

A wealth of world class expertise all in a single organisation

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For further information on any of the service leaflet or any of HSL's other capabilities, Please contact us:

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What is biological monitoring?

» Many jobs involve using chemicals that can be harmful to health if not properly controlled. For some chemicals biological monitoring can be used to indicate how good control is and how much of the chemical has entered the body. It is a way of assessing exposure and health risks, and involves measuring the chemical or its breakdown products in urine, blood or breath.



Why carry out biological monitoring?

Biological monitoring has a number of benefits when compared with other types of exposure monitoring:

- it can help to show whether personal protective equipment (e.g. gloves, masks) and engineering controls (e.g. extraction systems) are effective in controlling exposure
- it measures exposure to a chemical via all routes - breathing in, ingestion and absorption through the skin
- it can tell you what has actually been absorbed into the body
- it can show how effective any improvements in controls have been in reducing exposure
- it can provide reassurance to workers that their personal exposure is under control.

Biological monitoring can be used to good effect on its own or alongside other monitoring techniques (such as air and surface contamination measurements) and observational hygiene assessments to provide important information on chemical exposures in the workplace.

Why use HSL?

HSL has provided biological monitoring services for over 30 years. During that time we have developed robust and well validated methods that enable us to monitor exposure to over 60 chemicals or classes of chemical. We have helped HSE to set and interpret Biological Monitoring Guidance Values. This experience gives us a unique knowledge base and provides a firm foundation for the interpretation of results – a key component in any biological monitoring strategy.

Additional benefits of HSL's service

Our analytical services are underpinned by an extensive research programme, aimed at delivering continuous improvement to the services we offer.

Where possible HSL has developed non-invasive techniques to avoid the need to take blood samples from workers. We are continuing to develop improved methods, for example in the field of breath analysis.



HSL can help on a day-to-day level by providing sample collection kits, packaging materials and full instructions for sending samples through the post in accordance with legal requirements – all included in the price of the analysis.

HSL also offers a range of air and surface monitoring services for chemicals that can be used with biological monitoring to provide a comprehensive monitoring strategy.

Biological Monitoring Guidance Values (BMGV)

HSE have introduced biological monitoring guidance values into their Guidance Note EH40 - 'Occupational Exposure Limits' (<http://www.hse.gov.uk/coshh/table2.pdf>). These guidance values are intended to assist in the interpretation of biological monitoring results with respect to occupational exposure.

In the UK, there are currently 17 chemicals with BMGVs proposed by HSE. These are listed in EH40. Each one has an information sheet outlining the monitoring method to be used and other details. These information sheets can be supplied on request by HSL, on behalf of HSE. Internationally, the American Conference of Governmental Industrial Hygienists in the US and the Deutsche Forschungsgemeinschaft in Germany have introduced many more values for chemicals.

As a laboratory with a world-wide reputation and networks in the field of biological monitoring, HSL is able to use these values and other authoritative sources to provide additional help with the interpretation of results.

Are you controlling exposure to asthmagens?

Biological monitoring (BM) at a motor vehicle repair company showed all staff, even administrators, at the premises had detectable traces of isocyanate from spray paint in their urine. This prompted an investigation, which found that the spray booths (which had just passed their annual inspection and test) were leaking vapours into the building's ventilation system. The spray booths were repaired and subsequent BM showed that the control measures were working properly. In addition BM highlighted training issues as booths were not used properly. Follow-up BM has been recommended for ongoing checks on the adequacy of controls. HSE now recommends annual biological monitoring for spray painters (http://intranet/operational/sims/manuf/3_08_11.htm).



How to control exposure to MbOCA

Methylene bis (2-chloroaniline) (MbOCA) is a substance used in the manufacture of some polyurethane products. It is a suspected carcinogen and is readily absorbed through the skin, therefore BM of workers is recommended to measure exposure via all routes. HSL has been monitoring the majority of UK MbOCA workers since 1977; the graph shows that there has been a steady decrease in their urinary MbOCA levels over this period. This reflects the fact that BM has enabled poor working practices to be identified and improved, with the result that MbOCA exposures have been reduced dramatically, although recent surveys have shown that improvements have stagnated and further efforts may be required (Cocker et al, 2009, doi: 10.1093/annhyg/mep026).

