

Manufacturing Sector Work Plan 2022-23:

Occupational lung disease (OLD) caused by wood dust in wood working and furniture making industries

Open Government status: Open

Audience: FOD Inspectors, Visiting Officers, Occupational Hygienists, Occupational Health and Process Safety Inspectors

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Inspection programme

1.1. What are we inspecting and why?

Risk controls for asthmagenic and carcinogenic wood dust are long-established in guidance, yet we routinely find poor compliance in the woodworking industry. Robustly enforcing the expected standards and taking action on the underlying

causes of poor risk control is justified and necessary to protect lives and livelihoods in line with EPS/EMM.

This intervention is aimed at delivering sustained improvements in the control and management of risk and will review whether dutyholders across the industry can learn lessons and sustain reasonable risk controls expected.

1.2. What is the extent of the problem?

Occupational Lung Disease (OLD) causes the death of 12,000 people in GB annually. There are 18,000 new cases of OLD per year that are caused or exacerbated by work and 400,000 working days are lost per year.

OLD causes premature death, significantly impacts the quality of people's lives and has a huge cost on the GB economy. Workers who develop asthma and/or lung disease through exposure to a substance at work often need to change career or fall out of work all together.

Wood dust is produced or process generate during wood working and furniture making. Specific examples of OLD in the wood working industry include:

- Sino-nasal cancer from exposure to hardwood dust
- Asthma from exposure to softwood and hardwood dust

Anecdotal findings from the recent Woodworking Evaluation Visits would suggest that this is still a problem area for the industry with numerous examples of poor compliance being identified.

1.3. What must be covered at the inspections?

- How risk controls are managed to ensure they are and remain effective, including competency, instruction, supervision, and monitoring
- Measures for adequately controlling workers' exposure to wood dust from production activities and how cleaning is done
- Any matters of evident concern (MEC), including machinery guarding/braking/tooling – see [Appendix 5.1](#)
- Measures for protecting workers' hearing where exposures reach or exceed the weekly Upper Exposure Action Value (UEAV) - see [Appendix 5.2](#)
- Any matters of potential major concern (MPMC), including fire and explosion – see [Appendix 5.3](#)

1.4. What sectors and topics are we inspecting and when?

Sector	Health topic(s)	When
Woodworking	Wood dust, Noise	2022/23

Further information on targeting of premises including SIC codes is contained in the *Targeting and Intelligence Guide*.

1.5. Enforcement and Application of the Enforcement Management Model (EMM)

Prohibition Notices should be served for risk of serious personal injury from inadequate guarding in line with the expectations of the Enforcement Policy Statement (EPS). Inadequate protection from machinery risks and fire and explosion risks also leads to a risk of serious personal injury.

Exposure to a carcinogen or asthmagen and exposure to noise above the UEAV without an effective hearing protection programme are risks of **serious health effects**. Adequate controls in line with expected standards should reduce the benchmark risk to **nil/negligible**

The controls expected are **established standards** in [guidance](#).

Dutyholders who do not meet these expected standards may be considered to be **seeking economic advantage** from avoiding such well known and long established minimum legal requirements.

The **standard of general conditions** is an important factor when considering the overall standard of health and safety management:

- **Good** - where full compliance is found across the site;
- **Reasonable** - where only limited minor issues are identified across the site (e.g. issues which can be dealt with through advice only);
- **Poor** – where multiple issues are identified across the site (e.g. where multiple material breaches are identified).

Enforcement action should seek to achieve sustained compliance across the range of risks found and, therefore, should serve as a deterrent to other dutyholders in the woodworking industry.

Enforcement should also be applied to underlying management issues where there is significant evidence of poor control or a failure to sustain compliance.

2. Support and Guidance Available

Specialist Support type	Relevant specialist
Control strategies and enforcement	Occupational Hygiene Inspectors
Health surveillance and diagnosis	Occupational Health Inspectors
Industry standards and enforcement	Manufacturing Sector: David Butter, Scott Wynne
Noise exposure and hearing protection	Noise and Vibration Specialist Inspectors

Other Important Guidance for Inspections
Topic-specific self-learning presentations e.g. Health risks in woodworking – their control and IEE's (FISH) Woodworking intervention Q&A (HEALTH) (SAFETY) Woodworking Powerpoints (HEALTH) (SAFETY) (NOISE) (DCM)
COSHH Essentials guidance for woodworking (HSE Website) Wood dust: Controlling the risks (WIS23) (HSE Website)
Noise – Guidance on the Control of Noise at Work Regulations (L108) (HSE Website) Noise – Topic Inspection Pack (HSE Website)
Enforcement Management Model (EMM): Application to Health Risks (HSE Website)
Health and Safety Management – OG: Inspection Procedure 9 June 2018 (FISH) The Management of Health and Safety at Work Regulations 1999 (Legislation.gov.uk) Control of Substances Hazardous to Health Regulations 2002 (ACOP – L5) (HSE Website) Provision and Use of Work Equipment Regulations 1998 (ACOP – L22) (HSE Website) Dangerous Substances and Explosive Atmospheres Regulations 2002 (ACOP – L138) (HSE Website) HSG65 – Managing for Health and Safety (HSE Website)

3. Recording the inspections

Woodworking inspections must be recorded using the Woodworking Reporting Form, available on the Woodworking Inspections - SharePoint Site.

Woodwork Inspection Form

Capturing this information is essential to enable us to effectively analyse the inspection outcomes and determine the impact. You should answer **all** of the questions

You should create entries for each risk area inspected, providing a rating within the 'Management of Risk' drop down box, recording any enforcement taken in the 'Enforcement Outcome' drop down box, and providing details of your inspection in the 'Risk Issue Description' free text box.

The questions which follow the risk areas should be answered on the basis of the overall compliance found at the site. For example, if there are two LEV systems at a site, one of which has a current TExT and the other does not, the answer to the question 'LEV is undergoing regular TExT and has passed' would be **NO** as overall, the site is not compliant.

Please send examples of good or poor control (with photographs and/or video) to Sector.

4. Health and Safety

Industry-specific health and safety information is detailed in the sector specific appendices below. General health and safety information for visiting staff is on the intranet.

Appendix 5.1 Industry specific information, Initial Enforcement Expectation (IEE) tables, examples of Matters of Evident Concern (MEC) and safety priorities for woodworking

Introduction
HSE has found the woodworking industry difficult to engage with at a national level, as the industry's trade associations cover only a relatively small percentage of workplaces. Approximately 238,000 carpenters and joiners are employed in the woodworking sector. Approximately 75% of these are estimated to be micro-businesses of less than 10 employees. Wood dust can cause: • asthma – both hardwoods and softwoods are asthmagens and carpenters and joiners are 4 times more likely to develop asthma than other workers • nasal cancer – hardwoods are classed as a carcinogen • dermatitis – caused by skin contact with wood dusts, lichen, sap and chemicals including glues, adhesives and coatings. Adequate control of wood dust is achieved when the eight principles of good control practice are met (as set out in) by applying all the expected controls established in COSHH essential sheets, or by using other equally effective measures to ensure exposure is being controlled to as low as reasonably practicable. Although the health effects from exposure to hardwood, softwood and composite woods are different (and the specific WELs are different), the measures required to adequately control exposure do not differ by the type of wood being machined.
Health and safety
Where appropriate, inspectors should follow the company's procedures when visiting and ensure appropriate PPE for the premises is worn e.g. safety footwear, eye protection, hearing protection.
Inspection
Exposures to wood dust can occur not only when machining wood, particularly sanding and sawing, but also when cleaning. It has been common practice in the industry to dry sweep or use an airline to blow down machinery, surfaces and clothing which increases the amount of airborne dust and potentially can increase the exposure of workers. Wood dust can be readily controlled by the use of LEV however, experience has shown there are often issues with the LEV such as being poorly maintained, badly designed or not being operated correctly. Follow protocol under '1.3.What must be covered at the inspections?' supplemented by consideration of: • Management and workers knowledge of the risks from wood dust • Training so workers know the risks of wood dust and understand how to protect themselves • High standards of housekeeping e.g. removing dust from machinery and not having piles of wood dust around the workplace • Cleaning methods that reduce the risk of dust exposure e.g. vacuuming instead of dry sweeping or blowing down
Health Priorities
• Machining activities • Sanding: belt sanders can produce high levels of dust, as can sanding with hand-held power tools • Cleaning down activities: dry sweeping and blowing down with airlines should not occur • Poor/inadequate LEV design and capture • No LEV, including on-tool extraction, provided for dusty activities • Poorly maintained LEV • Selection, use, storage and maintenance of suitable RPE • Occupational dermatitis risks from handling wood materials and chemicals • Health surveillance • Spraying of adhesives containing DCM in poorly ventilated/enclosed spaces

Safety Priorities

It is evident that machinery guarding continues to be an issue in the industry, with a significant proportion of enforcement resulting from unguarded or poorly guarded machines, or poorly maintained guards/safety devices.

There is a long incident history in this industry, particularly with circular saws, vertical spindle moulders and surface planers contributing a significant proportion of those incidents. Inspectors are also still discovering woodworking machines which are either not adequately braked to bring the dangerous parts to a stop within 10 seconds ([Woodworking Information Sheet 38](#)), or which are not fitted with chip-limited or limited-projection tooling to mitigate the result of inadvertent contact with dangerous parts of the machine during normal operation ([Woodworking Information Sheet 37](#)).

The requirements for machinery braking and chip-limited/limited-projection tooling have been in place since 2005 and 2003 respectively. Accordingly, a robust enforcement approach is encouraged where such issues are identified. Please see the Woodworking Safety IEE's for further details.

[The Manufacturing Sector Plan](#) details HSEs' safety priorities for the Sector. These safety issues are the most common causes of safety-related deaths and serious injuries in the Sector. They are:

- The movement and storage of heavy loads
- Maintenance activities: including issues of access (fall from height) and machinery intervention

Although these safety priorities are not a specific focus of this inspection programme, visiting staff should be aware these issues may well manifest as MECs.

With regards to MPMC's, fire and explosion remains a significant risk in all woodworking premises due to the presence of significant amounts of combustible materials, and the potential for large amounts of process generated dust.

Guidance

Presentation giving refresher briefing on woodworking plus IEE tables below.

- Woodworking – Health Powerpoint (FOD SHAREPOINT)
- Woodworking – Safety Powerpoint (FOD SHAREPOINT)
- Woodworking intervention Q&A - Health (FOD SHAREPOINT)
- Woodworking intervention Q&A – Safety (FOD SHAREPOINT)
- [Wood dust HSE website](#)
- [Woodworking – COSHH e-tool](#)
- [Wood dust - Controlling the risk \(WIS 23\)](#)
- [Local exhaust ventilation \(LEV\)](#)
- [Clearing the air - A simple guide to buying and using local exhaust ventilation \(INDG 408\)](#)
- [COSHH and woodworkers - key messages](#) – includes links to the 'COSHH Essentials web tool' sheets numbers 1-9

Contacts

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Woodworking health IEEs			
Task	Situation	IEE	Comment
Use of bandsaw, circular saw, crosscut saw, chop saw, wall saw, surface planer, overhead router, CNC router or fixed sanding machine	No LEV (<i>Reg 7(1) COSHH</i>) LEV inadequately designed (<i>Reg 7(1) COSHH</i>) LEV poorly maintained (<i>Reg 9(1) COSHH</i>) LEV poorly operated (<i>Reg 8(1) COSHH</i>) AND/OR No RPE (<i>Reg 7(1) COSHH</i>), or RPE unsuitable (<i>Reg 7(1) COSHH</i>) RPE poorly stored (<i>Reg 9(5)(a) COSHH</i>) RPE poorly used (<i>Reg 8(1) COSHH</i>)	IN*	- Both LEV and suitable RPE (minimum APF of 20 e.g. FFP3) are required to achieve adequate control on these machines. - Inadequate LEV evidenced by visible settled fine dust on workplace surfaces and visible airborne dust emanating from the machine: - Design issues include hood and/or duct being too small to adequately capture and transport the wood dust generated. - Inadequate maintenance may include signs of damage to flexible ducting and hoods. This may extend to signs of ineffective repairs. Baffles seized up, preventing the system being properly balanced. - In terms of incorrect operation, LEV hood and baffles are not correctly adjusted to effectively capture the wood dust. Baffles that are hard to open / close suggest failure to routinely operate the LEV properly. Note where any of these machines are fully enclosed with adequate LEV, such that any dust produced is adequately captured then RPE may not be required. These machines have been grouped together as they would <i>normally</i> be fitted with fixed LEV. *Note Prosecution should be considered where the risk gap is 'Extreme', for example where LEV is absent or ineffective and/or dust is not captured, visible in the air and on surfaces.

Use of powered hand-sander	No on-tool extraction/portable LEV (Reg 7(1) COSHH) AND/OR No RPE (Reg 7(1) COSHH), or RPE unsuitable (Reg 7(1) COSHH) RPE poorly stored (Reg 9(5)(a) COSHH) RPE poorly used (Reg 8(1) COSHH)	IN*	• Both on-tool extraction/portable LEV and suitable RPE (minimum APF of 20 e.g. FFP3) are required to achieve adequate control on these machines. • Inadequate on-tool extraction evidenced by visible settled fine dust on workplace surfaces and visible airborne dust emanating from the machine: ○ Design issues include ducting being too small or extraction having insufficient power/capacity to adequately capture and transport the wood dust generated. ○ Inadequate maintenance may include signs of damage to on-tool extraction adapters and flexible ducting. This may extend to signs of ineffective repairs such as the use of tape to secure/seal ducting. ○ In terms of incorrect operation, on-tool extraction is not switched on, ducting is not free from kinks/knots. • Inadequate portable LEV evidenced by visible settled fine dust on workplace surfaces and visible airborne dust emanating from the machine: ○ Design issues include hood and/or duct being too small to adequately capture and transport the wood dust generated. ○ Inadequate maintenance may include signs of damage to flexible ducting and hoods. This may extend to signs of ineffective repairs. Baffles seized up, preventing the system being properly balanced. ○ In terms of incorrect operation, portable LEV hood and baffles are not correctly adjusted to effectively capture the wood dust. Baffles that are hard to open / close suggest failure to routinely operate the portable LEV properly. *Note Inspectors should assess the specific scenario (e.g. duration of task, spread of dust, position of other workers etc.) as there <i>may</i> be occasional short duration tasks where, provided the operator is wearing suitable RPE, that no on-tool extraction is justified. For example, sanding infrequently and of short duration with the operator wearing suitable RPE, but only where the spread of dust does not spread around the workplace, potentially affecting other workers who do not have suitable RPE.
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Manual sanding (e.g. use of sandpaper, sanding blocks etc.)	No RPE (Reg 7(1) COSHH), or RPE unsuitable (Reg 7(1) COSHH) RPE poorly stored (Reg 9(5)(a) COSHH) RPE poorly used (Reg 8(1) COSHH)	IN	RPE (minimum APF of 20 e.g. FFP3) should be worn
Use of vertical spindle moulder.	No LEV (Reg 7(1) COSHH) LEV inadequately designed (Reg 7(1) COSHH) LEV poorly maintained (Reg 9(1) COSHH) LEV poorly operated (Reg 8(1) COSHH)	IN	Evidenced by visible settled fine dust on workplace surfaces and visible airborne dust emanating from the machine: • LEV hood may form part of guarding to prevent access to dangerous parts. • Design issues include hood and/or duct being too small to adequately capture and transport the wood dust generated. • May include signs of damage to flexible ducting and hoods. This may extend to signs of ineffective repairs. Baffles seized up, preventing the system being properly balanced. • LEV hood and baffles are not correctly adjusted to effectively capture the wood dust. Baffles that are hard to open / close suggest failure to routinely operate the LEV properly Note – RPE is normally not required, however, it may be needed for particularly dusty jobs. Please refer to the RPE section below.
Use of woodworking machine where LEV is required (see above)	Lack of current thorough examination and test (TExT) for the LEV* (Reg 9(2) COSHH)	IN	Lack of thorough examination and test may be indicative of a poor standard of LEV maintenance. A TExT will only evidence that the LEV was working efficiently and in good repair at the time it was carried out. TExT will NOT give assurance that the LEV is suitable designed and achieves an adequate level of control. *Note TExT is required for both fixed and portable LEV systems as well as vacuums where used for on-tool extraction.
Cleaning of surfaces	Sweeping or using compressed air to clear wood dust (Reg 7(1) COSHH)	IN	A dust class M or H-type vacuum cleaner, or a suction hose attached to the LEV should be used to clear wood dust. Dry sweeping or using compressed air are not acceptable methods for the collection or clearing of wood dust. Larger wood chips or offcuts can be shovelled or alternatively pre-filters/mesh can be used to prevent blockage issues on vacuum cleaners and LEV attachments. (please refer to the Woodworking Q&A - Health document for further information)

Changing dust extraction bags or maintaining woodworking machines	No RPE (<i>Reg 7(1) COSHH</i>), or RPE unsuitable (<i>Reg 7(1) COSHH</i>) RPE poorly stored (<i>Reg 9(5)(a) COSHH</i>) RPE poorly used (<i>Reg 8(1) COSHH</i>)	IN	RPE (minimum APF of 20 e.g. FFP3) should be worn
RPE	No RPE (<i>Reg 7(1) COSHH</i>), or RPE unsuitable (<i>Reg 7(1) COSHH</i>) RPE poorly stored (<i>Reg 9(5)(a) COSHH</i>) RPE poorly used (<i>Reg 8(1) COSHH</i>) Lack of current TEXt for reusable RPE (<i>Reg 9(3) COSHH</i>)	IN	Inadequate RPE evidenced by: • Incorrect type of filters used. • Inadequate APF selected (not minimum APF of 20 e.g. FFP3). • Tight fitting RPE not face-fit tested. Incorrectly used RPE evidenced by: • Operators' facial hair affected seal of mask. • Seal affected by other PPE. Incorrectly stored or maintained RPE evidenced by: • No clean storage arrangements for RPE. • RPE dirty or with partially clogged filters. • Reusable RPE not regularly checked and/or replaced.
Dermatitis	Repeated and/or prolonged exposure of skin to: • Wood dust and sap • Chemicals including glues, adhesives and coatings (<i>Reg 7(1) COSHH</i>)	IN	There is evidence of dermatitis in this industry from exposure to wood dust and sap as well as exposure to chemicals including glues, adhesives and coatings. For chemicals contained within products, you should check SDS's for Hazard Statements (e.g. H315 Causes skin irritation, H317 May cause an allergic skin reaction). The dutyholder must identify and implement suitable measures to prevent or control the risk, such as: • avoiding skin exposure to wood dust or sap by using machinery / tools to move wood, apply varnishes etc. • protecting the skin using suitable gloves for the dermatitis risk from dust, sap, adhesives and coatings (the risk of entanglement should be assessed for any manual machining operations) • providing adequate hand washing facilities and providing moisturising creams

Health surveillance	No adequate Health Surveillance programme in place (<i>Reg 11(1) COSHH</i>)	IN	There is evidence of asthma and dermatitis in this industry from exposure to wood dust and some glues, adhesives and coatings, and from handling wood that is not fully dried. There is also evidence of hearing damage being suffered by woodworkers. PPE cannot be guaranteed to be fully effective in avoiding exposure. Unless the risk assessment demonstrates occupational asthma, dermatitis and hearing damage are not likely to occur under the particular work conditions and there is no residual risk following the implementation of control measures, there should be a health surveillance programme in place. Duty holders should seek advice from an occupational health professional (doctor or nurse) who has the relevant competence, skills and experience for the health risks in wood working. Health surveillance would normally consist of: • a questionnaire and lung function assessment for all workers who could breathe in substances that can cause occupational asthma. • a questionnaire and skin inspection for workers who could have repeated skin contact leading to dermatitis, including those who wear gloves/PPE (e.g. latex, nitrile) as a control measure. • involves testing the hearing of workers who have regular daily or weekly exposure to noise levels at or above the upper exposure action value of 85dB(A) or who are classed as vulnerable by a health professional.
Spraying of adhesives containing Dichloromethane (DCM) in poorly ventilated and/or enclosed spaces	No LEV and no breathing apparatus (<i>Reg 7(1) COSHH</i>)	PN Consider PR	Exposure to DCM can cause narcotic symptoms (headache, lethargy and lack of coordination). Higher exposures can lead to impaired consciousness and could prove fatal. The benchmark standards for controlling the risks associated with DCM are set out in the information sheet DCM1. Some adhesives used in the woodworking industry contain DCM, and there appears to be an increase in the number of spray canisters being found in workplaces Where spraying is taking place in a larger, well-ventilated workshop, there may not be a risk of serious personal injury however, further action may be required to achieve adequate control. If unsure, please seek the advice of an Occupational Hygiene Specialist Inspector.

Woodworking safety IEEs			
Task or machine	Situation	IEE	Comment
Braking Use of circular saws, dimension saws, powered or hand-fed cross-cut saws, single/double end tenoners, narrow bandsaws, re-saws, vertical spindle moulders, hand-fed routers, thicknessers, surface planers and combined planer/thicknessers.	The rundown time for the tooling exceeds 10 seconds	IN*	The requirement for stop controls was introduced in PUWER 1998, Regulation 15 which requires machines to be brought to a 'safe condition in a safe manner'. This was further defined in European Standards, requiring the amount of time which the tooling of a machine should come to a stop as "within 10 seconds". The PUWER ACoP set a timetable for providing braking, and all of the machines listed in this section should have been fitted with a braking system (where appropriate) from December 2005 onwards. All new machinery should be supplied with some form of automatic braking system where necessary when contact with tooling is possible during rundown. In each case, the IEE is IN unless: • There is no safety benefit from braking a machine e.g. – the machine is within an interlocked enclosure with guard locking or there is no access to the blade during run down; • An existing manual brake which is effective to bring the machine to a stop within 10 seconds; • Rundown time is less than 10 sec; Further guidance on retrofitting of braking is contained in Woodworking Information Sheet 38. *Note: Where multiple machines are found to be non-compliant, or where multiple other breaches are identified at the site, then PR should be considered.

Tooling Use of hand-fed (or demountable power fed) vertical spindle moulders, single-end tenoners, rotary knife/copy lathes and any other hand-fed machine which uses a moulding head/cutter	The machine is fitted with profiling/moulding tooling which is not of the limited cutter projection type	PN*	The requirement for limited cutter projection tooling (sometimes referred to as chip thickness limitation tooling) has been in place since December 2003 and is set out in the PUWER ACoP. Regulation 4 of PUWER 1998 requires work equipment to be constructed or adapted to be suitable, in respect of health and safety, for the purpose for which it is to be used. The IEE for non-limited cutter projection tooling is a PN on that tooling unless: The machine is fully enclosed with suitable fixed/interlocked guarding and that access is not possible during machining operations (for example CNC machines where access to the dangerous parts is not required during normal operation); The design and construction of limited cutter projection tooling must meet the requirements of BS EN 847-1 (the dutyholder should be able to confirm this with their supplier, or by consulting the sales literature/information provided with the tooling). Further guidance on limited cutter projection tooling is contained in Woodworking Information Sheet 37 Inspectors should also be aware of the possibility that older style cutters (sometimes referred to as the 'knife') can potentially be retrofitted into newer tool bodies. This can lead to a risk of cutter ejection where the cutter does not have the means to be properly secured. If you identify any tooling which you think may contain retrofitted cutters, please refer this to the Woodworking Sector. *Note: where multiple machines are found to be using non-compliant tooling, or where multiple other breaches are identified at the site, PR should be considered.
Circular Saw Introduction to woodcutting machinery – Circular saw bench (hse.gov.uk)	Saw not fitted with a suitable top guard and riving knife If saw in use at time of inspection without one or both of these features	PN Reg 11 PUWER Consider PR	A circular saw should be fitted with a strong and adjustable top guard that is large enough to enclose the exposed part of the blade during cutting. The riving knife should be rigid and set accurately in line with the saw. The inner face should follow the contour of the largest saw blade designed for use on the machine and at table level should be set within 8mm of the edge of the saw blade. Circular saw benches - Safe working practices WIS16 (hse.gov.uk) The top guard often also functions as an extraction hood. If the top guard is not fitted then you should also consider control of exposure to wood dust. If the riving knife and/or top guard are loose or incorrectly adjusted, consider whether training and supervision are adequate

	Second worker at rear of blade taking off cut material	IN Reg 11 PUWER	If the second worker can reach the saw blade from the take off position at the rear of the blade then an extension table is required to distance them from the blade. Guidance para 111 Safe use of woodworking machinery ACOP L114
Manual Cross Cut Saw Introduction to woodcutting machinery – Cross-cut saw (hse.gov.uk)	No adjustable nose guard	PN Reg 11 PUWER	An adjustable nose guard is required that prevents access to the front edge of the blade above the height of the work piece. The nose guard should be adjustable down to within 12mm of the work bench Safe use of manually operated cross-cut sawing machines wis36(rev1) (hse.gov.uk) If the nose guard is present but incorrectly adjusted to its maximum opening, consider whether training and supervision are adequate
	Saw will pull out beyond the limit of the table	PN Reg 11 PUWER	The saw blade should not be able to be pulled out beyond the limit of the workbench. If immediate adjustments cannot be made to limit the extent of the movement then a PN should be considered. An extended table can be fitted to the front of the work bench to achieve the same result.
	Access to the blade when it is in the rest (behind the fence) position or the return device does not work when the saw is released	PN where access to blade is foreseeable IN where housing is incomplete Reg 11 PUWER	There should be no access to the saw blade when it is in the rest (behind the fence) position. On older machines, this can be achieved by providing a saw housing into which the saw returns automatically. This can be by either a spring-assisted return or counter balance device. This return device will also prevent the risk of the saw unit travelling forward from its rest position. Where a return device is used, to prevent the risk of 'bounce back' towards the operator some form of impact absorption material may be required. The saw housing often also functions as an extraction hood. If the housing is incomplete or open then you should also consider control of exposure to wood dust.
	Where a safe rest position cannot be created and run down time is more than 10 seconds	IN Reg 15 PUWER	Where the saw cannot return to a safe rest position, an efficient brake, DC injection or manual, that stops the saw within 10 seconds must be fitted. ACOP para 138 Safe use of woodworking machinery ACOP L114 It can be difficult to brake some older machines, see the guidance in Retrofitting woodworking machine brakes WIS38 (hse.gov.uk)
Chop Saw (Snipper or Mitre Saw)	Self closing guard missing or stuck in the open position	PN Reg 11 PUWER	The upper part of the blade should have a fixed guard which extends to at least the saw spindle. There is no access to the cutting part of the blade due to a self-closing guard. When the unit is lowered, this guard will retract to allow the cut. This guard will be locked in the closed position, with a release control on the operator's handle. Safe use of manually operated cross-cut sawing machines wis36(rev1) (hse.gov.uk)

Narrow Band Saw (Blade less than 50mm wide) Introduction to woodcutting machinery - Narrow band saw (hse.gov.uk)	No adjustable guard	PN Reg 11 PUWER	Between the table and the top pulley enclosure there should be an adjustable guard that fully encloses that section of the blade on all four sides, as shown in the illustrations. This is attached to and moved with the top blade guide. This adjustable guard should be either self-locking or capable of being locked in position. It should also have sufficient adjustment to enable movement down to the table. Narrow band saws: Safe working practices WIS31 (hse.gov.uk) If the guard is present but incorrectly adjusted to its maximum opening, consider whether training and supervision are adequate
Vertical Spindle Moulder Introduction to woodcutting machinery – Vertical Spindle Moulder (hse.gov.uk)	Spindle moulder in use for straight work without adequate false fence and/or fixed guards Hand feeding straight work without a power feed	PN and consider PR Reg 11 PUWER IN Reg 12 PUWER	The cutters, cutter block and spindle behind the fence should be fully enclosed by a suitably designed guard or guards which allow for the connection of dust exhaust outlets. Before machining starts, the gap between the outfeed and infeed fences must be closed by the attachment of a false fence allowing only that part of the cutter which is cutting to be exposed Vertical spindle moulding machines: Safe working practices WIS18 (hse.gov.uk) Getting the operator to describe how they fit a new false fence is a good way of judging their competence A demountable power feed device should be used wherever and whenever possible. ACOP para 130 Safe use of woodworking machinery ACOP L114 A power feed will not be possible for “stopped” or curved work.
Misuse of hand router	Hand router inverted and fixed to bench to create a vertical spindle. No guarding of cutter	PN Reg 11 PUWER	In effect this creates a small spindle moulder. Guarding of this sort of arrangement is difficult. Refer cases to sector for assistance
Planers and Planer/Thicknessers Introduction to woodcutting machinery – Surface planer (hse.gov.uk)	Bridge guard missing or the guard cannot be adjusted to cover the entire length and diameter of the exposed cutter block on both sides of the fence Continuous feed rollers on planing machines used for thicknessing or thicknessing machines when processing more than one piece at a time.	PN Reg 11 PUWER PN Reg 12 PUWER	To prevent access to the cutter block there should be guards in front of and behind the fence. The fixed guard behind the fence is attached either to the fence or to the fence support and is designed to move with the fence as it is adjusted. A bridge guard is used to prevent access at the front of the fence. Both guards must be capable of covering the full length and diameter of the cutter block. Hand-fed surface planing machines: Safe working practices WIS17 (hse.gov.uk) Sectional feed rollers, designed and constructed so as to restrain any workpiece ejected towards the infeed end of the machine, should be used for planing machines used for thicknessing. They should also be used for thicknessing machines when processing more than one piece at a time. ACOP para 134 Safe use of woodworking machinery ACOP L114

Single End Tenoner	Cutters not guarded so far as is practicable	PN Reg 11 PUWER	Newer machines are provided with a high standard of guarding with access to the tools prevented. There are still a large number of older hand-fed, single-end tenoning machines in use and the standard of guarding on many of these machines is often not very high. This is because of the way the machine operates and the type of work done, both of which make conventional guarding difficult. It is however 'practicable' to make modifications and improvements to their guarding which will reduce the risk of injury to operators and others. Single-end tenoning machines: Safe working practices WIS39 (hse.gov.uk) If the guards are present but all positioned in their widest or most open position, consider whether training and supervision are adequate
	Cutters cannot be completely guarded, and machine not fitted with front and rear table guards	PN Reg 11 PUWER	It is also 'practicable' on most machines to fit vertical plates (table or flag guards) to the machining side of the sliding table. These are positioned in front of and behind the workpiece and prevent the operator's hands or arms from coming into contact with the cutters as the workpiece is taken through the machine.
	Workpiece cannot be effectively clamped	PN Reg 12 PUWER	All machines should be provided with workpiece clamping as it is important that the workpiece is held securely whilst being machined to prevent it from being ejected. On most machines, this is achieved by vertical or horizontal (side) clamps. Newer machines may have powered clamping but on older machines there are often hand-operated clamps Single-end tenoning machines: Safe working practices WIS39 (hse.gov.uk)
	Access to the sides and rear of the tenoner during operation	IN Reg 11 PUWER	On machines where access to dangerous parts of the machine cannot be completely prevented through guarding, access to the sides and rear of the machine should be prevented by a combination of positioning within the workshop and additional fencing
Four-sided Moulding Machines	Access to cutters during normal operation	PN Reg 11 PUWER	When the machine is in normal operation there should be no access to any of the cutters Four-sided moulding machines: Safe working practices WIS40 (hse.gov.uk)
	No safe system of work for setting up the machine	PN s2 HSWA & Reg 22 PUWER	During setting, it is a requirement for the heads to be running as the trial piece of material is 'inched through' the machine and the pressures/chip breakers are correctly adjusted. Older machines may not have the remote setting/ adjusting mode of newer machines or external tool adjustment and in some cases cutter adjustment must take place locally. Setting must be carried out by a competent person following a safe system of work. See section on Adjustment, Setting and Jointing in Four-sided moulding machines: Safe working practices WIS40 (hse.gov.uk)

Wood Turning Lathes	No tool rest on powered hand turning lathe	PN s2 HSWA & Reg 11 PUWER	The tool rest should be set close enough to ensure the user can hold the chisel steady with the minimum of effort but it should be far enough away from the workpiece to ensure the parallel portion of the chisel is in contact with the rest at all times during cutting operations. The tool rest height should be such that the chisel cutting edge is set at the workpiece centre line. Wood turning lathes: Safe working practices WIS28 (hse.gov.uk)
Rear-handled Chainsaws	Users have not received adequate training in chainsaw use	PN Reg 9 PUWER	Everyone who uses a chainsaw at work, for whatever task, must have received adequate training that should cover: (a) dangers arising from the chainsaw itself; (b) dangers arising from the task for which the chainsaw is to be used; (c) the precautions to control these dangers, including relevant legal requirements ACOP para 133 and 134 Safe use of work equipment. ACOP L22 (hse.gov.uk) If they are engaged in chain saw work on or in a tree then the operator must have obtained a relevant certificate of competence or national qualification unless they are undergoing training to that end.
	Safety features missing or damaged	PN S2 HSWA & Reg 5 PUWER	Saws should have functioning on/off switch, chain brake, chain catcher, front and rear hand guards and a properly maintained chain and guide bar. Chainsaws at work INDG317 (hse.gov.uk) The owner/operator should be able to explain and/or demonstrate each of these features without having to start the saw. If they cannot then consider their competence.
	Operating the saw without adequate PPE	PN	The right combination of PPE for chainsaw use will depend upon the environment in which the saw is being used and the experience level of the operator. There is a useful list in Chainsaw personal protective equipment (PPE) (hse.gov.uk) setting out the expected PPE. Where the duty holder moves away from these recommendations they should be able to demonstrate a suitable and sufficient risk assessment has been done to justify their decision.

Training	Untrained operators using any powered woodworking machines either hand or power fed. Note: that untrained operators may be able to use equipment under close supervision as part of their training programme. Lack of suitable training for machine operators.	PN Reg 9(1) PUWER IN Reg 9(1) PUWER	Machine operators should be trained to use them and also those who help in the machining process, e.g. in taking off, feeding and/or loading workpieces etc. Training should also be provided for those who set, clean, or maintain woodworking machinery. Training can be delivered in-house, or can be sourced externally – Regulation 9(1) PUWER (also see L114). Guidance on suggested content for training courses is given in Appendix 1 of L114. Examples of training records are given in Appendix 2 of L114. A suggested specification for in-house training is set out at Appendix 3 of L114. More information on training, supervision, training providers and woodworking training courses can be found at Managing woodworking safely – Training providers (hse.gov.uk).
Training (young people)	Untrained young persons using high risk wood working machines (i.e. those that are hand-fed and/or where access to dangerous parts is possible).	PN and consider PR Reg 9(1) PUWER	Young persons (under 18's) can use high risk wood working machines provided they have the necessary competence and maturity which includes having completed appropriate training. Note: if children found using equipment contact the sector for advice and refer to Q&A document.
Supervision	Untrained supervisor or no supervisor in charge of machining operations or lack of adequate supervision.	IN Reg 9(2) PUWER	Employers must ensure that supervisors receive adequate health and safety training. This should include training in how to use the work equipment under their control, the risks involved and the precautions to take. Although it is difficult to define precisely what represents an adequate level of supervision as it will vary depending on the level of skill of the operators – see Q&A document. More information can be found at: Supervising for safety in woodworking (hse.gov.uk)

Appendix 5.2 Industry specific information and Initial Enforcement Expectation (IEE) tables for noise in woodworking

Introduction
HSE's knowledge of the extent of noise risk across the woodworking sector is limited. WIS 13 contains noise levels that would be expected from woodworking machinery with no noise control features. We expect a significant number of such machines to still be in use in the industry. Operators of such machinery will be heavily reliant on hearing protection to reduce the risk to their hearing from exposure to noise. We are asking you to identify where noise is a matter of evident concern (MEC), to collect relevant noise documentation (in particular noise assessment made either by the dutyholder or by a third party), to ensure that those who require it are under suitable health surveillance and to ensure that an effective hearing protection programme is in place. We are also asking you to look for specific noise control measures on specific machine types and to take action on noise control where no effort has been made to control noise at source. This work will reduce risk from noise in high noise risk workplaces where this has not adequately addressed. The collection of noise documentation will allow an analysis to be made of what parts of the woodworking industry pose the highest noise risks. This will allow future HSE interventions on noise in woodworking to be targeted at the highest risk premises.
Health and safety
Inspector's weekly average noise exposures are likely to be well below the 80 dB $L_{EP,w}$ lower exposure action value (LEAV). Inspectors must follow best practice and, when visiting woodworking sites should ensure that they carry suitable hearing protection with them and fit it properly at all times while in Hearing Protection Zones (HPZs) and in other noisy areas the inspector considers appropriate. Do not hold conversations with dutyholders in noisy areas with yours or the dutyholder's hearing protectors poorly fitted or removed.
Inspection
Exposure to noise is a MEC when <i>weekly</i> noise exposures exceed the upper exposure action value (UEAV). This is likely when <i>daily</i> noise exposures exceed the UEAV on 3 or more days of the week. You will need to assess whether or not noise is a MEC at each site you visit. The following two circumstances indicate that noise is a MEC and therefore you do not need to make a separate assessment: 1. The dutyholder's noise risk assessment already identifies that noise exposures are above the UEAV on 3 or more days of the week. 2. The dutyholder has setup signed hearing protection zones or the dutyholder has instructed workers to wear hearing protection and the work that requires this occurs on 3 or more days of the week, Where a noise risk assessment is absent or does not identify noise exposures, you can use a listening test to help you make an assessment of whether noise is a MEC. Do you need to raise your voice to have a conversation when stood 2 metres apart? Are workers in that noise environment for most of the working day? (YES/NO) Or; Do you have to raise your voice to have a conversation when only 1 metre apart? Are workers in that noise environment for more than 2.5 hours per day? (YES/NO) And; Does this occur on 3 or more days of the week? (YES/NO) If the answer to this is yes then weekly noise exposures are likely to be above the 85 dB $L_{EP,w}$ UEAV and therefore noise is a MEC. Some workplaces may have different areas of the workplace where noise exposures vary significantly. If weekly noise exposures in any part of the workplace are likely to exceed the UEAV then noise is a MEC.

Where noise is a MEC then please collect electronic copies of the dutyholder's noise documentation (including noise assessments and related risk assessments). Please include the COIN inspection case reference in your email. You will need to make an assessment of the risk assessment's suitability and sufficiency and enforce accordingly.

Where you find that noise is a MEC then go on to look at:

Noise Control

You will need to assess whether specific noise control features for specific machine types are present. A visual guide for this is available at [Appendix 5.6](#). For workplaces that use enclosed woodworking machinery, you will need to assess whether the main noise control features of those enclosures are being maintained in good working order. A visual guide for this is available at Appendix 5.6. IEEs for noise control in woodworking are listed below.

It is expected that old woodworking machinery without any noise reduction measures will still be common across the industry. Research is underway to identify what noise levels modern well designed equivalent machinery can produce. A small number of established noise controls can be retrofitted to older machinery. Some machinery may be able to be enclosed to contain the noise it produces.

Retrofittable noise controls that should be in place are:

Bench Saws, Cross-cut Saws and Cut-off Saws:

- Low-noise circular saw blades

Planers and Thicknessers:

- Segmented, helical/spiral cutters OR slotted table edges before and after cutter block

4-sided Moulders:

- Segmented, helical/spiral cutters

Effective maintenance of noise controls is critical to sustaining their performance. It is also an absolute duty under the noise regulations. For all enclosed machines it is expected that:

- Flexible fingers covering workpiece entry and exit points are complete and undamaged.
- Foam-type noise absorption, where fitted inside enclosures, is in good condition.

WIS13 provides additional guidance regarding the factors affecting the noise levels produced when using woodworking machinery. The dutyholder should be made aware of this guidance if they are not already aware of it.

Health surveillance

The individuals who are exposed to noise above the weekly UEAV should be under suitable health surveillance to look for early signs of noise induced hearing loss (NIHL) and to prevent worsening of NIHL.

Health surveillance involves taking a relevant medical history, ear canal examination and a hearing check prior to working in the noisy environment, or as soon as possible after the initial exposure. This is followed by a regular series of tests, usually annually for the first two years and at three yearly intervals thereafter, provided there is no abnormality and there are no other risks of hearing damage. Employees are informed about the state of their hearing and employers are informed of the significant findings in terms of workers fitness for work and of any adjustments that may be required.

The dutyholder should be able to demonstrate that those individuals are undergoing NIHL health surveillance at least every three years. If it is found that NIHL health surveillance for those who require it is absent then an improvement notice is the initial enforcement expectation (IEE), see below.

Hearing Protection

Where noise exposures exceed the UEAV then the employer must provide suitable hearing protection and employees must wear it. It is essential that hearing protection is worn correctly and that it is worn for the whole duration of noise exposure. Removing hearing protection for even short durations in noise will significantly reduce the effectiveness of that hearing protection.

If hearing protection zones (HPZs) have been established, then everybody who enters those zones must wear suitable hearing protection for the entire time they are in those zones. Those individuals transiting through the HPZs should also wear hearing protection while in the HPZs. Commonly used walkways should be routed away from HPZs wherever possible.

Hearing protection must be worn correctly otherwise the protection it provides can be severely compromised. Appendix 5.5 shows some examples of hearing protection being worn poorly enough that it will be providing minimal protection from noise exposure. If this is found then this could be indicative of poor supervision, poor selection of hearing protection or poor training. Reusable hearing protection (usually ear muffs) must be kept in good condition or the protection it provides can also be severely compromised.

Guidance

Woodworking Q&A document

Woodworking Noise PowerPoint presentation

[Guidance on the Control of Noise at Work Regulations 2005 \(L108\)](#)

[Noise Topic Inspection Pack \(due to be replaced by an OG\)](#)

Contacts

Noise and Vibration Team:

Aberdeen, Carlisle, Edinburgh, Glasgow, Inverness, Newcastle: Chris Steel

Bootle, Crewe, Leeds, Nottingham, Sheffield, Wrexham, York: Andrew Hounslea

Basingstoke, Birmingham, Bristol, Cardiff, Carmarthen, Plymouth: Paul Delderfield

Ashford, Bedford, Chelmsford, London, Norwich, Oxted: Tao Wu

Noise IEEs			
Task	Situation	IEE	Comment
Noise control	Exposure is likely to be at or exceed the UEAV of 85 dB(A) AND No noise control implemented or planned	IN	When none of the applicable expected noise controls are either in place or planned to be put in place. These are: 1. Low noise circular saw blades on table saws, cross-cut saws and chop saws. 2. 4-sided Moulders are fitted with segmented helical/spiral cutter blocks. 3. Planers and thicknessers are fitted with segmented helical/spiral cutter blocks OR the table edges in front of and behind the cutter block are slotted. HSWA S2 Control of Noise at Work Regulations (CNWR) Reg 6(2) Require that Noise exposure should be reduced to as low a level as reasonably practicable by establishing and implementing a programme of organisational and technical measures, excluding the provision of personal hearing protectors, which is appropriate to the activity. Regulation 6(3) includes general measures to be considered in complying with the notice. Details of the specific expected controls should be included in the letter accompanying the IN. The general guidance regarding the factors affecting noise levels when using woodworking machinery in table 2 of WIS13 should also be referred to in the letter.
Noise control	Exposure is likely to be at or exceed the UEAV of 85 dB(A) AND Some reasonably practicable noise controls not implemented or planned	NOC Letter	When some of the expected noise controls listed above could be applied but are not. For example, a planer is in use with a straight cutter block and no slotted table edge, however all in use circular saw blades are low noise designs. HSWA S2 CNWR Reg 6(2) Acknowledge presence of some controls. List remaining applicable expected controls. The general guidance regarding the factors affecting noise levels when using woodworking machinery in table 2 of WIS13 should also be referred to.
Maintenance of Woodworking Machinery Noise Control Features	Exposure is likely to be at or exceed the UEAV of 85 dB(A) AND	IN	When 'flexible fingers' on the workpiece entry and exit ports on enclosed machinery are missing or damaged and/or if foam-type noise absorption has been fitted inside a location and is damaged or missing. HSWA S2 CNWR Reg 8(1)(b)

	Flexible fingers and/or foam noise absorption (where fitted) is not maintained		
Hearing Protection Provision	Exposure is likely to be at or exceed the UEAV of 85 dB(A) AND No hearing protection provided.	IN	Require provision of suitable hearing protection HSWA S2 CNWR R7(2) Consider prosecution
Full and proper use of hearing protection	Exposure is likely to be at or exceed the UEAV of 85 dB(A) and Personal hearing protection is not being fully or properly used where it has been supplied under R7(2)	IN	Require full and proper use of personal hearing protection HSWA S2 CNWR R8(1)(a) Consider prosecution Note: also consider underlying issues, such as information, instruction and training; adequate supervision; or suitability of the hearing protection provided.
Use of hearing protection in HPZs	Exposure is likely to be at or exceed the UEAV of 85 dB(A) and Personal hearing protection is not worn within designated hearing protection zones (HPZ) and/or access to zones is not restricted where practicable.	IN	Require a system to be implemented to ensure that access to HPZ is restricted and no employee enters zone unless wearing personal hearing protectors HSWA S2 CNWR R7(3)
Maintenance of hearing protection	Personal hearing protection provided by the employer is not adequately maintained.	IN	Require a maintenance system of hearing protection provided to be implemented HSWA S2 CNWR R 8(1)(b) Consider prosecution when exposures are likely to exceed the UEAV of 85 dB(A) and where failure to maintain hearing protection will or has led to significant hearing damage.

Provision of health surveillance for NIHL	Exposure is likely to be at or exceed the UEAV of 85 dB(A) and There is no health surveillance, or health surveillance systems inadequate	IN	Require a suitable system of health surveillance CNWR R9(1) Consider prosecution where exposure usually exceeds the UEAV of 85 dB(A) and subsequent audiometry shows damage that could have been avoided with earlier health surveillance
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Guidance for other IEEs can be found in the general noise guidance. Please contact a noise and vibration specialist inspector with any queries.

Appendix 5.3 Examples of industry specific Matters of Potential Major Concern (MPMC)

Inspectors must consider action in relation to Matters of Evident Concern (MEC) or Matters of Potential Major Concern (MPMC) at all visits (see [OC18/12](#)).

Recent events, including multiple fatalities from a wood dust explosion and a number of fatalities involving explosions and fires involving solvents, have reinforced the importance of taking action on the management systems to prevent catastrophic events. [OC18/12](#) explains the actions required and gives examples of the issues to consider that could lead to catastrophic events.

Further information on fire and explosion risks can be found in the Woodwork Q&A document, and in the [Woodworking Information Sheet WIS32](#).

Included in the industry-specific appendix ([5.1 above](#)) are specific examples of situations that could lead to potentially catastrophic events. There are other events common across the industries that are not included here. See above and [OC18/12](#) for more details.

Inspectors should discuss with their local Process Safety Champion if further assistance is required.

Appendix 5.4 : general references

General COSHH references:

[Local exhaust ventilation - Frequently asked questions](#)

[Clearing the air. INDG408\(rev1\) - Clear the air: A simple guide to buying and using local exhaust ventilation \(LEV\)](#)

[Construction Dust CIS36](#)

[COSHH gateway](#)

[COSHH ACOP L5 \(sixth edition\)](#)

[COSHH essentials](#)

[Controlling airborne contaminants at work: A guide to local exhaust ventilation \(LEV\) \(HSG 258\)](#)

[General methods for sampling and gravimetric analysis of respirable, thoracic and inhalable aerosols MDHS14 \(hse.gov.uk\)](#)

[RPE Fit Test Providers Accreditation Scheme](#)

[Respiratory protective equipment at work: A practical guide \(HSG 53\)](#)

[Respiratory Protective Equipment](#) (including enforcement guidance)

[Woodworking health topics – Inhaling wood dust](#)

General asthmagen references:

[Asthma pages of HSE web site](#)

[Asthmagen? Critical assessments of the evidence for agents implicated in occupation asthma – ‘Asthmagen compendium’](#)

[Cleaning methods - HSE video comparing exposures Wood dust exposure video - Clean your act up](#)

[The dust lamp: A simple tool for observing the presence of airborne particles MDHS82 \(hse.gov.uk\)](#)

[Health Surveillance for Occupational Asthma \(G402\)](#)

General carcinogen references:

[Occupational cancer pages of HSE website](#)

General noise references:

[Removal of hearing protectors severely reduces protection - Noise - HSE](#)

Other general references:

[The British Furniture Manufacturers Association BFM](#)

British Occupational Hygiene Society (BOHS) [Directory of OH Services \(bohs.org\)](#)

Buyer's Guide for Occupational Services [BOHS-Buyers-Guide-Version-2-September-2021.pdf](#)

[The BWF - British Woodworking Federation | The Voice of Woodworking](#)

[What is Competence? - Competence in health and safety](#)

[EMADA | Extraction Manufacturers Designers Association](#)

[Safe collection of wood waste: Prevention of fire and explosion wis32\(rev1\) \(hse.gov.uk\)](#)

[Institute of Local Exhaust Ventilation Engineers - ILEVE](#)

[Frequently Asked Questions - MDF \(hse.gov.uk\)](#)

[SEQOHS accreditation scheme](#)

[HSE - Skin at work: Work-related skin diseases - Prevention](#)

[SOM \(Society of Occupational Medicine\)](#)

[Supervising for safety in woodworking INDG440](#)

[Timber Development UK - Timber Trade Federation \(tff.co.uk\)](#)

[EH/40 Workplace exposure limits \(WELs\) for use with the Control of Substances Hazardous to Health Regulations 2002 \(as amended\)](#)

Appendix 5.5 : Visual guide to poorly worn hearing protection

Poor Fitting of Earmuffs – Other Headgear



Earmuffs worn incorrectly
to fit around cap



Solution - Earmuffs with
rotating headband allow
proper fitting

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Poor Fitting of Earplugs

- 'More out than in'



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Poor Fitting of Earplugs

- 'Storage position'
- No attenuation at all.



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Earmuff Damage



Reduced
Headband Tension
(pair on the left)



Torn /Burst /
Hardened Seals

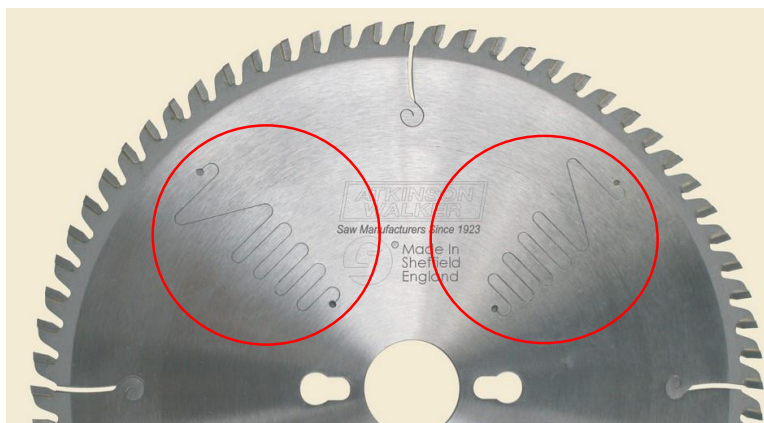


Damaged
Headband

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Appendix 5.6 : Visual guide to expected noise controls

Low-Noise Circular Saw Blade



- If similar etched lines are present it is likely to be a low-noise blade.

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Planer/Thicknesser/Moulder Cutter Block Types



- Segmented helical/spiral cutter
 - Progressive 'slice' across workpiece.
- vs.
- Straight blade
 - Cuts full width at the same time.



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Planar/Thicknesser



- Slotted table edges
 - Reduces turbulence as each blade passes table edge.
 - Segmented cutter has similar effect.
 - One or the other should be Fitted.



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Maintenance of Noise Control



- Enclosed machines fitted with 'flexible fingers' at entry and exit points.
- Should be complete to minimise opening when wood passes through
- Minimum opening = minimum noise escape



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