

BBE Laboratory supplies state-of-the-art analysis and sampling technologies to reduce airborne occupational hazards in African mines and manufacturing industries

BBE Laboratory plays a leading role in diminishing the impact of airborne occupational hazards in the sub-Saharan African mining and manufacturing industries. Consistently achieving the best turnaround times in the industry for years, BBE Laboratory strives to give accurate and traceable results on all samples. We employ qualified and competent staff, use state-of-the-art equipment, and apply relevant and up-to-date analysis methods.

We have close links and long-standing associations with most national and international role players in the field. While we always work to strict confidentiality guidelines, we are also willing to sign non-disclosure agreements (NDAs) to give our clients full peace of mind.

ANALYTICAL SERVICES

BBE Laboratory provides the following services:

- Gravimetric analysis of dust on occupational hygiene filters
- Quartz analysis by:
 - X-ray diffraction (XRD) analysis
 - Fourier transform infrared (FTIR) spectrometry
- Elemental analysis by inductively coupled plasma optical emission spectrometry (ICP-OES)

GRAVIMETRIC ANALYSIS

We do the pre- and post-weighing of occupational hygiene filters in accordance with Standard Method MDHS14 (Methods for the Determination of Hazardous Substances, issued by the Health and Safety Laboratory of the Health and Safety Executive (HSE), UK): "General methods for sampling and gravimetric analysis of respirable, thoracic and inhalable aerosols." A Mettler XS3DU Microbalance is giving exceptional detection limits and reproducibility.

RESPIRABLE CRYSTALLINE SILICA (RCS) QUARTZ ANALYSIS METHODS

By X-ray diffraction

Filters analysed include mixed cellulose ester (MCE), polyvinyl chloride (PVC) and silver, preferably 25 mm, but 37 mm ones are also accepted. Filters are analysed for respirable alpha quartz content by direct-on-filter X-ray diffraction (DoF XRD) according to Standard Method MDHS101: "Crystalline silica in respirable airborne dusts. Direct-on-filter analyses by infrared spectroscopy and X-ray diffraction."

A Bruker D4 Endeavour automated X-ray spectrometer with a 66-position sample changer is utilised to meet customers' requirements with regards to turnaround times. National Institute of Standards and Technology - Standard Reference Material (NIST-SRM) 1878a is used to prepare the calibrations filters.

By Infrared spectroscopy

A Bruker Tensor 27 FTIR spectrometer is used to analyse the samples, pellets and/or filters.

The alpha quartz content of filters can also be determined by preparing potassium bromide (KBr) pellets and analysing the pellets by FTIR spectroscopy according to Standards Method NIOSH 7602: "Silica, respirable crystalline, by IR (KBr pellet)."

BBE Laboratory analyse client-prepared KBr pellets and also prepare, press and analyse pellets from supplied filters; either MCE or PVC filters, with



Exercising and intermediate check of the performance of the microbalance with the calibrated mass pieces prior to weighing the filters Photograph: BBE Laboratory

25 mm or 37 mm diameters. KBr pellets are pressed using an automated press to ensure quality and consistency. NIST SRM 2950 is used to prepare the calibrations filters.

Direct-on-filter respirable alpha quartz content determination can also be conducted by FTIR spectroscopy on PVC filters according to Method MDHS 101: "Crystalline silica in respirable airborne dust. Direct-on-filter analyses by infrared spectroscopy and X-ray diffraction." NIST SRM 1878a is used to prepare the calibrations filters.

ELEMENTAL ANALYSIS BY ICP-OES

A Thermo Scientific iCAP 7200 Duo ICP-OES is used to analyse the solutions prepared from the dissolved filters (PVC or MCE) for the typical elements present in welding fumes, or as requested by the customer.

ACCREDITATION

BBE Laboratory is an ISO/IEC 17025-accredited laboratory (SANAS Facility Accreditation Number T0496).



PROFICIENCY TESTING SCHEMES

BBE Laboratory regularly participates in proficiency-testing schemes that provide independent verification of the analytical competence of the laboratory.

BBE Laboratory has been participating in the international Workplace Analysis Scheme for Proficiency (WASP) testing scheme, hosted by the Health and Safety Laboratory (HSL) in the United Kingdom, from round 81 in April 2009 to round 100 in February 2014. Since April 2014, the WASP scheme has been managed by LGC Standards under a comprehensive air & stack (AIR) proficiency scheme; BBE Laboratory participates in both annual rounds each year, for gravimetric as well as quartz by XRD and FTIR analysis.

BBE Laboratory is a subsidiary company of South African-based Bluhm Burton Engineering Group (BBE).

For further information, contact Retha Rossouw: Tel: +27 (0)12 349 5111

E-mail: retha@bbelab.co.za,

Website: www.bbelab.co.za

BBELABORATORY