

AccuSizer® Mini CMP Slurry Monitor

*Real time LPC counting for accurate
process control*

The Patented AccuSizer® Mini technology takes LPC Slurry Monitoring to a whole new level. The AccuSizer Mini allows for the continuous, no dilution, monitoring of CMP slurries at operating conditions.

The AccuSizer Mini slurry monitor was engineered using a modular design approach; this allows us to match our capability modules to the specific needs of our customers online CMP monitoring applications. The sensors options of LE400, FX and FX Nano provide a wide range of size and concentration limits. The sensors are paired with sampling fluidics designed for no dilution, single-stage, or two-stage dilution preparation depending on the slurry. This allows us to investigate any slurry in our applications labs and build a Mini that will generate the best results for your process. Sample mixing and sensor cleaning are all automated to assure consistent results with minimal maintenance.

The AccuSizer Mini slurry monitor reduces the footprint of our lab instrument, incorporates an integrated Windows tablet touch screen personal computer, and allows for point-of-use monitoring, with continuous data acquisition, at the process line. Unlike any other instrument on the market, the AccuSizer Mini counts and sizes hundreds of thousands of particles in minutes, not hours.

Entegris has provided leading semiconductor chip manufacturers with integrated multi-point process control systems that monitor their slurry distribution systems. Our instruments have a proven track record of increasing yield and detecting LPC issues before they become problems that stop the production process or result in defects down the line.



The AccuSizer Mini is designed for the requirements of the process line. A fully embedded PLC device that can be controlled and monitored from a localized LIMS system makes for a more robust, easy use system.

The unparalleled level of accuracy obtained via the combination of a unique single particle sensitivity, and unmatched count statistics, allows the AccuSizer Mini to see ppb levels of LPC's several standard deviations away from the main peak of the distribution. The competition counts hundreds of particles, where we count hundreds of thousands of particles. Entegris provides a high level of statistical accuracy that is unmatched by other single particle optical devices.

Figure 1 presents a silica slurry measured with no dilution which was spiked with a 1.59 micron latex at levels less than 1 ppb of the original slurry concentration. The data displays the tail of the slurry and the spike at 1.59 microns. The volumetric spike at 1.59 microns was calculated to contain 1200 particles/mL. The AccuSizer Mini counted 1525! Note that this also includes the small amount of the slurry tail which in the next channel counted 306 particles. Unprecedented accuracy! Especially considering the extremely low concentration (ppb) of LPC's and spike in a fully concentrated slurry.

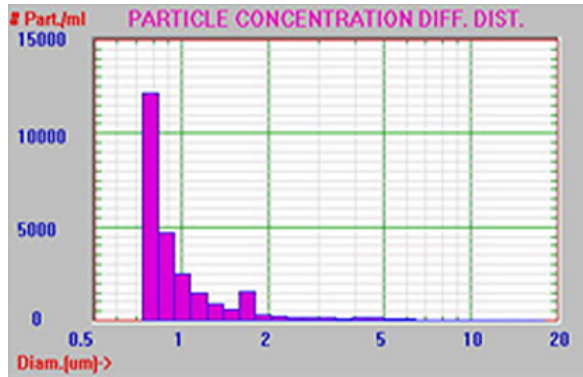


Figure 1.

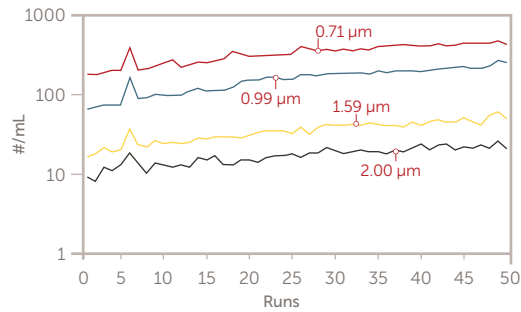
Size	LPC
1.38 microns	586 counts/mL
1.58 microns	1525 counts/mL
1.80 microns	306 counts/mL

BENEFITS

- Continuous monitoring
- No dilution LPC counting
- Real time process control
- Increase yield
- Eliminate defects
- QC incoming slurry
- Reduce analysis time, save money
- Manual injection function
- Field calibration with LE
- Increase filter life
- Optional dilution and sensors
- ROI measured in months, not years
- Built in Windows touch PC

The AccuSizer Mini provides real time trending data for a slurry distribution system. The AccuSizer Mini has a long track record, of over 10 years, as an integral LPC monitoring tool for some of the major chip manufacturers worldwide. Figure 2 is a real time trend graph of slurry at full concentration as it is being pushed through a recirculation loop by a diaphragm pump. The data clearly shows an increase in the LPC counts as the slurry is recirculated over time. This is a direct result of the shear stress the pump has placed on the slurry over time. One can clearly see an almost 4X increase in LPC counts in all of the four size channels that are being monitored. The experiment was designed with a three minute data acquisition cycle.

Silica Slurry (Accelerated Stress)
Rising Aggregation With Increased Circulation (3 hours)
CUMULATIVE CONCENTRATION



The AccuSizer Mini takes proven SPOS technology and brings it into a whole new light allowing for analysis of fully concentrated CMP slurries and real time data acquisition. These new patented capabilities place Entegris and the AccuSizer Mini in a class by themselves. Call us to learn more about how our unique products can provide you with the solutions to your most complex particle sizing and counting applications.

FEATURES

- Accurate results
- Great statistical count
 - Accuracy >300,000 LPC's/min
- Single particle sensitivity
- High resolution sensors
 - Up to 512 discrete size channels
 - Up to 32 user defined channels
- Quantitative results
- Optional sensor ranges
 - FX Nano 0.15 – 10 microns
 - FX 0.7 – 20 microns
 - LE 0.5 – 400 microns
- Built in PC controller
- Modular fluidics options
 - PND: Pump no Dilution
 - LMD: Loop metered drain
 - VMD: Variable mixed dilution
 - LAD: Loop automatic dilution
 - APS: Automatic particle dilution
- Manual injection for field testing
- Sensor calibrations
 - FX: Field verification
 - FX Nano: Field verification
 - LE: Field calibration/ verification

FOR MORE INFORMATION

Please call your Regional Customer Service Center today to learn what Entegris can do for you. Visit entegris.com and select the [Contact Us](#) link to find the customer service center nearest you.

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