

Encouraging purchasers of work equipment to Buy Quiet

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HSL: HSE's Health and Safety Laboratory



Why the need for encouragement?

- Motivation?
- Genuine choice?
- Reliable data to inform choice?
- Benefits?
- Examples?



Why is HSE interested in Buy Quiet?

- High noise at work is causing disability
- Workers reliant on hearing protection
- Easier to apply proven noise control technology during design/build
 - Enforcement of retrospective noise control can be complicated
 - Is enforcement against manufacturers more efficient?









- Interest from wide range of stakeholders
 - Manufacturers
 - Employers
 - Unions
 - Insurers
 - Labour inspectorate

- Common agreement
 - Noise could and should be lower

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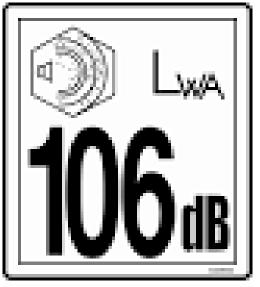
- NOMAD showed 80% of noise data is unreliable
 - Will noise data become clear?
 - Are there competing noisy and quiet machines?
 - Does low noise equipment need promotion?
 - Is the noise reduction benefit disproportionate to Buy Quiet effort?

N@MAD Noise Machinery Directive

HSE observations on noise data

- **H**SE
- Inconsistent noise emission values L_{pA} , L_{WA}
- Confusion over sound power and sound pressure
- Duty holders seek examples of good practice
 Wood chipper model noise declaration
- Noise test codes
 - Representation of noise hazard?
 - Reliability?
 - Repeatability?
 - Reproducibility?

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Machinery Directive (noise)



- Machine can be used without (noise) risk
 - Hazards to be eliminated/ protected/ reported
- Report
 - Instructions for use without risk from noise
 - Emission data in instructions and sales literature
 - Noise hazard known before purchase
- Noise data used to verify noise minimisation

Sanders



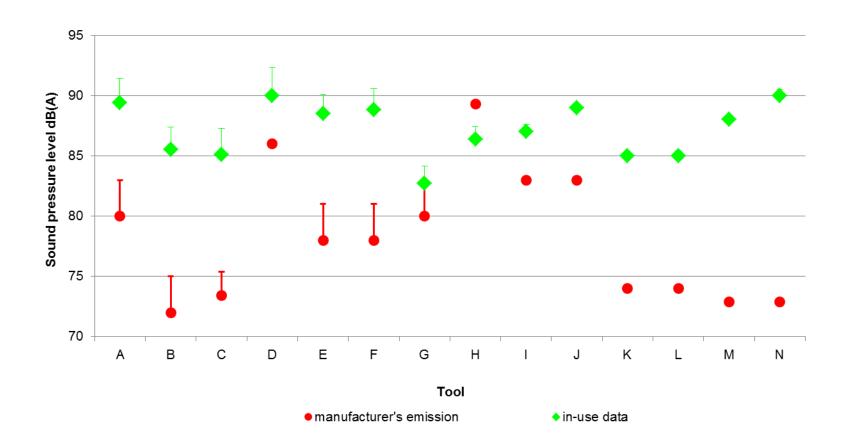




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Sanders – relative hazard?







- Manufacturers claim 17 dB difference
 - HSL found less than 7 dB in normal use
- Why no action by purchasers?
 - Manufacturers data known to be unreliable?
 - Difference in hazard much greater than risk?
 - Duration of use too short?
 - Apathy? Ignorance? Confusion? ...



Wood chippers



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- L_{pA} measurements simple at operator's position - L_{pA} values indicate high noise hazard
- Up to 7 dB difference between competing machines
 Choice for purchasers
- Noise test codes for L_{WA}
 - Unclear too many decisions by tester (OND)
 - Scope for L_{WA} emission values to vary by 6 dB

declaration

Stakeholders seek model

• See Brereton InterNoise16

A model noise declaration

- $-L_{pA}$ according to standards
- $-L_{WA}$ according to OND
- L_{pCpeak} above threshold
- Challenging task!

The tables below give the hole emission values required by machinery breedive 2000 42		
Emission sound pressure levels at the operator position (infeed hopper)		
The emission sound pressure level is a measure of how loud a machine is at a specified position for a		
specified operation when working on open ground. The sound pressure level will be higher than the		
emission sound pressure level if noise cannot escape into the open air, for example, because of		
vegetation, buildings, walls or ceilings. The emission sound pressure level can be		
preliminary guide to noise hazard and to compare the noise hazard of woodchippers measured		
same way doing the same task, that is, measured to the same standard.	surea in me	
You must manage the noise hazard of this wood chipper to avoid putting operators' hearing at risk.		
DECLARED DUAL-NUMBER NOISE EMISSION VALUES		
in accordance with ISO 4871		
Measured A-weighted emission sound pressure level, L_{pA} (ref. 20 µPa) at the	113	
operator's position at the infeed hopper, in decibels		
Uncertainty K _{pA} , in decibels	4	
Measured C-weighted peak emission sound pressure level, L _{pCpeak} (ref. 20 µPa) at	141	
the operator's position, in decibels	141	
The numerical values reported here are measured according to the noise test code gi	ven in BS	
EN 13525:2005 + A2:2009, using the basic standard BS EN ISO 11201:2010. Du		
emission tests the woodchipper was chipping pine laths.		
NOTES:		
The standard operating condition (chipping 4m x 50mm x 50mm pine laths) provide	amission	
The standard operating condition (chipping 4m x 50mm x 50mm pine ratis) provide L_{pA} values that are particularly noisy. A common operating condition is when chip		
	pping pine	
logs; under these conditions:		
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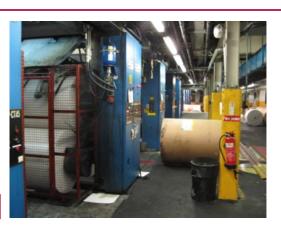
The tables below give the noise emission values required by Machinery Directive 2006/42/EC.

Figure 2 – Sample noise declaration for woodchippers

Printing machinery

- *L*_{pA} values provided
- Reliable indicator of real use risk
 - Large machines L_{WA} not required
 - Operating conditions represent noise at workstations
 - Declared noise describes effectiveness of Enclosures, Havens, ...









- Yes, Buy Quiet works from first principles
 - Recognise hazard
 - Specify for noise
 - Evaluate against specification
 - Give preference to lower noise machinery
- Must be genuine differences between machines
 - Works for high value, high risk, eg printing
- Can we make it work for moderate purchases?

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- Examples of the benefit of Buy Quiet
 - Where are they?
- SIMPLIFICATION
 - Focus on hazard L_{pA}
 - L_{pA} gives comparison based on hazard
 - Tabulation of 'emission' corrections
- Can use be made of manufacturers' noise data?



- Willing participation by all manufacturers
- Knowledgeable participation by purchasers
- Reliable noise test codes
- SIMPLIFICATION
- Enforcement



- Tabulation of what we know
 - Guide values to noise by industry
 - Identification of high and low noise processes
 - Naming of high and low noise machines
 - Participation by willing manufacturers
- SIMPLIFICATION



Will a change in presentation help?

- Promote low noise with colour
- Noise rainbow?
- Describe noise hazard
 - SPL or emission SPL?
 - Data verified accurate?

Noise level	Rainbow colour
More than 95	Red
90-95	Orange
85-90	
80-85	Green
75-80	Blue
70-75	Violet
Less than 70	Black





- Choose targets carefully
 - Differences in hazard must also apply to risk
 - Moderate selling, moderate size machines
 - With obvious higher and lower noise models
 - Easier management of quieter option
 - -Hearing protection unnecessary
- SIMPLIFICATION

Any questions?





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