nanozen
know the air you breathe

DUSTCOUNT® APPLICATION NOTE: PROCESSING PLANT DUST MONITORING

OVERVIEW

The DustCount 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 to monitor worker exposure to dangerous dust over an 8-hour work shift in a grain processing plant.



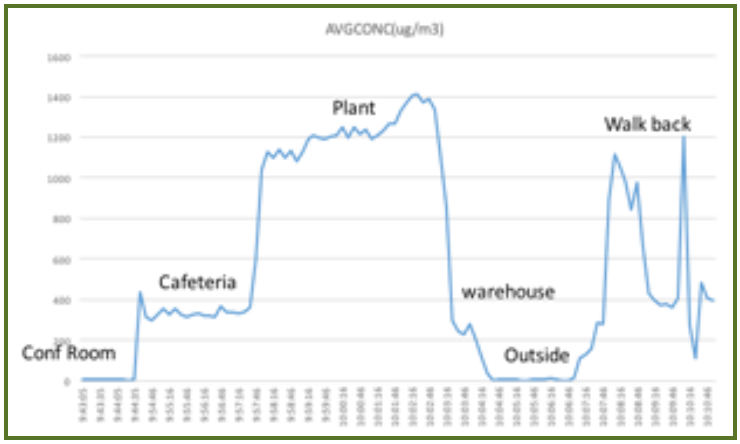

The Industrial Hygienist (IH) connects the DustCount to the PC via Bluetooth and uses the DustCount software to configure the unit prior to running the test. A HEPA filter is used to purge and zero check the initial reading. The alarm threshold is set at 50 ug/m3 for respirable silica. The IH puts the 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 to the workers lapel.

The IH monitors the PC for any alarms that would signify that the worker has exceeded the danger threshold. At the end of the shift the IH collects the monitor, 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. 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 worker is moving around the plant. With the DustCount, they can immediately see that even in their cafeteria the levels of dust are much too high and control measures must be reviewed. In the Mill the dust is stirred up from pouring grain at various places around the mill. Monitor Silica and other dust accurately and effectively with a single wearable device.



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

The real-time analysis shows a high base level of dust concentration leading to high cumulative results very early in the shift. If gravimetric testing is required for regulatory issues, then the sample filter of the DustCount can be used to collect the dust and be sent away for testing.

At this site respirator protection is essential. This could be reduced by using fans or putting hoods on the process areas. With the DustCount the company can experiment with different solutions and retest immediately without having to send a sample to the lab or paying consultants for analysis.

CONCLUSIONS

The value of real-time devices is the accuracy and amount of data that is available. This allows more depth of analysis of causes and locations of danger. Money can be focused on control techniques for specific dangerous areas.

The DustCount also provides a particle distribution reading for each sample. 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. An example from the previous test is shown below. Notice that the particles in this case are mostly very small falling between .5um and 2.5 um.