
QBE HAVS INTERACTIVE RISK MANAGEMENT WORKSHOP



Vibration Risk Assessments Bob Mitchell



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HOW DO WE MANAGE IT ALL?

What is a suitable and sufficient assessment?

One which:

- Identifies where there may be a risk;
- Makes an estimate of exposures to compare with the action and limit values based on sound information;
- Identifies the actions required to control and monitor the risks;
- Identifies suitable risk control measures that either remove or reduce exposure; and
- Records the assessment, the steps taken and their effectiveness.



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TYPICAL TOOL VIBRATION MAGNITUDES (m/s²)

Type	Lowest	Typical	Highest
Road breakers	6	8 - 12	20+
Hammer and impact drills	6	10	20+
Rotary drills	2	3 - 4	8
Angle grinders	3	5 - 6	12
Linishers	-	3 - 5	-
Die grinding	2	4 - 6	18
Needle scalers	6	8 - 10	18
Chipping hammers	5	6 - 10	16
Chainsaws	3	4 - 8	26
Brushcutters	2	3 - 5	16



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ESTIMATING THE TOOL VIBRATION MAGNITUDE

Sources of information

- Manufacturers' emission data
- Other data provided by manufacturers
- Databases
 - European
 - Manufacturers
 - HSE
- Measurement



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HSE EFFECT OF MULTIPLICATION FACTORS

Manufacturers' emission data

Percentage of mean in use
total values exceeded

x 1.5	48%
x 2.0	61%
x 2.5	72%
x 3.0	80%

Single axis values need to be multiplied by an additional 1.4



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WORDS OF WARNING (3)

Measurement accuracy

Possible variables

- Operator
- Type of work
- Suitability of bench tests
- Feed and grip forces
- Instrument problems
- Mechanical filters
- 6 x 10-second samples
- 4 x 15-second samples



EXPOSURE TIMES

Difficult to estimate

Table 35
Relation between observed and reported exposure times for common hand-powered vibratory tools

Source	Number of people in whom tool was observed	Median number of times tool was used	Reported: observed ratio of exposure times	
			Median	(IQR)
Impact screwdriver	7	10.0	4.00	(3.68 - 17.50)
Nut runner	8	10.0	2.96	(1.67 - 8.59)
Nailing or stapling gun	11	8.0	4.57	(2.29 - 6.91)
Hammer drill	6	8.0	2.66	(2.00 - 9.66)
Hand-held sander	8	7.5	6.31	(3.42 - 7.57)
Impact wrench	5	4.0	5.56	(3.00 - 10.00)
Jig saw	8	3.5	3.53	(1.83 - 8.22)
Hand-held portable grinder	11	2.5	2.08	(1.20 - 6.25)
Hand-guided mower	10	2.0	1.17	(0.75 - 2.00)
Floor polisher	13	1.0	1.63	(1.37 - 1.87)
<i>All tools</i>	<i>104</i>		<i>2.48</i>	<i>(1.64 - 5.89)</i>

**No. with non-missing information*
IQR - interquartile range

EXPOSURE TIMES - PRACTICAL SOLUTIONS

Observe a sample of typical work using:

- Stopwatch
- Video analysis
- Noise meters
- Electrical timers
- C/air timers
- Sample of repetitive jobs
- Increased observation time = improved accuracy



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REMEMBER THE OBJECTIVE OF ASSESSMENT

- Accuracy $\pm 20\%$ at best
- Is it above the EAV?
- Is it above the ELV?
- The band of uncertainty

	-20%	0	+20%
EAV	2.0	2.5	3.0
ELV	4.0	5.0	6.0



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THE PLAN OF ATTACK

- Have you:
- Evaluated practical solutions, practicability and cost
 - Established targets which can be realistically achievable
 - Allocated priorities (groups at high risk)
 - Established an Action Plan
 - Defined management responsibilities
 - Allocated adequate resources
 - Evidence that the programme has been: Implemented
Monitored
Evaluated



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REDUCING EXPOSURE

- Eliminate exposure - mechanisation, time and investment
- Modify the process - change the tools? Production/time/magnitude
- Replace old tools - lower emission values
- Train employees in correct use
- Minimise forces - let the tool do the work
- Maintenance - checks before/after - bench tests
- Reduce exposure - job rotation
- Below the Action Level - reduce to lowest level reasonably practicable



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MANAGING EXPOSURE

- Points system - For each tool - points/minute or hour

Add up and record points per day?

EAV 100 ELV 400 points/day

- Workers already suffering symptoms

No exposure?

Set lower points/day

Maintain records filled in by employee

- Traffic light systems:

Mark tools

Green

=

Green Amber Red

x mins use

Amber

=

y mins use

Green and Amber

=

y mins use

Red

=

Permit to Work?



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HOW DO WE DEAL WITH EXISTING AND FUTURE CLAIMS?

- Problems observed:
 - Few companies have carried out a suitable assessment
 - Few companies have a Plan or implemented controls
 - Very few companies have records
- Establish what was their exposure
- Was there a foreseeable risk?
- Could/should it have been reduced?
- What other measures should have been introduced?
- Apportionment - years or dose?



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