COSHH and the woodworking industries

Woodworking Sheet No 6 (rev)

Introduction

This information sheet is one of a series prepared by HSE's Woodworking National Interest Group. Its purpose is to provide advice to employers on the application of the Control of Substances Hazardous to Health (COSHH) Regulations 2002[1] to the woodworking industry.

What are the Regulations about?

The purpose of the COSHH Regulations is to protect people from the risk to their health caused by exposure to hazardous substances at work.

What is a substance hazardous to health?

For the purposes of COSHH, these are:

- chemicals labelled as 'very toxic', 'toxic', 'harmful', 'irritant' or 'corrosive';
- substances with occupational exposure limits (OELs) (listed in HSE Guidance Note EH40[2]);
- harmful micro-organisms;
- any kind of dust in a substantial concentration;
- any other substance which creates a risk to people's health.

Does COSHH apply to the woodworking industry?

Yes. Wood dust, resins used in some particle boards, adhesives, paint strippers, 2-pack polyurethane paints/varnishes, stains and wood preservatives are examples of substances used in the woodworking industry which may be hazardous to health (see Table 1).

How can employees be exposed to these substances?

Substances hazardous to health can enter the body by a number of routes. These include inhalation, ingestion and absorption through the skin.

What types of substance can be inhaled?

Wood dust is the most obvious example.[3] A maximum exposure limit (MEL) of 5 mg/m^3 has been set for both hardwood and softwood dusts. This means that exposure to wood dust must be reduced so far as is reasonably practicable, and must not in any case exceed the MEL. Particle boards, eg chipboard and medium-density fibreboard (MDF), are composed largely of softwood and the dust produced from machining them should be treated as such.

Other hazardous substances commonly found in woodworking which can be inhaled and have occupational exposure limits include 1,1,1-trichloroethane (in some adhesives); dichloromethane[4] (in paint strippers and adhesives); isocyanates (in 2-pack polyurethane paints and varnishes); certain glycol ethers which may be present in stains and varnishes; and arsenic pentoxide (in water-based wood preservatives).

Some organic wood preservatives contain substances which have occupational exposure limits. These include tributyl-tin-oxide (TBTO) and white spirit.

What could be ingested?

Wood preservatives are a good example. Ingestion is usually accidental and normally occurs because protective clothing is not used and personal hygiene is of a low standard. It can occur by biting contaminated fingernails, eating or smoking with contaminated hands or wearing contaminated clothing.

What could pass through the skin?

Some wood preservatives and many solvents, eg toluene and dichloromethane can be absorbed through the skin and cause a variety of ill-health effects. This route of exposure needs to be considered carefully, systems of work modified and protective equipment such as gloves, overalls etc provided as necessary.

What about skin contact?

Other substances cause local skin effects such as dermatitis, eg epoxy resins, timber preservatives and some woods. A high standard of hygiene and protective clothing is required.

Some people can be allergic or sensitised to certain substances. Does this have to be taken into account?

Yes. For example, some woods are recognised as causing skin or respiratory irritation. Iroko can cause dermatitis and western red cedar can cause nasal irritation or asthma in susceptible individuals. Other woods can also give rise to allergic reactions.[5]

Many types of glues and resins, and some isocyanate-based paints and varnishes have caused occupational asthma.[6]

What is the first thing that should be done to comply with COSHH?

Employers must carry out an assessment of all work activity which may expose their employees to any hazardous substances, and of all the precautions needed to protect their health. They must identify the hazard, the level of risk and

also any control measures needed. This will depend not only on the substance, but also on the working methods, route of exposure etc. The assessment must be recorded and regularly reviewed.

How do I go about making an assessment?

Follow the guidance in the COSHH Approved Code of Practice[1] and *A step by step guide to COSHH assessment*.[7] To encourage part-ownership and direct relevance to the actual working conditions the assessments should, ideally, be carried out by the employer's own staff. If you decide to get an outside consultant's help, satisfy yourself that they can carry out the work competently.

How am I expected to know what is hazardous?

Look at the labels on product containers and suppliers' health and safety sheets and check HSE guidance. Also check with your trade association, as many have prepared guidance for their members.

What should be done about the risks identified?

First consider whether you can eliminate the risk by substitution and/or changing your production or treatment process. Is the least hazardous product being used for the job? For example, it is often possible to substitute solvent-based products for water-based ones. Stains containing potentially harmful glycol ethers can be substituted by less harmful types.

If elimination of the risk is not possible then it must be adequately controlled by, whenever possible, enclosing the process or by providing local exhaust ventilation.

When is air sampling necessary?

You may need to do air sampling during the assessment if you are not sure whether employees' exposure to a substance is below the occupational exposure limit, or if you are not sure whether the control measures are working properly.

In the case of dust, there are other techniques which can help you decide whether the control is adequate. Look around the machine to observe the presence of dust. Use a dust lamp to find out if the dust is being captured by the exhaust extraction system.[8] Thoroughly examine the extraction system to see whether it leaks and meets its designed performance criteria.[9] You may need to do routine air sampling once controls are in place to check that they are working properly.[10,11]

Is dust extraction needed at woodworking machines?

Yes. At the great majority of woodworking machines the levels of dust produced, from both hardwood and softwood, will be above the MEL. Exposure to dust can be adequately controlled by a properly designed and maintained extraction system.[9,12,13] Always obtain a full commissioning report with performance figures if you have a new extraction system installed. That way you ensure that it performs adequately from the outset.

How about portable machines like orbital sanders and circular saws?

Yes. They too need control. Several suppliers of portable machines have designed them to be used with integral dust extraction or connected to mobile vacuum extractor units. Alternatively, down draught work benches or booths fitted with local exhaust ventilation can be used.

Can't employees just wear a respirator?

No. The COSHH Regulations require control of exposure to the hazardous substance at source wherever possible. If control cannot be achieved by engineering controls alone then personal protective equipment (PPE), such as dust respirators, have to be used. These should always be in addition to engineering controls and not substitutes for them.

PPE may be necessary during routine short-term maintenance operations, such as cleaning ventilation plant and bag filters or entry into treatment vessels. The initial selection of facepieces should include fit testing to ensure that the wearer has the correct device. More information on fit testing is provided in the COSHH ACOP[1] and in *Fit testing of respiratory protective equipment facepieces*.[14]

If the use of a respirator is necessary, which type can be used?

It should be selected from equipment that carries the European Community mark of conformity (the CE mark) and be appropriate to adequately control the exposure to the substance creating the risk.[15,16]

What is health surveillance?

Health surveillance is any activity which involves obtaining information about an employee's health and which helps to protect that employee from health risks at work.[17] A simple record must be kept of any surveillance carried out.

Under COSHH it is required where:

- employees are exposed to a substance linked to a particular disease or adverse health effect; ***and***
- there is a reasonable likelihood under the conditions of the work of the effect occurring; ***and***
- there are valid techniques for detecting the disease or adverse effect.

It may involve examinations by a doctor or a trained nurse. But in some cases trained supervisors could, for example, check employees' skin for dermatitis, or administer a questionnaire asking about breathing difficulties where the work involves substances likely to cause asthma.

The following are examples of situations where health surveillance may be appropriate:

- Exposure to substances of known systemic toxicity, eg organophosphorus and copper-chrome-arsenic wood preservatives or diethylene dioxide used for paint stripping. As well as keeping health records you

Table 1 Common hazardous substances in the woodworking industry

Substances	*Route of exposure/likely health risk*	*Typical jobs/process*	*Controls*
DUST: Hardwood Softwood	Inhalation, irritant will sometimes cause sensitisation (and rarely nasal cancer)	Machinery, sanding	Substitution of allergy-causing hardwoods. Enclosures with exhaust ventilation. Portable tools with dust extraction. Suitable respiratory protective equipment (RPE).
SOLVENTS: In many woodworking products including varnishes, paints, adhesives, strippers, thinners etc	Inhalation, skin absorption, dermatitis, ingestion	Many trades, particularly finishing. Spray application is high risk. Regular exposure increases risk	Substitute for solvent-free product where possible. Enclosures with exhaust ventilation. Suitable RPE (air-fed for spraying in enclosed spaces). Use of mistless/airless methods. Protective clothing including suitable gloves. Ensure good general ventilation. Washing facilities, barrier cream.
RESIN SYSTEMS: Isocyanates, eg 2-pack polyurethane paints/varnishes	Inhalation, skin absorption, ingestion, dermatitis and asthma	Surface coating	Enclosure with exhaust ventilation. Air-fed RPE for spraying. Protective clothing. Washing facilities. Health surveillance.
Epoxy	Inhalation, skin absorption, ingestion, dermatitis and asthma	Strong adhesive applications	Use least toxic material. Local exhaust ventilation. Good general ventilation. Protective clothing. Suitable RPE. Washing facilities, barrier cream.
TIMBER PRESERVATIVES: Organic-based containing TBTO	Ingestion, skin absorption, inhalation, dermatitis	*In situ* timber treatment. Preservation of timber. Handling treated timber.	Replace diseased timbers where possible. Use least toxic material. Enclosures with exhaust ventilation. Mechanical ventilation. RPE. Impervious gloves. One-piece overall and head cover. In confined spaces - breathing apparatus. Washing facilities. Skin checks. If necessary, biological checks. Handle only dry material.
Water-based containing chrome-arsenic	Ingestion, skin absorption, dermatitis	*In situ* timber treatment. Preservation of timber. Handling treated timber.	
GLYCOL ETHERS: Found in some stains and varnishes	Ingestion, inhalation, skin absorption	Surface coatings, eg stains	Use least toxic material. Local exhaust ventilation. Suitable RPE. Washing facilities.

should arrange for appropriate laboratory or clinical investigations, including biological monitoring, eg urine tests, for the presence of arsenic. This should be carried out by or under the supervision of a doctor.[18,19]

- Exposure to organic solvent-based preservatives. These substances can be taken into the body by inhalation or skin absorption. Health records are required and in certain circumstances biological monitoring may be needed.
- Exposure to substances known to cause occupational asthma and respiratory sensitisers, eg isocyanates, epoxy resin curing agents and western red cedar dusts.[20] Health surveillance will involve the keeping of health records as well as enquiries seeking evidence of respiratory symptoms.
- Exposure to substances known to cause severe dermatitis and skin sensitisation, eg epoxy resins and organic solvents such as dichloromethane or organic solvent-based wood preservatives. Skin inspections should be carried out at regular intervals by a responsible person.
- Exposure to substances which are known or suspected carcinogens, eg hardwood dust and inorganic arsenic compounds. In the case of hardwood dust, it is doubtful whether nasal cancer could be detected at an early enough stage for treatment to be effective. Health surveillance would be restricted to the keeping of health records.

  Note: Inorganic arsenic compounds found in wood preservatives can cause skin cancer and regular skin inspections may be necessary.

Will special training need to be provided?

Yes. Information, instruction and training is vital. Employers must provide training for employees who are exposed to hazardous substances at work. This should include the names of the substances employees work with or could be exposed to, the risks created by such exposure and access to any safety data sheets that apply to those substances. Employees should also be given the significant findings of the risk assessment so that they understand the nature and degree of risks to health which could arise as a consequence of exposure and the precautions which must be taken.

Emergency procedures

Where the quantity of each hazardous substance in the workplace presents more than a slight risk to employees' health, employers must prepare plans and procedures to deal with the increased risk that could arise from an accident, incident or emergency involving any of those substances. The COSHH ACOP[1] provides more information.

Reading list and references

1 *Control of substances hazardous to health. The Control of Substances Hazardous to Health Regulations 2002. Approved Code of Practice and guidance* L5 (Fourth edition) HSE Books 2002 ISBN 0 7176 2534 6

2 *Occupational exposure limits: Containing the list of maximum exposure limits and occupational exposure standards for use with the Control of Substances Hazardous to Health Regulations 1999* Environmental Hygiene Guidance Note EH40 (revised annually) HSE Books 2002 ISBN 0 7176 2083 2 and *Supplement 2003* HSE Books 2003 ISBN 0 7176 2172 3

3 *Wood dust: Hazards and precautions* Woodworking Information Sheet WIS1(rev1) HSE Books 1997

4 *Health risks during furniture stripping using dichloromethane (DCM)* Woodworking Information Sheet WIS19 HSE Books 1993

5 *Toxic woods* Woodworking Information Sheet WIS30 HSE Books 1995

6 *Preventing asthma at work. How to control respiratory sensitisers* L55 HSE Books 1994 ISBN 0 7176 0661 9

7 *A step by step guide to COSHH assessment* HSG97 HSE Books 1993 ISBN 0 7176 1446 8 (Currently being revised)

8 *Assessment and control of wood dust: Use of the dust lamp* Woodworking Information Sheet WIS12 HSE Books 1991

9 *Maintenance, examination and testing of local exhaust ventilation* HSG54 (Second edition) HSE Books 1998 ISBN 0 7176 1485 9

10 *Monitoring strategies for toxic substances* HSG173 HSE Books 1997 ISBN 0 7176 1411 5

11 *General methods for sampling and gravimetric analysis of respirable and inhalable dust* MDHS14/3 (Third edition) HSE Books 2000 ISBN 0 7176 1749 1

12 *An introduction to local exhaust ventilation* HSG37 (Second edition) HSE Books 1993 ISBN 0 7176 1001 2

13 LEV Woodworking Information Sheets WIS23, WIS24, WIS25, WIS26 HSE Books 1992

14 *Fit testing of respiratory protective equipment facepieces* Information Document HSE 282/28 (Available only on HSE's website: www.hse.gov.uk/coshh)

15 *The selection, use and maintenance of respiratory protective equipment: A practical guide* HSG53 (Second edition) HSE Books 1998 ISBN 0 7176 1537 5 (Currently being revised)

16 *Selection of respiratory protective equipment suitable for use with wood dust* Woodworking Information Sheet WIS14 HSE Books 1991

17 *Health surveillance at work* HSG61 (Second edition) HSE Books 1999 ISBN 0 7176 1705 X

18 *Occupational hygiene and health surveillance at industrial timber treatment plants* Woodworking Information Sheet WIS29(rev1) HSE Books 2002

19 *Arsenic and its compounds: Health hazards and precautionary measures* Environmental Hygiene Guidance Note EH73 HSE Books 1997 ISBN 0 7176 1340 2

20 *Health surveillance and wood dust* Woodworking Information Sheet WIS33 HSE Books 1997

Further information

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This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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