



Control approach R

Isocyanate – spraying two-pack products in a spray/bake booth

Respiratory protective equipment

MR02



This guidance sheet is for employers including the self-employed and franchisees

to help them comply with the requirements of the Control of Substances Hazardous to Health Regulations 2002 (COSHH) by controlling exposure to chemicals and protecting workers' health.

The sheet is part of HSE guidance *COSHH essentials: easy steps to control chemicals*. It describes the key points you need to follow to help reduce exposure to an adequate level. It is important to follow all the points, or use equally effective measures.

The isocyanate in two-pack products can cause asthma and dermatitis. Consider using isocyanate-free products.

Exposure to substances with the potential to cause occupational asthma should be prevented, or if that is not reasonably practicable, control exposure to prevent exposed workers from developing asthma. This applies to short-term high exposures as well as long-term exposures. If an individual develops occupational asthma, exposure must be controlled to prevent triggering further attacks. Suitable levels are likely to be well below any exposure limit.

Control approach R (respiratory protective equipment) with control approach 2 (engineering control) is recommended to control isocyanate in spray/bake processes.

Two-pack products may contain flammable solvent.

For environmental advice see Further information on back page.

Access

- ✓ Restrict access to trained staff who are under health surveillance.
- ✓ Keep members of the public away from all work with two-pack products.
- ✓ Display warning signs while spraying and baking are in progress.

Design and equipment

- ✓ Reduce exposure to isocyanate mist and vapour as far as possible.
- ✓ Use spray equipment that minimises the amount of paint mist.
- ✓ Use a spray/bake booth that runs under negative pressure, to prevent mist leaking into the workshop. Never spray in the open workshop.
- ✓ Make sure the booth is kept between 5 and 15 pascals (Pa) below atmospheric pressure when in use.
- ✓ Wire in the booth ventilation with the lighting circuit. You may need flameproof electrical fittings.
- ✓ Ensure that air-fed respiratory protective equipment (RPE) is worn for spraying.
- ✓ Fit a compressed air supply for RPE. Make sure the right amount of compressed air is supplied, and that it is fit to breathe.
- ✓ Set the booth extraction running before spraying or baking begins, and keep it running for at least 10 minutes after the job finishes.
- ✓ Discharge filtered, extracted air to a safe place in the open air, away from doors, windows and air inlets.
- ✓ Workers must keep their RPE on until they have left the booth.
- ✓ Keep people out of the booth during and after the bake cycle, until isocyanate vapour has cleared - 10 minutes or more.
- ✓ Consult a qualified ventilation engineer to design new control systems (see Control guidance sheet FD14).

Maintenance

- ✓ Follow instructions in maintenance manuals.
- ✓ Keep equipment in effective and efficient working order.
- ✓ If the extraction system is faulty, stop work until it is repaired.
- ✓ Change the filters as directed. Keep spares.
- ✓ Keep airline oil and water traps empty, and filters clean.

Examination and testing

- ✓ Look daily for signs of damage to the booth, eg door seals. Repair damage immediately.
- ✓ At least once a week, look for signs of damage to the ducting, fan and air filter or cleaner. Noisy or vibrating fans can indicate a problem. Check the pressure gauge works properly. Also check that the booth is not leaking air into the workplace - use smoke tubes.
- ✓ Check all recirculation ductwork for leaks at least once a month.

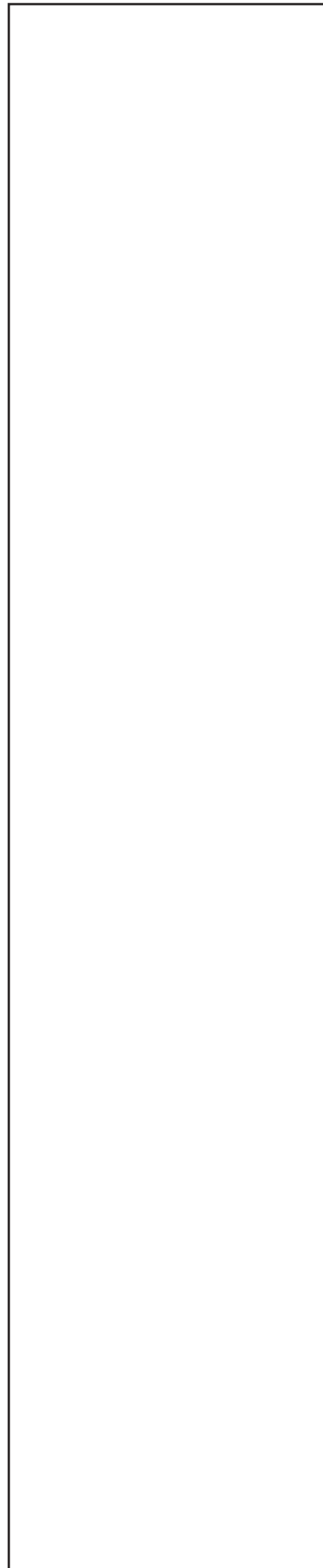
- ✓ You need to know the manufacturer's performance specification to know if extraction is working properly.
- ✓ If this information isn't available, hire a competent ventilation engineer to determine its performance.
- ✓ The engineer's report must show the target air speeds.
- ✓ Keep this information in your testing logbook.
- ✓ Get a competent ventilation engineer to examine the system thoroughly and test its performance at least once every 14 months (see HSE publication HSG54).
- ✓ Keep records of all examinations and tests for at least five years.
- ✓ Review records to see if there are failure patterns that make planning maintenance easier.
- ✓ Visually check compressed airlines for signs of damage before use.
- ✓ Check the airflow and air quality (according to BS4275) to air-fed RPE at least once every three months. For mobile compressors, also make these checks every time you move the compressor.
- ✓ Ensure that users examine their RPE thoroughly and test it works properly every time they use it.
- If everything is working properly, regular exposure measurement should not be needed. Use air monitoring to check the effectiveness of controls and biological monitoring to detect personal exposure for workers. Seek advice (see Further information).

Cleaning and housekeeping

- ✓ Keep the spray booth and surrounding areas clean.
- ✓ Clean general workrooms once a week.
- ✓ Deal with spills immediately - absorb liquid spills with granules and decontaminate. This needs coveralls, a respirator and single-use gloves.
- ✓ Decontaminate contaminated wipes before disposal.
- ✓ Dispose of wastes safely.
- ✓ Make sure the workers shower and change after a work session.
- Decontamination: ask your product supplier or read the safety data sheet. For two-pack isocyanate paints, you can use a solution of sodium carbonate (washing soda) in water, 50g per litre. Leave the mixture to stand for several days.

Personal protective equipment (PPE)

- ✓ Air-fed respiratory protective equipment (RPE) is always needed. Consult your supplier for advice.
- ✓ You need RPE with an Assigned Protection Factor (APF) of 20 or higher. Use a LDM3 air-fed half-mask with a visor, or LDH3 air-fed visor with APF 40.
- ✓ Air-fed half-masks with a visor allow quality inspection without removing RPE.
- ✓ Consider using a clear film over the visor to help remove paint overspray.
- ✓ Keep RPE clean and store it in a clean place - not in the mixing area or booth.
- ✓ Consider providing disposable coveralls. Discard these at the end of a day's work.
- ✓ Chemical protective gloves are needed. Use nitrile gloves. Single-use gloves are suitable.
- ✓ Throw away single-use gloves every time you take them off.
- ✓ Skin creams are important for skin protection and help in washing contamination from the skin. These are **not** 'barrier creams'. After work creams help to replace skin oils.



Health surveillance

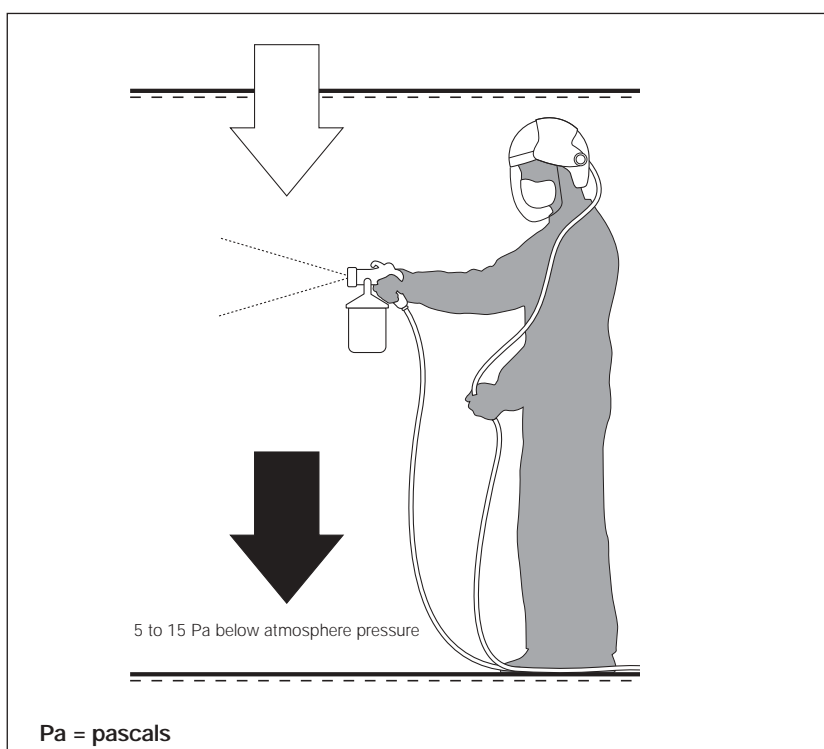
- ✓ Use health surveillance (see Control guidance sheet 402). There is a chance of asthma developing when using isocyanates, even with good controls in place.
- ✓ Use skin surveillance.
- ✓ Consult an occupational health professional (see Further information).

Training

- ✓ Tell your workers:
 - if two-pack paints and products contain isocyanates;
 - that isocyanates can cause asthma and dermatitis; and
 - it is often the mist that you can't see that gets breathed in.Tell them the signs to watch out for.
- ✓ Provide health and safety training. Include supervisors and managers. Ask your local Association of Colleges or your paint supplier for advice on training providers.
- ✓ Ensure training includes how to keep exposures low, how to check that the extraction system is working, how to use and look after PPE and RPE, and dealing with spills etc.
- ✓ Where you have to use strong hand cleaners, train workers to wash off residues with soap and water.

Supervision

- ✓ Ensure that everyone using two-pack products is properly trained.
- ✓ Instruct workers never to remove their RPE (eg lift their ventilated visor) for any reason, during this work.
- ✓ Check that the extraction is working properly, PPE is being used properly, and the rules on personal hygiene are being followed.
- ✓ Ensure the health surveillance programme is being carried out for everyone that needs it.
- ✓ Check the proper procedures for decontamination are being followed.



Further information

- *Maintenance, examination and testing of local exhaust ventilation* HSG54 (Second edition) HSE Books 1998 **ISBN 0 7176 1485 9**
- *An introduction to local exhaust ventilation* HSG37 (Second edition) HSE Books 1993 **ISBN 0 7176 1001 2**
- *The selection, use and maintenance of respiratory protective equipment: A practical guide* HSG53 (Second edition) HSE Books 1998 **ISBN 0 7176 1537 5**
- *Safety in motor vehicle repair: Working with 2-pack isocyanate paints* INDG388 HSE Books 2003 (single copy free or priced packs of 10 **ISBN 0 7176 2756 X**)
- Health and safety consultants: the BOHS Faculty of Occupational Hygiene keeps lists of qualified hygienists who can help you. Contact BOHS on 0133 229 8087 or at www.bohs.org/
- Occupational health professionals: details of doctors and nurses can be found in the Yellow Pages under 'Health and safety consultants' and 'Health authorities and services'. Also visit the NHS website at www.nhsplus.nhs.uk
- Biological monitoring for isocyanates: contact the Health and Safety Laboratory, Broad Lane, Sheffield, S3 7HQ (tel: 0114 2892000 or e-mail hslinfo@hsl.gov.uk)

Depending on the scale of work, releases into the atmosphere may be regulated within the pollution prevention and control (PPC) framework. You should consult your local authority or the Environment Agency. In Scotland, consult the Scottish Environment Protection Agency (SEPA). They will advise you if PPC legislation applies to your company, and about air cleaning and discharging emissions into the air. Otherwise, minimise emissions into the air.

Suppliers

- Smoke tubes are used to check that spray-bake booths and ductwork are not leaking air into the general workroom. The following makes are supplied in Britain:
 - Draeger (Draeger Safety UK Ltd);
 - Gastec (USA manufacturer, several UK suppliers).

Employee checklist

- Always follow the standard operating procedures.
- Keep unprotected people away from the work area while you are using two-pack products.
- Is the extraction switched on and working properly?
- Check the gauge.
- Look for signs of leaks, wear and damage.
- Check that your RPE works properly every time you put it on.
- If you find any problems, tell your supervisor. Don't just carry on working.
- Co-operate with health surveillance schemes.
- Use, maintain and store your PPE in accordance with instructions.
- Never remove your RPE or lift a ventilated visor for any reason, until you are well away from the work area.
- Clear up and decontaminate spills immediately. Clear them up as soon as possible and dispose of safely.
- Throw away single-use gloves every time you take them off.
- Wash your hands before and after eating, drinking, smoking and using the lavatory.
- Never use solvents to clean your skin.
- Use skin creams provided as instructed.



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