G408

COSHH Essentials: General guidance

Urine sampling (biological monitoring) for isocyanate exposure measurement

Control approach 4: Special

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure is prevented or, where this is not reasonably practicable, adequately controlled. This guidance gives practical advice on how this can be achieved by applying the principles of good practice for the control of exposure to substances hazardous to health, as required by COSHH.

It is aimed at people whose responsibilities include the management of substances hazardous to health at work (eg occupational health specialists, anyone undertaking COSHH assessments and supervisors). It is also useful for trade union and employee safety representatives. It will help you carry out COSHH assessments, review existing assessments, deliver training and supervise activities involving substances hazardous to health.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance, you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance. See Essential information near the end of the sheet.

Introduction

- Isocyanates often occur in:
  - two-pack spray paints, lacquers, underseals and varnishes;
  - some glues and adhesives;
  - foam and plastic production;
  - building products (floor mastics, wall seals, fillers, attic treatments, etc); and
  - hot work on polyurethane foam, cured paint or plastic.
- A biological monitoring guidance value (BMGV) is set at 1 micromol (1 µmol) urinary diamine per mol creatinine, for urine samples taken at the end of the task. This is not a statutory limit – rather, it is a value that most companies using good practice can get below. It has no significance for health.

Urine tests

- Urine testing is recommended to assess exposure to isocyanate and the effectiveness of controls such as respiratory protective equipment (RPE), and safe working procedures. It supplements air sampling, which assesses the effectiveness of mechanical controls.
- Testing works by measuring the breakdown products of isocyanate (diamine) in urine. This means taking samples of urine from:
  - workers who are exposed to isocyanate products, via skin contact or the inhalation of spray or vapour; and,
  - other unprotected workers nearby.
- Urine samples may be taken once or twice a year, unless it is clear from existing results that exposure is not happening.
- Companies with good control practices - including, training and instruction of workers - can drive isocyanate exposures down to very low levels. Urine testing is a reliable way of checking that workers' exposures are being properly controlled. If not, the control measures may not be working effectively. The action then is to investigate how or why the controls were ineffective, and remedy this.
- Urine samples should be collected immediately after the task or shift has finished.
- HSE's laboratory offers a low cost commercial service to measure isocyanate breakdown products in urine. This service includes a kit for collection, packing and instructions. Other labs may be able to offer equivalent services.

Consent

You need workers' informed consent to carry out urine sampling - a model form for this appears on page 3.

Interpreting results

- Urine tests for isocyanate give no information about workers' health; they are simply a measure of their exposure. If workers are concerned, arrange for them to talk to an occupational health professional.
- Results need interpreting – eg why are the results high? HSE's laboratory can advise on simple practical ways of setting up a BM programme, and help in interpreting the results. A single high result may need a second, confirmatory sample.
- Show workers their results, and tell them what action you plan to take.

Quality assurance

- Any laboratory offering a urine sampling (or other BM) service should participate in a relevant quality assurance scheme.

Further information

For information on how HSE's laboratory can work with you to resolve your health and safety issues and meet your requirements, contact: Business Development Unit, Health & Safety Laboratory, Harpur Hill, Buxton SK17 9JN. Tel: 01298 218218 e-mail: hslinfo@hsl.gsi.gov.uk or log onto https://solutions.hse.gov.uk/ .

For professional advice, search the available directories from the British Occupational Hygiene Society (www.bohs.org) or the Society of Occupational Medicine (www.som.org.uk).

Also see www.nhshealthatwork.co.uk/.

This document is available at: www.hse.gov.uk/pubns/guidance/ and www.hse.gov.uk/coshh/essentials/

Kate Jones, Biological monitoring for isocyanates, Occupational Medicine, Volume 69, Issue 7, October 2019, Pages 515–517, https://doi.org/10.1093/occmed/kqz109

For information about health and safety visit https://books.hse.gov.uk or http://www.hse.gov.uk

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To report inconsistencies or inaccuracies in this guidance email: commissioning@wlt.com

Informed consent

You need workers' informed consent - use a form similar to the example shown below.

Informed consent

Regarding the control of exposure to isocyanate at _____ (premises),

your agreement is needed to provide a sample of urine

to a representative of _____ (service provider/manager),

to decide whether further steps are needed to control your exposure.

Please note:

1 The sample will **only** be analysed for isocyanate exposure

2 The result will indicate your **personal** exposure to isocyanate

3 Do you want to receive your **own** copy of the results, and be told what it means? YES / NO

If YES, send the result to: _____

_____

_____

You can show the results to your Trade Union safety representative, if you wish.

4 The result will show whether improvements in control are needed to reduce your exposure.

Please select one of the options below.

	Tick one
You can send my personal test result and interpretation to my employer.	
You can send my anonymised result and interpretation to my employer.	
You may send only the interpretation to my employer.	

Employee's signature _____ Date _____