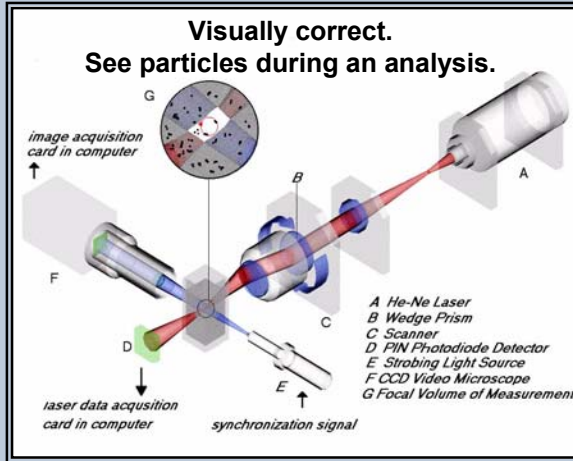


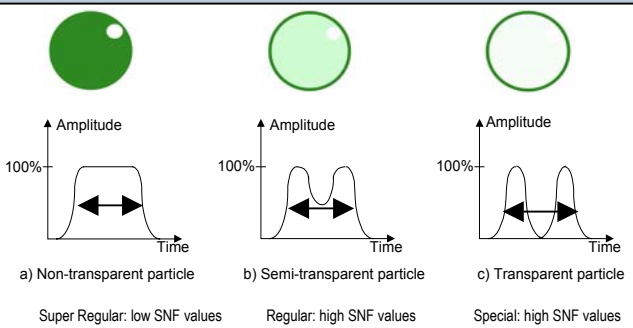
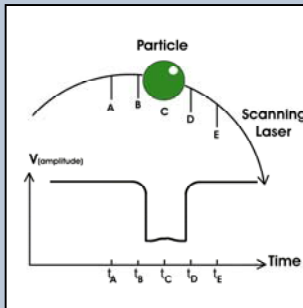


1. The Laser Obscuration - Time-of-Transition

method uses a He-Ne laser (A) focused down to a 1.2 μm spot to circularly scans particles (G), via a wedge prism (B), rotating at a constant high velocity (v). Interaction (TOT) signals are detected by one PIN photodiode (D) and sent to a data acquisition card for analysis in 600 discrete size intervals. Particle diameter (d) is calculated: $d = v \cdot t$. Particles are nearly stationary relative to the focused spot's velocity so no errors occur.

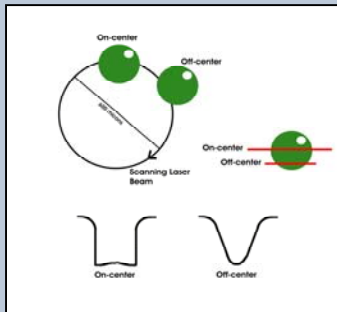


2. Measurement Modes measure the light reaching the detector (SNF value). An easy test of new samples will quickly result in the best mode.



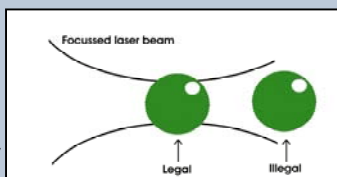
3. What happens to off-center scans?

Particles scanned away from the focused spot have less steep pulse edges, smaller amplitude, incomplete obscuration and are rejected.



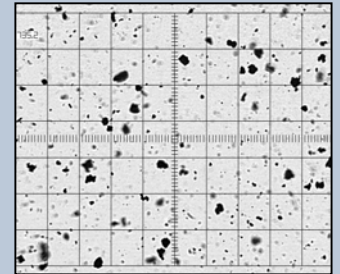
4. What happens to out-of focus scans?

They are rejected by pulse analysis algorithms. The laser expands before and after the spot.



5. Dynamic Image Analysis

A CCD video microscope (F) and a synchronized strobe light (E) send images to a frame grabber card for analysis and display.



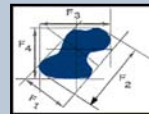
6. 2-D Image Analysis

overcomes spherical particle assumption flaws and yields 36 parameters including Feret Diameters, Shape Factor and Aspect Ratio. Sixteen Shape Filters are available.

7. What size are these particles?



Fibers, rods, and odd shapes can't be defined by one parameter.



Shape Analysis Size = Average Feret diameter: $F1 + F2 + F3... F36 / 36$.

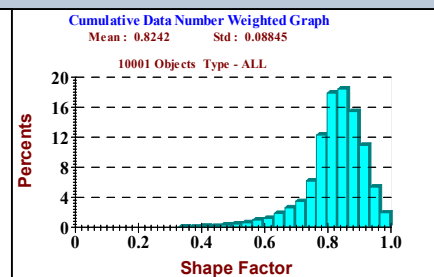
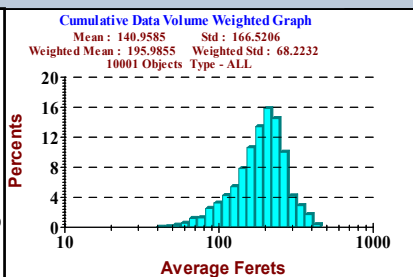
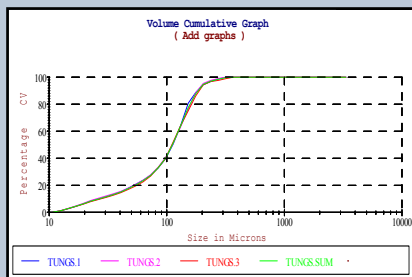


Spherical agglomerate Shape Factor: Left image = 1, Right image = .7

Shapes						
Shape Factor	1	<0.1	0.785	0.604	0.436	0.160
Aspect Ratio	1	1	0.707	0.577	0.250	0.100

8. Conclusion & Added Value: The CIS-100 is the answer to your particle measurement challenges.

- Optimal instrument for sizing spherical, non-spherical, odd shape, acicular and fiber, agglomeration, mixtures, extreme concentrations / volumes and concentration measurement.
- Wide range: 0.1-3600μm, High resolution: 0.3% of full scale (min. 0.2μm) & wide dynamic range: 600:1
- Higher accuracy, precision, repeatability & speed.
- Same method for lab and process; correlation between size and shape; automatic alignment test
- Not subject to optical and physical properties (refractive indices, absorption, surface texture, porosity, electrical conductivity, viscosity variations, Brownian motion, thermal convection) and sphericity errors (ghosts, multiple diffractions, assumptions)



Results: A wide variety of output presentations: size and/or shape distributions, differential histograms, cumulative graphs, tables, statistical results, graph on graph comparisons, real images of particles, etc.

See www.particlesize.com for truth in particle size measurement methods.

- **Particles:** magnetic, delicate, color, porous, transparent, translucent, opaque & mixtures
- **Mediums:** dry powder, suspension, aerosol, emulsion, colloid, opaque, corrosive & organic
- **Applications:** liquid, free-fall, microscope slide, heated & air-born using:



The ACM-104 family of module cells is for **liquid borne particles**. Cuvette cross section sizes: 4 x 4mm (104) and 10 x 10mm (104A). The 104L is for fibers. The See LFC Liquid Flow Controllers.

New: The ACM-111 **Heated Cell** is for application temperatures up to 80°C / 176°F.



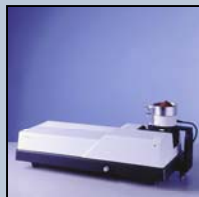
The ACM-101 Magnetic Stirring Cell is for **liquid-borne particles in a plastic or glass cuvette**. Capacity: 0.5ml to 3.5ml. Concentration: 1,000-100,000,000 particles per ml. The ACM-102 has a mechanical stirrer.

New: The ACM-106 **Aerosol Cell** measures user created aerosols. It has thin air sheaths which prevents particles from adhering to the cuvette walls and blocking the laser.



The ACM-108 is for **opaque dispersions** like ink or emulsions. A signal amplifier adjusts for low light. Cuvette cross sections sizes: 4 x 0.5 , 4 x 1 or 4 x 2mm. See LFC Liquid Flow Controllers.

The LFC-101 **Automatic Liquid Flow Controller** w/peristaltic pump for sample preparation, automatic or manual stirring, dilution, circulation, sonication, drainage, flushing and air bubble removal.



The PF-101/C (1st image) feeds **dry powder** from a vibrating bowl through the ACM-112 (2nd image).

The LFC-8 **Liquid Flow Controller** suspends particles uniformly, has a 100 or 15 ml. glass funnel and a variable stirrer. A pump is required.



The ACM-110 moves **standard microscope slides** in x & y steps so no area is measured twice or missed. **For wet and dry.** PD-10 Powder Dispenser. KS-100 Stand for CIS-100 / DSA

CIS-100S & LFC-101 in the lab
 CIS-100L: size analysis
 CIS-100V: size analysis & video
 CIS-100S: size, video & image analysis.

