:	100	%
Field Count:	21	
Field Area:	187962.6	µm²
Total Area:	3947215.4	µm²

OBJM1 Count - Width

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

Chart



Values

Width Intervals (µm)	Count	%	Cumul%
1.9 - 2.2	2	0.48	0.48
2.2 - 2.6	11	2.64	3.12
2.6 - 3	9	2.16	5.28
3 - 3.5	21	5.04	10.31
3.5 - 4.1	24	5.76	16.07
4.1 - 4.7	26	6.24	22.30
4.7 - 5.5	29	6.95	29.26
5.5 - 6.4	30	7.19	36.45
6.4 - 7.5	20	4.80	41.25
7.5 - 8.7	27	6.47	47.72
8.7 - 10.2	33	7.91	55.64
10.2 - 11.8	29	6.95	62.59
11.8 - 13.8	37	8.87	71.46
13.8 - 16	30	7.19	78.66
16 - 18.7	27	6.47	85.13
18.7 - 21.7	28	6.71	91.85
21.7 - 25.3	15	3.60	95.44
25.3 - 29.5	15	3.60	99.04
29.5 - 34.3	3	0.72	99.76
34.3 - 40	1	0.24	100

Statistics

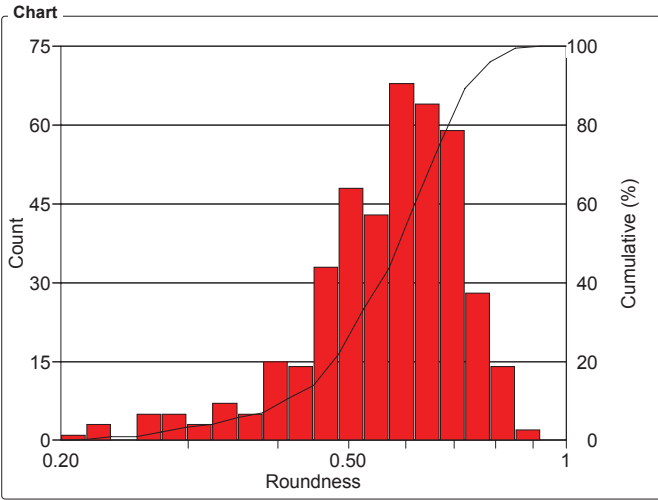
Minimum:	1.9	µm
Maximum:	35.7	µm
Mean:	10.7	µm
Std Dev.:	6.94	µm
Sum:	4468.9	µm
Count:	417	
Under:	0	
Over:	0	
Accepted:	100	%
Field Count:	21	
Field Area:	187962.6	µm²
Total Area:	3947215.4	µm²

Organization: **Clemex**
 Department:
 User: **Myriam Savard**

Date & Time: **06/02/2008 10:07:50 AM**
 Sample:

OBJM1 Count - Roundness

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2

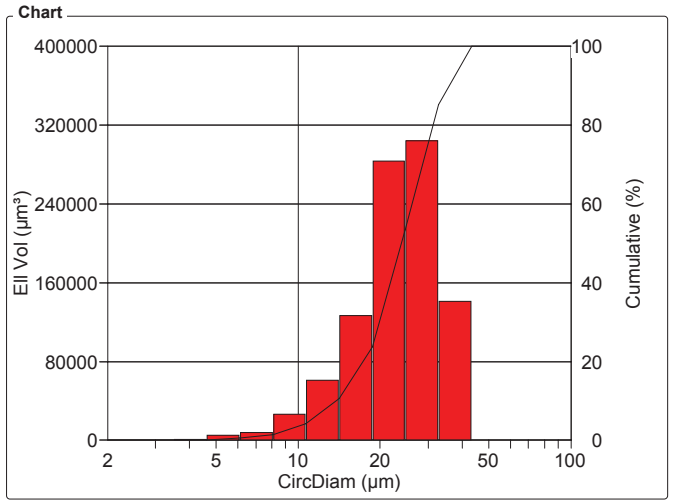


Roundness Intervals	Count	%	Cumul%
0.20 - 0.22	1	0.24	0.24
0.22 - 0.23	3	0.72	0.96
0.23 - 0.25	0	0	0.96
0.25 - 0.28	5	1.20	2.16
0.28 - 0.30	5	1.20	3.36
0.30 - 0.32	3	0.72	4.08
0.32 - 0.35	7	1.68	5.76
0.35 - 0.38	5	1.20	6.96
0.38 - 0.41	15	3.60	10.56
0.41 - 0.45	14	3.36	13.92
0.45 - 0.49	33	7.91	21.83
0.49 - 0.52	48	11.51	33.34
0.52 - 0.57	43	10.31	43.65
0.57 - 0.62	68	16.31	59.96
0.62 - 0.67	64	15.35	75.31
0.67 - 0.73	59	14.15	89.46
0.73 - 0.79	28	6.71	96.17
0.79 - 0.85	14	3.36	99.53
0.85 - 0.92	2	0.48	100
0.92 - 1	0	0	100

Statistics	
Minimum:	0.18
Maximum:	0.87
Mean:	0.576
Std Dev.:	0.127
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm²
Total Area:	3947215.4 µm²

OBJM1 Ell Vol - CircDiam

Magn.: 200xT Calib.: 0.6227 µm/pixel Bitplane: Bitplane 2



CircDiam Intervals (µm)	Ell Vol (µm³)	%	Cumul%
2 - 2.6	0	0	0
2.6 - 3.5	9.4	980.03e-06	980.03e-06
3.5 - 4.6	1323.6	0.14	0.14
4.6 - 6.1	5123.1	0.53	0.67
6.1 - 8.1	7760.6	0.81	1.48
8.1 - 10.7	26438.2	2.76	4.25
10.7 - 14.1	60880.7	6.36	10.60
14.1 - 18.7	126474.6	13.21	23.81
18.7 - 24.7	283450.2	29.60	53.41
24.7 - 33	304639.8	31.81	85.22
33 - 43	141572.3	14.78	100
43 - 57	0	0	100
57 - 76	0	0	100
76 - 100	0	0	100

Statistics	
Minimum:	3.4 µm
Maximum:	36.3 µm
Mean:	24.0 µm
Std Dev.:	7.52 µm
Sum:	22.9e+06 µm
Count:	417
Under:	0
Over:	0
Accepted:	100 %
Field Count:	21
Field Area:	187962.6 µm²
Total Area:	3947215.4 µm²

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