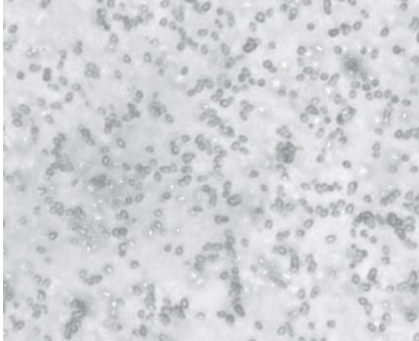
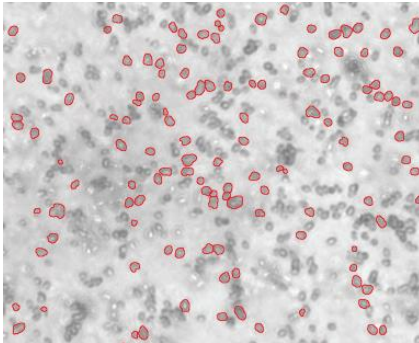


## PARTICLE SIZE ANALYSIS



**Figure 1:** Original image at 400X.



**Figure 2:** Particle's length distribution and corresponding statistics.

### Sample Description

Three bottles of eye drops (ISV-502) were submitted for analysis. One contained the sample mixed with H<sub>2</sub>O, another was mixed with 5% polysorbate and the last one was not diluted. Also, bottles containing the dilution solutions were also available.

### Purpose of Analysis

To demonstrate that the Clemex Vision image analysis system can perform size and shape measurements on these samples.

### Procedure

The particles were binarized in blue using a gray enhancer and the Contrast Thresholding tool. Particles that were connected only by one or two pixels were separated and artifacts were eliminated including features sectioned by the field of view. A first measurement was performed on the remaining particles and agglomerations.

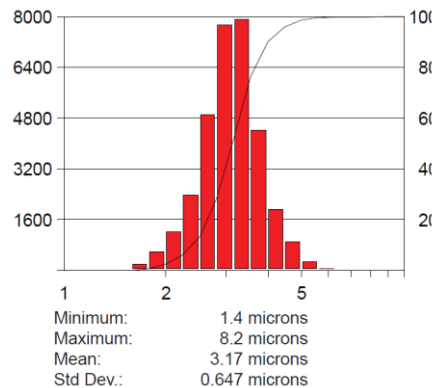
All these features were copied in red and separated further. Only features likely to be composed of a unique particle were kept and a second measurement was performed.

### Equipment

<b>Image Analysis System:</b>	Clemex Vision PE
<b>Microscope:</b>	Leica DM IL with transmitted light 400X
<b>Magnification:</b>	
<b>Stage:</b>	Marzhauser EK321M 100x100 mm
<b>Stage Controller:</b>	Clemex ST-2000
<b>Calibration:</b>	0.1176 microns/pixel
<b>Camera:</b>	Clemex L 1.4M

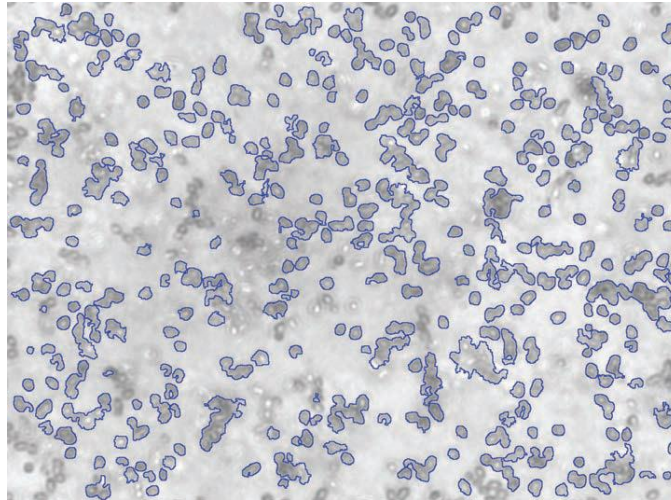
## Results

Length, Circular Diameter, Sphericity, Aspect Ratio, Width and Ellipsoidal Volume measurements are performed on each particle. Automated statistics (including count) and graph are generated and cumulated for the whole analysis. Final results can be printed directly from Clemex Vision. A customized report is built using the Report Generator module. Raw data are linked to their respective objects for validation. Raw data can also be exported in Excel format. Complete results are available in appendix.



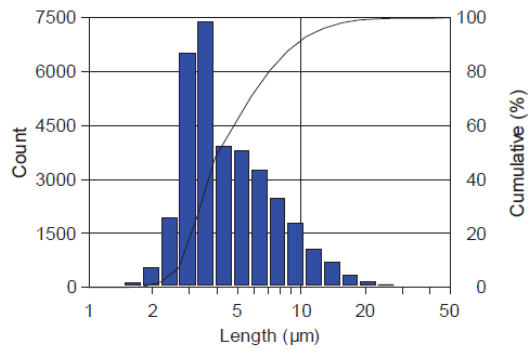
**Figure 3:** Particle's length distribution and corresponding statistics.

**Sample #1 Particles and Agglomerations**  
Particle Size Analysis (Diluted with H<sub>2</sub>O)

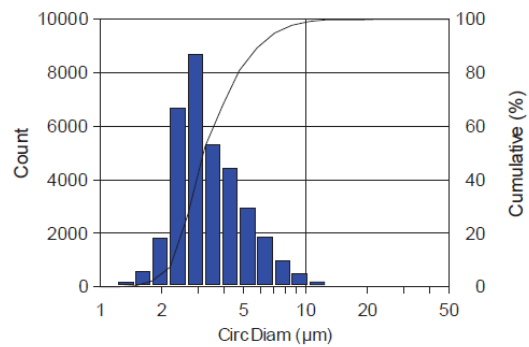


*Figure 4: Typical field of view.*

**Length - Count**

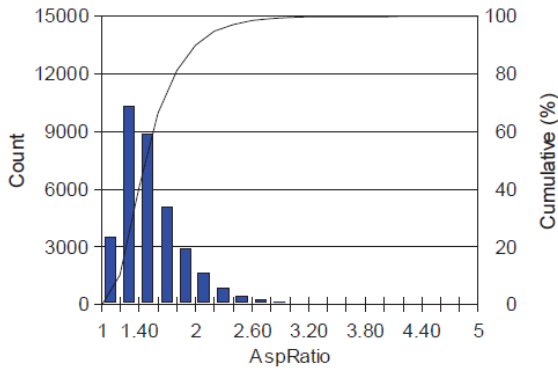


**Diameter - Count**

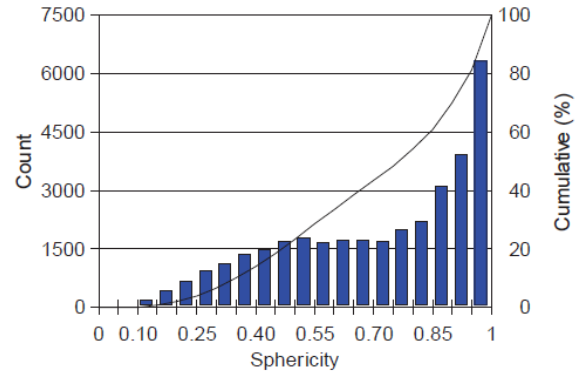


<b>Minimum:</b>	1.4 µm	1.2 µm
<b>Maximum:</b>	43.1 µm	22.3 µm
<b>Mean:</b>	5.27 µm	3.72 µm
<b>Std Dev.:</b>	3.27 µm	1.70 µm
<b>D10:</b>	2.7 µm	2.3 µm
<b>D50:</b>	4.0 µm	3.1 µm
<b>D90:</b>	9.3 µm	5.9 µm

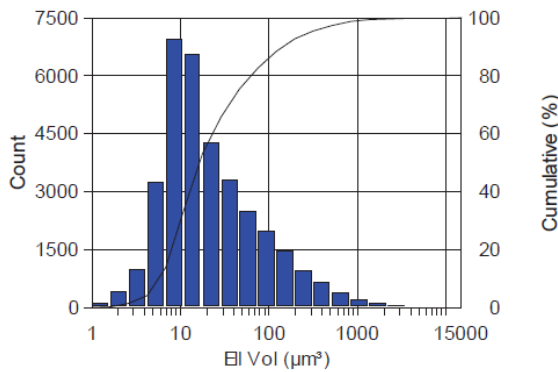
## Particle Size Analysis (Diluted with H2O)

**Aspect Ratio - Count**


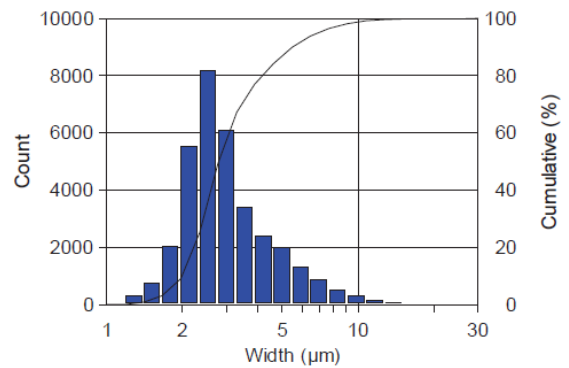
**Minimum:** 1.04  
**Maximum:** 4.10  
**Mean:** 1.54  
**Std Dev.:** 0.34  
**D10:** 1.20  
**D50:** 1.47  
**D90:** 2.00

**Sphericity - Count**


**Minimum:** 0.05  
**Maximum:** 1.00  
**Mean:** 0.71  
**Std Dev.:** 0.24  
**D10:** 0.35  
**D50:** 0.76  
**D90:** 0.98

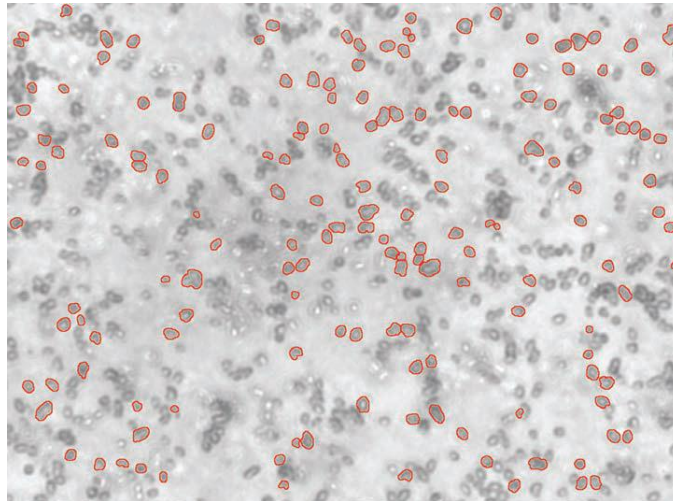
**Volume - Count**


**Minimum:** 1.1 µm<sup>3</sup>  
**Maximum:** 12723.0 µm<sup>3</sup>  
**Mean:** 71.7 µm<sup>3</sup>  
**Std Dev.:** 263.4 µm<sup>3</sup>  
**D10:** 5.9 µm<sup>3</sup>  
**D50:** 16.2 µm<sup>3</sup>  
**D90:** 138.8 µm<sup>3</sup>

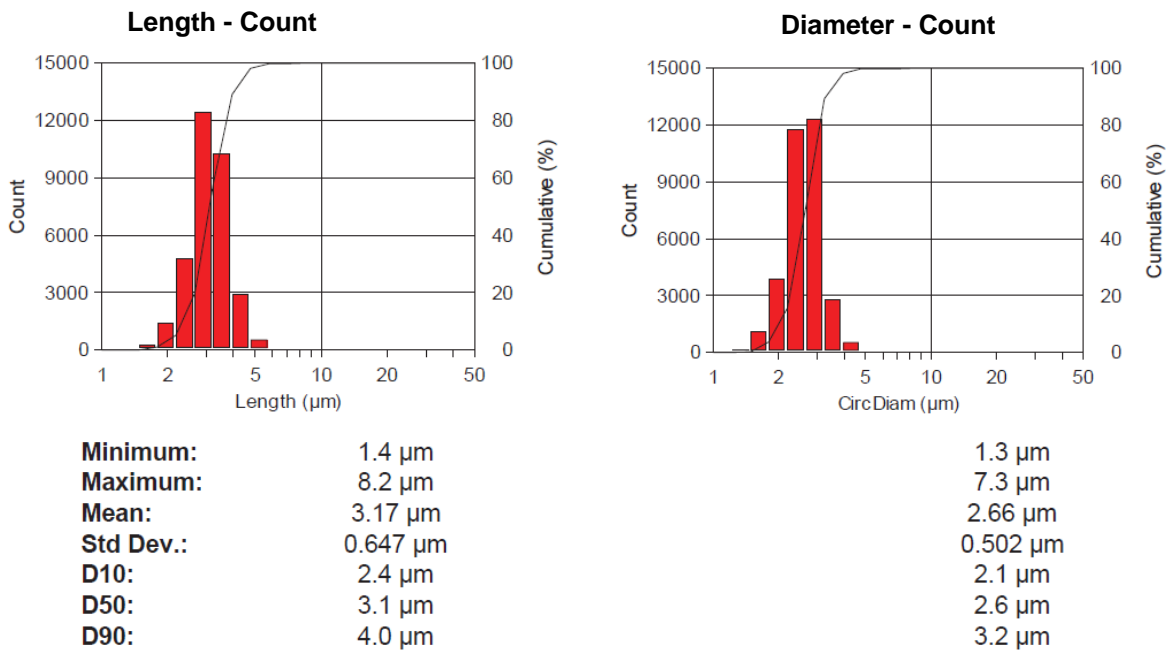
**Width - Count**


**Minimum:** 1.2 µm  
**Maximum:** 25.8 µm  
**Mean:** 3.35 µm  
**Std Dev.:** 1.79 µm  
**D10:** 2.0 µm  
**D50:** 2.8 µm  
**D90:** 5.5 µm

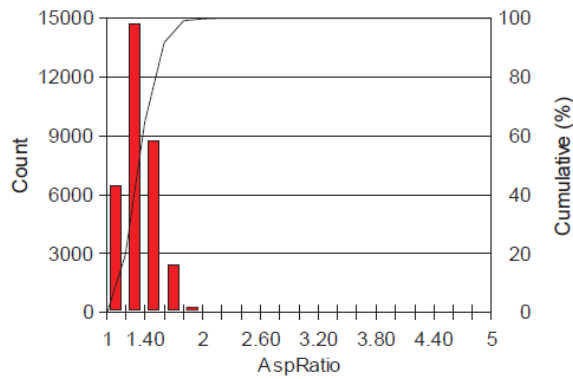
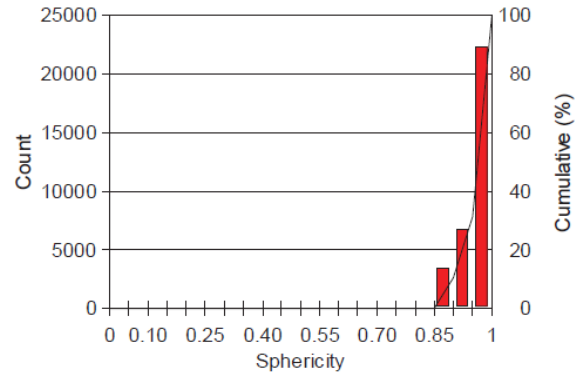
**Sample #1 Particles Only**  
Particle Size Analysis (Diluted with H<sub>2</sub>O)



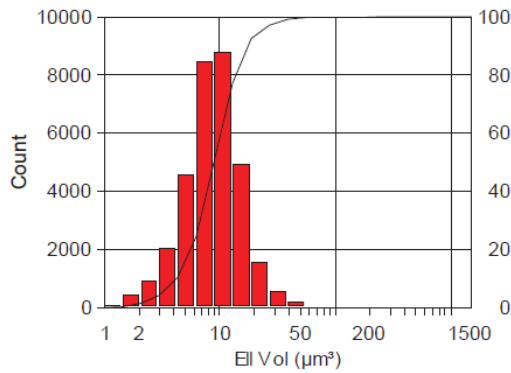
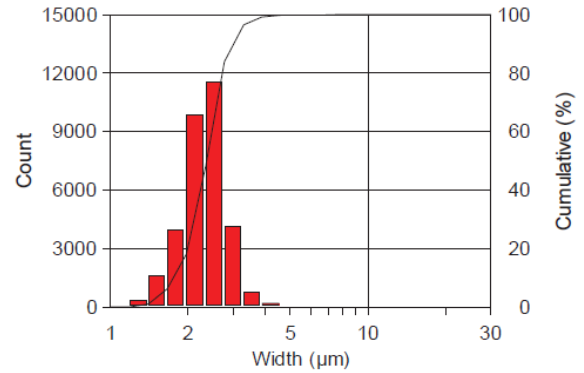
*Figure 5: Typical field of view.*



## Particle Size Analysis (Diluted with H2O)

**Aspect Ratio - Count**

**Sphericity - Count**


<b>Minimum:</b>	1.03	0.85
<b>Maximum:</b>	2.07	1.00
<b>Mean:</b>	1.35	0.96
<b>Std Dev.:</b>	0.16	0.04
<b>D10:</b>	1.16	0.90
<b>D50:</b>	1.33	0.98
<b>D90:</b>	1.58	1.00

**Volume - Count**

**Width - Count**


<b>Minimum:</b>	1.2 µm <sup>3</sup>	1.2 µm
<b>Maximum:</b>	219.0 µm <sup>3</sup>	7.1 µm
<b>Mean:</b>	10.2 µm <sup>3</sup>	2.36 µm
<b>Std Dev.:</b>	6.80 µm <sup>3</sup>	0.468 µm
<b>D10:</b>	4.2 µm <sup>3</sup>	1.8 µm
<b>D50:</b>	8.9 µm <sup>3</sup>	2.3 µm
<b>D90:</b>	16.8 µm <sup>3</sup>	2.9 µm