Dust Analysis

Assessing Risks from Coal Mine Dusts - Analysis of Crystalline Silica and Coal Content

Monitoring of coal mine dust levels is a critical process in controlling the risks of exposure to workers and is required under Australian law. Specific exposure standards have been established for these dusts, based on Australian Standards and US methods.

These methods measure the total amount of respirable coal mine dust, with additional testing required to determine the silica content. The silica content of coal mine dust is critical to risk assessments, with exposure standards for crystalline silica even lower than those for coal mine dust.

ALS offers coal mine dust analysis for occupational exposure assessment and monitoring, with the amount of crystalline silica present able to be determined as part of the analysis. This allows the different risk factors to be assessed, with the opportunity for additional testing by more specific methods also available. Dust samples can be examined either by SEM/EDS (for respirable and inhalable dusts), or by stereomicroscopy for coarser dusts.

Although this examination is only semi-quantitative, it gives a more comprehensive picture of what the dust is composed of, which can assist in establishing the actual risk factors at a given mine site or for certain mine workers. A higher coal rank, or amount of carbon in the coal, is associated with a higher risk of developing coal workers' pneumoconiosis (CWP), also known as 'black lung' disease.

In addition to the samples collected during occupational hygiene monitoring, mines commonly collect Depositional Dust samples around the mine site perimeter to assess the dust that drifts off-site and settles out, as well as high volume air filter samples, which collect airborne dusts. These high volume air samples can include the fine PM10 and PM2.5 fractions, as well as Total Suspended Particulates.

Monitoring of emissions of these dusts is also regulated, usually under State environment laws. This monitoring assists in developing an understanding of wider environmental impacts and the potential level of exposure that the broader community might experience. Samples from this type of monitoring can also be examined for the presence of coal dusts by the appropriate SEM/EDS or stereomicroscopy methods to refine the assessment of potential risks or help in determining the source of airborne dusts.

Please contact an ALS laboratory to discuss how we can help to analyse your respirable dust.

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