

# 3<sup>rd</sup> International Conference and Exhibition on Occupational Health & Safety

June 24-25, 2014 Valencia Conference Centre, Valencia, Spain

## An assessment of exposure to respirable crystalline silica and the impact on lung function among quarry workers in Queensland

Kevin Hedges

University of Western Sydney, Australia

Exposure to respirable crystalline silica among quarry workers in Queensland was assessed. The assessment evaluated airborne concentrations of respirable crystalline silica, lung function and risk factors including exposure profile, particle size distribution and morphology.

Results from personal exposure monitoring show that exposures exceeded the Safe Work Australia Exposure Standard of 0.1 mg/m<sup>3</sup> at many sites. The median maximum physical diameter of sampled particles was found to be 3.9 µm which is close to the theoretical median aerodynamic diameter of 4.25 µm provided in Australian Standard AS 2985-2009. However, most particles identified and measured by Scanning Electron Microscopy had a diameter of 2 µm and thus mass based sampling using a cyclone may not provide an accurate estimate of risk where particles less than this size are considered to present a greater risk. An unexpected finding was the identification of particles that had needle-like morphology. A high proportion of sampled workers demonstrated restrictive and obstructive lung function patterns of varying severity. The findings of this study and others indicate that the current exposure standard for crystalline silica is not adequate to protect workers' respiratory health. Data also serve as a prompt to re-evaluate how worker health and health surveillance should be managed and regulated in mines and quarries. More data collection with follow-up statistical analysis will add power to this study. It is also suggested that the particle shape (morphology) is a key factor which warrants further investigation when assessing the impact particles have on the lung.

### Biography

Kevin Hedges expects to complete his PhD in 2014. He is Australian and more recently has become a permanent resident of Canada. He has 24 years' experience in Occupational Hygiene and is certified with the Australian Institute of Occupational Hygienists (AIOH) and American Board of Industrial Hygiene (ABIH). He has been the recipient of awards presented by the AIOH which has allowed him to complete a Masters in 2000, and also provided him with the opportunity to present at International Conferences including the International Occupational Hygiene Association (IOHA) conference in Rome, Italy. He has extensive industry experience and also has held positions as Principal Occupational Hygienist with the Queensland Government. He is currently employed with the Newfoundland/Labrador, Canadian Provincial Government.

kevinhedges.kh@gmail.com