# P23

COSHH essentials for Printing

# Printing with isocyanate-based inks

## Screen printing

**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.**

### What this sheet covers

This sheet describes good practice for using isocyanate-based inks.

It covers the key points you need to follow to help reduce exposure to an adequate level. Follow all the points or use equally effective measures.

### Hazards

- Frequent contact with solvent-based substances used in printing processes can cause dermatitis, a common problem in the industry.
- Some of the solvent-based substances can be harmful if a high concentration of their vapour is breathed in. They can cause dizziness, drowsiness and other effects on the central nervous system.
- Isocyanate-based products can cause skin allergies and asthma.
- Check safety data sheets for any workplace exposure limits.

### Access to work area

✓ Restrict access to authorised and appropriately trained people only.

### Equipment and procedures

✓ Consider using isocyanate-free products.

✓ Avoid products containing HDI, IPDI or TDI – check the safety data sheet. If you do need to use an isocyanate-based product, choose one containing MDI, which is less volatile.

✓ For mixing large amounts eg more than 500 mls, extraction (also known as local exhaust ventilation or LEV) will be needed. Seek specialist advice.

✓ Extraction of vapour should not be needed if mixing only small amounts of ink, eg less than 500 ml per day per workshop.

✓ You need extraction for semi-automatic printing with oven drying/ curing.

✓ Wire in the extraction with the printing unit. You may need flameproof fittings.

✓ Make sure the oven is kept below atmospheric pressure when in use.

✓ Position the drying rack inside an extracted booth.

✓ Locate the booth away from doors, windows and walkways. Draughts may interfere with the extraction.

✓ Airflow into openings must be sufficient to effectively control airborne contaminants. It will depend on the design and size of openings (see HSG258).

✓ Fit a manometer, pressure gauge or tell-tale to show that extraction is working.

✓ Discharge extracted air to a safe place in the open air, away from doors, windows and air inlets.

- ✓ Provide a good standard of general ventilation. Use powered wall- or window-mounted fans to supply fresh air, greater than five air changes per hour, with a through draught.

### Respiratory protective equipment (RPE)

- ✓ RPE is normally not needed for routine operations.
- ✓ Air-fed RPE may be needed for use in emergencies, eg cleaning up spillages. This needs a supply of clean compressed air. Provide an LDM2 air-fed half mask. See sheet R3.

### Personal protective equipment (PPE)

- ✓ Chemicals in **hazard group S** can damage the skin and eyes, or enter the body through the skin and cause harm. See sheets S100 and S101 for more specific advice. Check the safety data sheets to see what PPE is needed.
- ✓ Ask your safety clothing supplier if you need any advice on selecting suitable protective equipment.
- ✓ Provide storage for PPE to prevent damage or contamination when not in use.
- ✓ Keep any PPE cleaned and replace at recommended intervals.

### Gloves

- ✓ Follow any advice on the safety data sheet on suitable gloves. If no specific information is provided, nitrile gloves, 0.2 mm thick are typically acceptable.
- ✓ Ensure that workers wear them.
- ✓ Tell workers to dispose of single-use gloves every time they take them off.

### Other protective equipment

- ✓ Provide cotton overalls to minimise clothing contamination.
- ✓ Tell workers to immediately change any heavily contaminated overalls (eg from spills) and ensure they are laundered before reuse.
- ✓ Use a contract laundry or a suitable equivalent to wash work clothing. Don't allow workers to do this at home.

### Personal decontamination and skin care

- ✓ Provide warm water, mild skin cleansers and soft paper or fabric towels for drying. Avoid abrasive cleansers.
- ✓ If hand cleansers are needed to remove ink, ensure workers rinse them off afterwards.
- ✓ Never allow solvents to be used for cleaning skin.
- ✓ Provide pre-work creams, which will make it easier to wash dirt from the skin and after-work creams to replace skin oils.

**Caution: 'Barrier creams' are not 'liquid gloves' and they do not provide a full barrier.**

### Maintenance, examination and testing

- ✓ Keep all equipment used in the task in effective working order. Maintain it as advised by the supplier or installer.
- ✓ Check for signs of damage to control equipment before starting work.
- ✓ Check transfer hoses and connectors regularly for leaks.
- ✓ At least once a week, check that any airflow indicators work properly.

- ✓ Have equipment thoroughly examined and tested against its performance standard, at suitable intervals.
- ✓ Biological monitoring for isocyanates may be required. See sheet P47.
- ✓ For LEV systems, a user manual or log book is helpful in setting out the frequency of checking, maintenance and parts replacement.
- ✓ For LEV systems with no user manual or log book, you may need the help of a competent person. They can determine the performance needed for adequate control.

### Examination and testing

- ✓ LEV systems require statutory 'thorough examination and testing' (TExT).
- ✓ Get a competent ventilation engineer to perform the TExT at least once every 14 months (see HSE publication HSG258).
- ✓ Carry out all actions arising from the TExT.
- ✓ HSG258 provides more detailed information on LEV systems and legal and competence requirements.

## Records

- ✓ Keep records of all examinations and tests for at least five years.

## Cleaning and housekeeping

- ✓ Clean equipment and the work area daily. Clean other equipment and the workroom regularly – at least once a week.
- ✓ Store containers in a safe place, and dispose of empty containers safely.
- ✓ Put lids on containers immediately after use.
- ✓ Deal with any spills immediately. Contain or absorb liquids with granules or mats. Workers may need RPE for larger spills. Workers will need an impervious apron and thick protective gloves for this 'hands on' task. New 0.4mm thick nitrile gloves are appropriate.
- ✓ Throw away gloves once used. Dispose of granules/mats/cloths and gloves as hazardous waste.

## Health surveillance

- ✓ Provide health surveillance for asthma where there is a reasonable likelihood that asthma may occur in your workplace. See sheet G402.
- ✓ Provide health surveillance for dermatitis where there is a reasonable likelihood that dermatitis may occur in your workplace. See sheet G403.

## Training and supervision

- ✓ Tell workers about the harmful nature of the substances they handle.
- ✓ Tell workers about the signs of dermatitis and what to do if they spot them.
- ✓ Provide workers with training on:
  - working safely with hazardous substances;
  - when and how to use controls;
  - how to check they are working;
  - how the LEV system works;
  - how to use the LEV to get the best out of it;

- how to check that the LEV is working; and
- what to do if something goes wrong.

✓ Have a system in place to ensure that safe work procedures are followed.

✓ Involve managers and supervisors in health and safety training.

## Essential information

S100 – General advice on chemicals causing harm via skin or eye contact.

S101 – Selection of personal protective equipment.

G403 – Health surveillance for occupational dermatitis.

G402 – Health surveillance for occupational asthma.

G408 – Biological monitoring for isocyanates.

R3 – Selection and use of RPE: Protection factor 20.

## Further Information

Safety data sheets

*Controlling airborne contaminants in the workplace*, Technical guide no. 7, British Occupational Hygiene Society 1987, ISBN 0 9059 2742 7

*Controlling airborne contaminants at work: A guide to local exhaust ventilation* (LEV), HSG258, HSE Books 2011, ISBN 9780717664153, www.hse.gov.uk/pubns/books/hsg258.htm

*Managing skin exposure risks at work* www.hse.gov.uk/pubns/books/hsg262.htm

Skin care and glove posters www.hse.gov.uk/printing/dermatitis/posters.htm

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

You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

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

## Employee checklist

- ☐ Make sure any ventilation is switched on and working.
- ☐ Look for signs of damage, leaks, wear or poor operation of any equipment used. If you find any problems, tell your supervisor. Do not carry on working if you think there is a problem.
- ☐ Wash your hands before and after eating, drinking or using the lavatory. Do not use solvents to clean your skin.
- ☐ Clear up spills immediately. Contain or absorb liquids with granules or mats.
- ☐ Use, maintain and store any PPE provided in accordance with instructions.
- ☐ Check your respiratory protective equipment works properly every time you use it.
- ☐ Throw away single-use gloves every time you take them off.
- ☐ Don't use damaged gloves.
- ☐ Care for your skin as instructed.
- ☐ Check your skin regularly for dryness and soreness – tell your supervisor if these appear.