

DustCount 8899 –Factory Dust Monitoring

Overview

The DustCount 8899 combines the advantages of real-time dust monitoring with the ability to do the standard method all in a compact, lightweight package.

The application is using the DustCount 8899 to monitor worker exposure to dangerous dust over an 8 hour work shift in a factory.



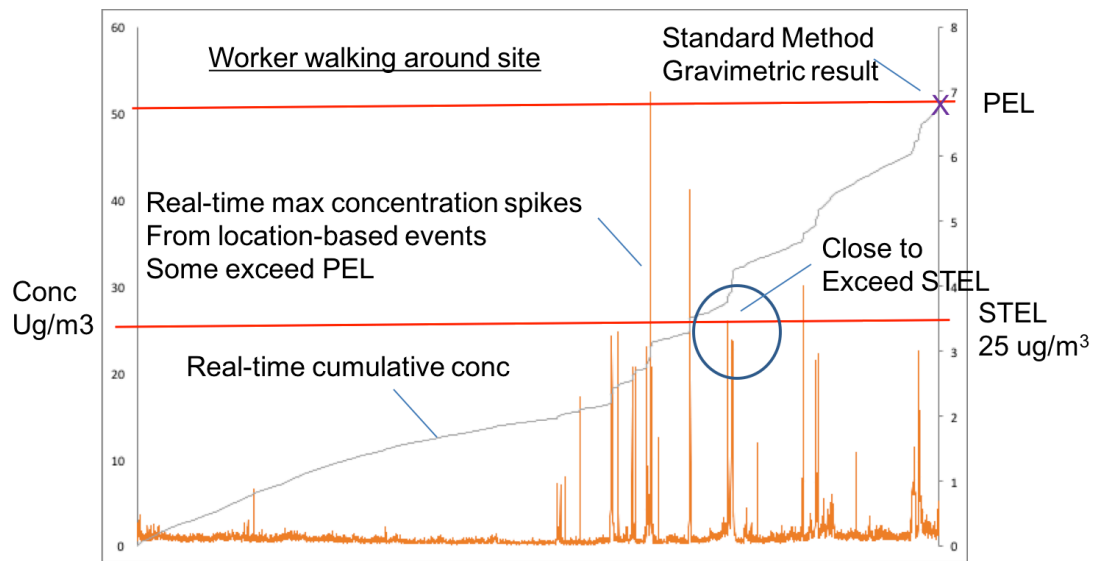
The DustCount 8899 is programmed ahead of time by the Industrial Hygienist. The HEPA filter is used to purge the unit and zero out the initial reading. The alarm threshold is set at 50 ug/m^3 for respirable silicon. The IH uses the Bluetooth feature to connect to their PC to set up the unit and gather the data as the test is underway. The IH then puts the DustCount on the worker. In this case the DustCount is worn under the protective clothing and the tube is run up to the breathing zone and clipped on the workers lapel.

The IH monitors the PC to watch for or hear any alarms that would signify that the worker has exceeded the danger threshold. At the end of the shift the IH turns off the test, collects the monitor and downloads the data and removes the sample filter to send off to the lab for gravimetric and XRD analysis.

Results

The Real-time readings from the DustCount are correlated with the workers activities during the shift and the real-time readings at each location can be reviewed. Some customers have even placed video cameras on the workers so that they can easily correlate the real-time readings with the actual events.

In this application, the workers is preparing to do the batch using a computer program so there is not much activity in the morning. In the afternoon, the worker starts to prepare the crucible and the molds to do the pour. Spikes start almost immediately. As dust is disturbed on the factory floor and the crucible is moved around and then poured and then moved away from the mold. The mold is moved and quenched and then after a while the mold is left to cool and then vopened and some base sanding is done.



Eight Hour Shift Results – Real-time Data + Mass concentration vs time

Filter Analysis shows 76% crystalline Silica and real-time analysis shows a high base level of dust concentration leading to high cumulative results very early in the shift. Respirator protection is essential.

At one point the worker is exposed to what seems to be a dangerous plume of dust. Once the composition is analyzed at the lab it shows that the percentage of dangerous dust in this factory is 76 percent of the sample. This factor is plugged back into the DustCount and then the plume turns out to be high but below danger levels.

Note that the Gravimetric analysis shows the daily exposure to be just under the new Silica standard of 50 ug/m^3 . This correlates perfectly with the real-time meter

Conclusions

The key to the value of real-time devices is the accuracy and amount of data that an IH gets from the shift vs the standard method alone. This allows much more depth of analysis of causes and locations of danger that can be controlled. With the DustCount the gravimetric sample is the EXACT SAME DUST that is tested in real time so there is perfect correlation with standard method vs direct reading. Furthermore the results from the gravimetric, XRD or IRA can be fed back into the meter to correct factors in the readings.

Finally the DustCount provides a 20 point particle distribution reading for each sample. This can be used to determine the type of danger the worker is being exposed to. Larger particles can cause lung cancer, emphysema and COPD but smaller particles go through the lungs air exchange system and end up in organs such as the liver and the brain.