



Controlling Exposures to prevent occupational lung disease in the construction industry

Carpenter/Joiner

HAZARDS AND RISKS

The biggest respiratory ill health risk to woodworkers comes from inhaling wood dust. Carpentry, joinery and shop fitting work typically involves cutting, shaping and fixing timber and wood pieces using saws, planes, chisels and other power and hand tools, all of which generate wood dust, as do tasks such as sweeping and cleaning. These workers can also be at risk through inhaling solvents and isocyanates from adhesives, paints, stains and varnishes that are used to fix and treat wood products.

Wood dust

Wood can be in many forms such as softwood and hardwood, and wood-based products such as MDF and chipboard. Exposure to all types of wood dust can lead to the development of asthma which is a serious, debilitating, and sometimes life-limiting condition, and can also trigger asthma attacks in existing asthma sufferers. Hardwood dusts are listed in Schedule 1 of COSHH as carcinogenic and can cause a rare form of nasal cancer. More rarely, there is an increased risk of developing hypersensitivity pneumonitis (a disease which can cause progressive lung damage) when working with some specific woods (eg. western red cedar, iroko, ramin, oak or mahogany). Exposure to any type of wood dust can also cause irritation, allergic rhinitis (runny nose) and impaired lung function. Wood dust exposure may also cause dermatitis. The dermatitis risk is high for softwoods.

Resins, solvents & isocyanates

Inhaling solvents can lead to irritation, dizziness and drowsiness. Exposure to isocyanates can cause allergic rhinitis and asthma. These workers can also be at risk through inhaling solvents and isocyanates from adhesives, paints, stains and varnishes that are used to fix and treat wood products. Resins within the MDF may include urea-formaldehyde. This may emit free formaldehyde although boards made within the EU at levels of formaldehyde class E1 are thought to be insignificant (as the resin is fully reacted).

CONTROL OPTIONS

Elimination/prevention

- Use pre-cut materials, to eliminate the need to cut wood on site, wherever possible.
- Use less toxic materials/substances, eg: avoid high risk woods (such as Western Red Cedar); use solvent-free products, etc.
- Purchase 'no added formaldehyde' MDF board or low-emission MDF board if practicable to do so. Formaldehyde is classified in the UK as a carcinogen

Engineering controls

- Use powered hand tools that feature integrated dust extraction (or "on tool" dust extraction).
- Use local exhaust ventilation (LEV) for bench or semi-permanent machines; stand-alone dust collectors can be considered for occasional use.
- Use dustless cleaning methods eg: H or M class ATEX-approved vacuum cleaner (HEPA filter) with antistatic hoses.

Safe working methods

- Ensure good general ventilation to the work area; work outdoors if feasible.
- Set up dedicated work areas with restricted access to other workers.
- Clean up regularly and ensure vacuuming or wet cleaning; avoid dry sweeping or use of compressed air to remove dust from clothing.
- Minimise dust release eg. through damping down of work areas.
- Use roller/brush application of coatings rather than spraying if feasible.

PPE

- Respiratory protective equipment (RPE) may be required to supplement the control measures described above. RPE must be worn if, for example, LEV cannot be used when operating power saws or machines, or hand sawing is carried out in enclosed or poorly ventilated areas. As a minimum, a FFP3 disposable mask (APF20) should be used or PAPR (of TH2 or higher classification) if the task is undertaken for periods over one hour.
- All staff required to use RPE should be subject to face fit testing to ensure the RPE selected provides each individual with the anticipated level of protection.
- Also, a fit check must be performed before each use (for tight-fitting RPE).

Preferred control methods

- Outdoor hand sawing, on-tool dust extraction and LEV for machinery, in dedicated work areas and use of industrial vacuum cleaners.

MANAGING THE RISK

Training & communication, supervision, maintenance & testing of controls and air monitoring* are all vital aspects of managing the risk, in addition to health surveillance which can be a requirement in certain circumstances.

See our introductory [Respiratory Health Hazards in Construction Fact Sheet Series: Overview](#) for more information about what things to consider and implement.

Air monitoring*

Air monitoring is a specialist activity. It may be needed as part of a COSHH assessment, as a periodic check on control effectiveness and to assess compliance with relevant WELs, or where there has been a failure in a control (for example if a worker reports respiratory symptoms). A qualified Occupational Hygienist can ensure it is carried out in a way that provides meaningful and helpful results.

The decision to undertake exposure monitoring should be made in accordance with HSE's monitoring strategies outlined in HSG173. In some situations, qualitative or semi-quantitative methods may be suitable. See also COSHH regulation 10 ACOP which details when exposure monitoring is necessary or unnecessary.

Also, see HSE leaflet G409, Exposure measurement: Air sampling. www.hse.gov.uk/pubns/guidance/g409.pdf



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WORKPLACE EXPOSURE LIMITS (WELs) & EXPOSURE LEVELS

Agent or substance	Control/Exposure Limit	Comments
Hardwood Dust	3 mg/m ³ (8 hour TWA)	Capable of causing cancer. Capable of causing occupational asthma. If hardwood dusts are mixed with other wood dusts, the WEL shall apply to all the wood dusts present in that mixture.
Softwood Dust	5 mg/m ³ (8 hour TWA)	Capable of causing occupational asthma. If softwood dusts are mixed with hardwood dusts, the WEL for hardwood dusts shall apply to all the wood dusts present in that mixture.
Other substances	<p>The following are example WELs of hazardous substances associated with wood work such as within varnishes or paints.</p> <ul style="list-style-type: none"> • Isocyanates, 0.02 mg/m³ (8 hour TWA), capable of causing occupational asthma. • Acetone, 1210 mg/m³ (8 hour TWA). • Formaldehyde, 2.5 mg/m³ (8 hour TWA), capable of causing occupational cancer. • Toluene, 191 mg/m³ (8 hour TWA). 	<p>Adhesives, paints and paint strippers, varnishes and wood preservatives may all contain substances which have WELs; refer to Safety Data Sheets (SDSs) for the substances present and to HSE's guidance note Workplace Exposure Limits EH40/2005:</p> <p>www.hse.gov.uk/pubns/priced/eh40.pdf</p>

Further information

- Wood dust: Controlling the risks: www.hse.gov.uk/pubns/wis23.pdf
- Wood dust: Selecting suitable respiratory protective equipment: www.hse.gov.uk/pubns/wis14.pdf
- Controlling construction dust with on-tool extraction: www.hse.gov.uk/pubns/cis69.pdf
- COSHH Essentials: Circular bench saws: <https://www.hse.gov.uk/pubns/guidance/wd2.pdf>
- COSHH Essentials: Cross-cut saws: <https://www.hse.gov.uk/pubns/guidance/wd3.pdf>
- On video: How to improve dust control at circular saw benches: https://youtu.be/_4kyohTbNTQ