High flow rate samplers quickly, reliably measure respirable silica in field tests

**Silica Measurement with High Flow Rate Respirable Size Selective Samplers: A Field Study**


**Key Findings**

- High flow rate samplers showed less than a 30% difference in measured respirable dust mass concentration and quartz mass concentration than low flow rate samplers when outliers (ratio <0.3 or >3.0) were removed from the analysis.
- However, low flow rate samplers may pose problems both with regard to accurate measurement of silica at low airborne concentrations over short sampling durations and calibration (e.g. a cumbersome jar must be used to calibrate 10 mm nylon cyclones).
- The high flow rate samplers allow for greater respirable quartz mass collection over shorter sampling periods affording improved levels of precision. Size-selective high flow rate samplers can reliably quantify silica concentrations below .025 mg m⁻³ even in sampling periods <4 hours.
- Cost, size and weight of both sampler and pump may limit use of high flow rate samplers for routine personal sampling.
- Moderate flow rate cyclones such as the GK2.69 cyclone may represent a good middle ground offering sufficient flow rate to measure concentrations at one half 0.025 mg/m⁻³ over a 4 hour sample with use of lower weight and lower cost pumps already commonly used for field sampling.

**For more information, contact:**

Taekhee Lee: fwc8@cdc.gov

See abstract: http://bit.ly/1YTccY