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Table 1. Established noise control methods for high-risk activities

Product	Process	Example noise levels, dB*	Established noise control methods	Further information (links)
Flat products (e.g. slabs, fence posts, panels). Reinforced concrete products (e.g. beams, steps)	Mould filling, demoulding and stacking using vibrating tables or conveyors	Steel tables: 95 - 110 Tables/conveyors with rubber covering: 86 – 93	Use self-compacting concrete (see below) Use resilient material (e.g. rubber) on tables Clamp mould to table Fit tunnels or enclosures over conveyors Enclose undersides of conveyors and tables Maintenance of enclosures, skirts, etc. Maintenance of vibrator motors and mountings Use wood, fibreglass or rubber moulds instead of metal to reduce impact noise	Noise control in the concrete products industry: General information *(see HSE noise web pages)* SIM 03/2002/51 Noise in the manufacture of Concrete Products - http://www.hse.gov.uk/foi/internalops/sectors/manuf/3_02_51.pdf HSE Specialist Inspector Report No. 33. The Control of Noise in the Concrete Industry
	Use of self-compacting concrete (SCC)	Relatively quiet process: no vibration required	SCC (concrete to which chemical plasticisers are added) is increasing in popularity in the UK. Its use has the potential to eliminate the main source of noise (vibration). SCC should be discussed at visits to raise the profile and encourage innovation.	European guidelines for self-compacting concrete - http://www.britishprecast.org/publications/documents/scc_guidelines_may_2005_final.pdf (See chapter 12 for information on pre-cast products)

* Sample L_{Aeq}. The noise levels are indicative only and will vary depending on equipment type and conditions of use.

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Product	Process	Example noise levels, dB*	Established noise control methods	Further information (links)
Blocks, tiles, slabs	Vibratory presses	No noise reducing features: 96 - 110 Outside press enclosure: 84 - 93 Unloading stations: 86 - 88 Inside control rooms: 71 – 79	Fit enclosure (all controls outside) or provide separate control room (noise refuge) Isolate vibrating parts from floor and enclosure Maintenance of vibrator motors and mountings Silencers for compressed air exhaust Secure all parts and fittings to prevent rattling Use resilient material (e.g. rubber) for stops	Example: use of plastic components in a block-making machine - http://www.hse.gov.uk/noise/soundsolutions/ss6.htm
	Rumblers/ Tumblers,	84 – 95	Line barrel of tumbler with rubber lining Isolate plant from other processes and/or use plastic curtains to separate from employees	
	Saws	81 – 96	Use noise-reduced saw blades	Example: reduced stone cutting noise (HSG138 #52) *(see HSE noise web pages)*
Extruded tiles	Extrusion plant Pallet /mould conveyors	86 – 93	Extrusion plant: • use noise-reduced blow-off jets/air knives • use silencers on compressed air exhausts Conveyors: • control speed to minimise collisions between pallets (may require training) • use an impact absorbing material (e.g. polyurethane) on convenor guide rails etc.	

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Product	Process	Example noise levels, dB*	Established noise control methods	Further information (links)
General	Chutes and skips		Provide chutes and skips with rubber lining Minimise dropping distances for waste material	Avoiding impacts *(see HSE noise web pages)* - (from paragraphs 207 – 208 of L108 "Controlling noise at work", ISBN 0-7176-6164-4, available from HSE Books at www.hsebooks.co.uk) Example: Reducing noise in gravel chutes (HSG138 #1) *(see HSE noise web pages)*
	Mixing machines		Noise havens containing all control consoles	
	Cleaning equipment	Chipping hammers: can be > 120 dB Ultra high pressure water jetting: up to 105	Avoid or minimise the need for use of noisy equipment by washing down before the 'mix' goes off. For water jetting, locate compressor in acoustic housing, restrict operating pressure	
	Materials handling		Where heavy quarry type vehicles are employed, use acoustic cabs.	Example: Reducing noise in trucks/cabs HSG138 #24 and #26 *(see HSE noise web pages)*

Table 2: Management of noise risks

(see L108 "Controlling noise at work", ISBN 0-7176-6164-4, available from HSE Books at www.hsebooks.co.uk)

Issue	Expectation	References and related guidance
Workplace design for reduced noise exposure	Table 1 deals with established technical and organisational noise control measures for a range of high noise risk activities or processes. In addition to these measures, in general there will always be benefits to be gained in considering and applying general principles of workplace design for reducing noise exposure. For example: • appropriate use of acoustic absorption within buildings can reduce or limit the effects of reflected sound (specialist help will be needed to put this in to effect); • careful planning could segregate noisy machines from other areas where quiet operations are carried out; • the number of employees working in noisy areas should be kept to a minimum; • screens, barriers or walls can be placed between the source of the noise and the people to stop or reduce the direct sound; • noise refuges can be a practical solution in situations where noise control is very difficult, or where only occasional attendance in noisy areas is necessary; • increasing the distance between a person and the noise source can reduce noise exposure considerably.	Workplace design (L108 paragraphs 198-200, 212-219, 234) *(see HSE noise web pages)* Example: Coating pans *(see HSE noise web pages)* Example: Flexible acoustic screening material (HSG138 #4) *(see HSE noise web pages)* Example: Acoustic refuges (HSG138 #11) *(see HSE noise web pages)* Example: Use of absorption in a noise control programme - http://www.hse.gov.uk/noise/soundsolutions/ss10.htm
Selection of tools and machinery	Employers should demonstrate a positive purchasing policy which makes sure noise is taken into account when selecting machinery. For many types of equipment there will be models designed to be less noisy. When selecting equipment to buy or hire, besides ensuring that the tool or equipment is generally suitable for the job, employers should: • ask about likely noise levels for the intended use(s); • check that manufacturers' noise data is representative of likely noise levels for the intended use(s); • use the noise information to compare machines before making the final choice; • look for warnings in the instruction book to see if particular uses of the tool or machines are likely to cause unusually high noise; • be aware that even where manufacturers declare that their tools or machines produce less than 70 dB, levels may sometimes be much greater in your workplace.	Low noise machines (L108 paragraphs 72-74, 201-202) *(see HSE noise web pages)* Noise at work – advice for employers - http://www.hse.gov.uk/pubns/indg362.pdf L108 Part 4: Selecting Quieter Tools and Machinery
Limiting exposure duration	Restriction of the time spent in noisy areas, or doing noisy tasks, can be effective in reducing noise exposures, as can ensuring that noisy devices are only used when they are actually needed. Where some employees do noisy jobs all day or week, and others do quieter ones, job rotation should be considered. This might need you to train employees to carry out other jobs. This system will reduce the noise exposure of some employees while increasing that of others, so care and judgement is needed. Employees will need to be rotated away from noisy jobs for a significant proportion of time to make an appreciable difference to their daily exposure. The noise exposure ready-reckoner and exposure calculators can be used to indicate the reductions in exposure that can be achieved by reducing the duration of exposure to noise.	HSE Noise exposure ready-reckoner *(see HSE noise web pages)* HSE noise exposure calculators - http://www.hse.gov.uk/noise/calculator.htm

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Issue	Expectation	References and related guidance
Health surveillance (audiometry)	Health surveillance for noise-induced hearing damage should be in place for employees whose daily personal noise exposure is frequently above 85 dB, or who are frequently exposed to peak sound pressure levels above 137 dB. Health surveillance should also be provided where exposures are lower, but where the employee may be particularly sensitive to noise. As a minimum, a programme of health surveillance should include: • audiometric testing (baseline assessment on first entering a job involving noise exposure, annual testing for two years, then three yearly testing) • arrangements to receive medical advice on management of affected employees • arrangements to receive anonymised information to demonstrate effectiveness of controls	Health surveillance – http://www.hse.gov.uk/noise/healthsurveillance.htm Noise at work – advice for employers - http://www.hse.gov.uk/pubns/indg362.pdf Protect your hearing or lose it (advice for employees) - http://www.hse.gov.uk/pubns/indg363.pdf L108 Part 6: Health Surveillance for Hearing Damage
Hearing Protection	Providing personal hearing protection should be one of the first considerations on discovering a risk to the health of your employees due to noise. It should not be used as an alternative to controlling noise by technical and organisational means, but for tackling the immediate risk while other control measures are being developed. In the longer term, it should be used where there is a need to provide additional protection beyond what has been achieved through noise control. Hearing protection use should be targeted at particular noisy jobs and activities. Personal hearing protection must be supplied by the employer to any employee whose daily personal noise exposure is likely to exceed 85 dB, or who are likely to be exposed to peak sound pressure levels above 137 dB. The employee must use the protection provided. The employer should ensure that, through the use of hearing protection, the employee's effective noise exposure is reduced to at least below the above levels. Important factors to consider in the selection and use of hearing protection include: • Types of protector, and suitability for the work being carried out; • Noise reduction (attenuation) offered by the protector, including taking account of 'real-world' factors, and also ensuring that not too much protection is provided; • Compatibility with other safety equipment; • Pattern of the noise exposure; • The need to communicate and hear warning sounds; • Environmental factors such as heat, humidity, dust and dirt; • Cost of maintenance or replacement; • Comfort and user preference; • Medical disorders suffered by the wearer. The use of personal hearing protection should be managed through the provision of appropriate information, instruction and training for employees, supervision and the use of appropriately defined and demarcated Hearing Protection Zones.	Hearing protection – general advice - http://www.hse.gov.uk/noise/hearingprotection.htm HSE hearing protection calculator - http://www.hse.gov.uk/noise/hearingcalc.xls Hearing protection – Over-protection *(*L108 paragraphs 287 – 288) Hearing protection – real-world factors (L108 paragraphs 282 – 286) *(see HSE noise web pages)* Hearing protection – advice on issuing (L108 paragraphs 301 – 305) *(see HSE noise web pages)* Noise at work – advice for employers - http://www.hse.gov.uk/pubns/indg362.pdf Protect your hearing or lose it (advice for employees) - http://www.hse.gov.uk/pubns/indg363.pdf L108 Part 5: Hearing Protection – Selection, Use, Care and Maintenance

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Issue	Expectation	References and related guidance
Information, instruction and training	It is important that employees understand the risks they may be exposed to. Where they are at risk from noise their employer should at least tell them: • the likely noise exposure and the risk to hearing this noise creates; • what their employer is doing to control risks and exposures; • where and how people can obtain hearing protection; • how to report defects in hearing protection and noise-control equipment • what their duties are under the Control of Noise at Work Regulations 2005; • what they should do to minimise the risk, such as the proper way to use hearing protection and other noise-control equipment, how to look after it and store it, and where to use it; • the health surveillance systems. This information should be given in a way the employee can be expected to understand (for example special arrangements might need to be made if the employee does not understand English or cannot read). To establish whether information, instruction and training has been carried out effectively, look for evidence that personal hearing protection is being fully and properly used, that noise control equipment is being used, and that procedures for low noise working are being followed.	What do I need to tell my employees? - http://www.hse.gov.uk/noise/tell.htm Employee and safety representatives - http://www.hse.gov.uk/noise/safetyrep.htm Noise at work – advice for employers - http://www.hse.gov.uk/pubns/indg362.pdf Protect your hearing or lose it (advice for employees) - http://www.hse.gov.uk/pubns/indg363.pdf