

How did we determine the risk levels of silica exposure in maintenance hangars?

Using the Trolex Air XS, the world-first Respirable Crystalline Silica (RCS) monitor, Sunbelt Rentals were able to identify, and report in real-time, the exposure levels to workers and visitors at the Balfour Beatty Bottesford maintenance hangars. This enabled the site to improve their long-term mitigation methods, implement preventative strategies and create a safer working environment for everyone.

3

3-week trial



World-first
real-time silica
monitor

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The Bottesford maintenance hangars are used daily to store and maintain groundwork equipment, such as core drills.

This equipment often returns from hire covered in various aggregate compounds, such as concrete, and needs to go through a rigorous cleaning process where much of the aggregate material is broken off before the equipment is thoroughly washed and cleaned.

This process elevates the potential risk of Respirable Crystalline Silica (RCS) exposure to people operating within the hangars where the equipment is being stored, moved and worked on throughout the day.

Challenges

The challenge was to determine the level of risk, if any, to individuals working with the groundworks equipment throughout the day, as well as the risk to anyone visiting the hangars.

Balfour Beatty also wanted to increase awareness of the dangers of RCS and protect the workforce from hazardous airborne particulates. As highlighted by the HSE, elevated levels of RCS are extremely harmful from an occupational health viewpoint, making it particularly important to understand the risks in the working environment and to individual health

“ The Trolex Silica Monitoring Unit trial was informative and offered valuable insight into the potential site-specific risks associated with silica exposure.

The analysis of collected data from the unit provided useful information regarding areas where silica exposure was elevated, as well as potential factors contributing to the levels observed through accurate time stamps on the data recordings from the Trolex unit.

Additionally the trial successfully assessed the effectiveness of existing control measures. It identified areas where improvements could be made, and we immediately began process improvements through training, engagement with stakeholders and site-specific preventative strategies. This evaluation will be useful in improving long-term risk mitigation methods. I would like to express my satisfaction with the trial's organisation, execution, and outcomes. The knowledge gained from this trial will be used to improve our silica control methods and ensure the continued safety of our colleagues.”

Nick Moon

Business Manager – Cranes & Piling Plant, Balfour Beatty, Asset & Technology Solutions



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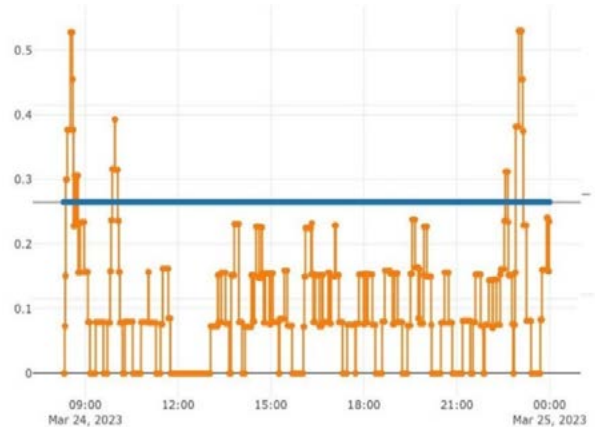
Solution

Using the world-first real-time silica monitor, the Trolex Air XS from Sunbelt Rentals recorded the RCS levels over a three-week period from 13th to 29th March 2023, identifying and monitoring exposure to workers within the hangars. This solution was supplemented with additional personal dust monitors to ensure a comprehensive data set was collected.

The Trolex Air XS uses light refraction properties unique to RCS to determine size, shape and quantity of particulates in real-time and provide a live on-screen value for airborne silica. Key features of the Trolex Air XS include:



- On-device display of RCS measurement in mg/m³ or total particles counted per litre of air sampled. Rolling averaging periods based on 15-minute, 1, 4, 8 and 12-hour patterns.
- On device warnings and alarms based on custom trigger thresholds.
- Data logging for download and post analysis using the Trolex BreatheXS software.
- Reports are easily accessible through the bespoke software, allowing the team to take decisive action to keep people safe.



Silica Exposure Levels On Site

Results

The data collected by the Trolex Air XS over the three-week trial, showed that exposure to RCS was high throughout the working day due to local activity.

With the average exposure level at 0.3mg/m³, this was three times the recommended level of 0.1mg/m³ recorded from the HSE. The personal dust monitors also recorded higher than recommended levels, although this was not for prolonged periods of time.

Whilst it is a site requirement that all workers wear and use the correct Respiratory Protective Equipment (RPE), the trial also monitored exposure to visitors outside of the direct operational areas, where there are not the same RPE requirements.

Analysis of the data gathered from the Trolex Air XS during the trial clearly shows that there is a significant risk of RCS exposure in the work areas, and adjoining areas of the hangars, with the personal dust monitor also supporting these findings.

RCS levels remained above the 0.1mg limit for much of every 24-hour period, with not one period average falling below the limit over the monitoring period. Overall the trial was successful in alerting the site to the risk that RCS presents within the hangars, and equipped Balfour Beatty with the data and knowledge that enabled them to implement a number of effective preventative strategies, providing a safer working environment for individuals on site.