

6 How should Hearing Protectors be selected?

When selecting hearing protectors you should take into account both the level of noise the wearer is exposed to and the working environment, in order to provide the optimum level of protection.

Whatever hearing protector is chosen, it must be worn all the time the wearer is exposed to workplace noise. Not using a hearing protector even for a few minutes, greatly reduces hearing protection and can result in hearing damage over a period of time.

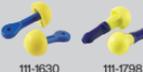
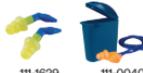


Remember these criteria when you choose your hearing protection:

- Hearing protection must be correctly selected and fitted.
 - Ensure that the protector has the right level of attenuation for your work environment.
 - Comfort – if a product is comfortable it is more likely to be worn for the whole duration of exposure to noise, ensuring the wearer is protected:
 - Protection must be worn during all exposure time
 - Be as light & comfortable as possible
 - Be compatible with other PPE such as industrial safety helmets, respiratory protection and eye protection
- For further details see EN 458:2015.

7 The 3M range of Hearing Protection

Ear Plugs

3M Products	Description	disposable/reusable	Special features available	Attenuation in dB (SNR)
 111-1585 111-1021  111-1797 111-1022	3M™ Roll-down earplugs The standard disposable solution for long exposure periods	disposable	Metal detectable/ Small ear canals/ Corded version/ Colours/Material	from 28dB to 39dB
 111-1630 111-1798	3M™ Pod earplugs The smart solution for hygienic, low cost hearing protection. No roll down required	disposable/ or reusable	Corded version/ Colours	from 28dB to 35dB
 111-1629 111-0040  111-1129 111-1103	3M™ Pre-moulded reusable earplugs The practical reusable solution with resealable pack or storage case	reusable	Corded/ Metal detectable/ Transparent/ Low attenuation	from 20dB to 35dB
 111-1834	3M™ Earplug Dispenser The easiest way to get your 3M Ear Plugs ready for use for the users			

Banded Earplugs/Ear Muffs

3M Products	Description	disposable/reusable	Features	Attenuation in dB (SNR)
 111-0912 111-1031	3M™ EARcaps, Flexicap, 1310 and Pulsar Perfect solution for intermittent wearing periods and limited exposure to noise	reusable	Multiposition/ Pod shapes/ Low attenuation	from 23dB to 28dB
 111-1135 111-1136	3M™ PELTOR™ X3 Earmuffs Available in: Headband and Helmet mounted Newly designed spacer for improved attenuation	reusable	Headband Helmet mounted	from 32dB to 33dB
 111-1137 111-1138	3M™ PELTOR™ X4 Earmuffs Available in: Headband and Helmet mounted Extremely slim and lightweight earcups providing excellent compatibility when used with other 3M PPE	reusable	Headband Helmet mounted	from 32dB to 33dB
 111-1139 111-1141	3M™ PELTOR™ X5 Earmuffs Available in: Headband and Helmet mounted The earmuff for extremely high noise environments	reusable	Headband Helmet mounted	from 36dB to 37dB

Key definitions

Decibel

Unit of measurement, represents size of pressure variation.

Attenuation

Effective protection level.

Octave Band

An octave is a jump of 8 notes and represents a doubling of the frequency. The audio frequency range is regarded as extending from 63 Hz to 8000 Hz octave band. Speech usually lies in the range of 500 Hz to 4000 Hz.

C-weighting

Includes frequencies from 63 Hz to 500 Hz in the overall sound level measurement.

A-weighting

Represents how the human ear interprets sound. It discounts very low and very high frequencies.

Octave Band Method

Uses attenuation data in each frequency range to calculate the total sound level at the ear.

SNR

Simplified Noise Reduction provides an estimate of the overall level of protection a device can offer.

HML

High, Medium and Low Frequency – a simplified method for calculating sound level at ear which is widely accepted amongst safety professionals.

EN 458:2015

The European document that provides guidance on correct selection, use and care of hearing protectors in the workplace.

EU OSHA

The European Agency for Safety and Health at Work.

3M provides a comprehensive hearing protection range from disposable ear plugs to electronic ear muffs so that you can be sure that there is a solution that meets your needs.

For further information please go to www.vwr.com/safety and choose 'Educational Material'

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The Noise Directive

The European Noise Directive
2003/10/EC

EAR PELTOR

VWR
We Enable Science

1 The Noise Directive

What is the Noise Directive?

It is the “**European Union Physical Agents (Noise) Directive, 2003/10/EC**” on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise).

The key elements of the directive include:

Lower Exposure Action Value of 80dB(A) and Upper Exposure Action Value of 85dB(A). In addition, there is a Limit Value of 87dB(A) at the ear that can be achieved by means of suitable hearing protectors.

Why is there a focus on the noise directive?

Noise induced hearing loss (NIHL) has been and continues to be recognised by the World Health Organisation as ‘the most prevalent irreversible industrial disease’. Noise induced hearing loss has been ranked as one of the most serious diseases. It is irreversible but preventable. This directive is intended to protect workers from risks to their health arising from exposure to noise.

NIHL prevalence ranges from 7% in Western countries to 21% in emerging/developing nations.

2 Key requirements of the Noise Directive

What are the key requirements of the Noise Directive?

1. To assess and, if necessary, measure the levels of noise to which workers are exposed.
2. Employers must establish the measures to be taken when the exposure limit values and exposure action values, in respect of the daily noise exposure levels, are exceeded.
3. Employers must, where possible, try to eliminate or minimise the potential risk at source.
4. Where the risk cannot be controlled at source, employees must be provided with suitable personal protective equipment.

“ There is good evidence of some hazard to hearing from prolonged exposure to noise at levels down to 85dB(A) and a residual risk down to 82dB(A) but the magnitude of the hazard increases rapidly above 90dB(A).”

(Source: HSE)

3 Key Points of the Noise Directive

Key Points of the European Noise Directive 2003/10/EC

- **Lower Exposure Action Value 80dB(A) continuous noise and/or 135dB (Peak Sound Level)**
HPE must be made available on request to individual workers when the lower Action Value is exceeded.
- **Upper Exposure Action Value 85dB(A) continuous noise and/or 137dB (Peak Sound Level)**
HPE must be used where the sound level exceeds the Upper Exposure Action Value.
- **Exposure Limit Value 87 dB(A) continuous noise and/or 140dB (Peak Sound Level)**
This must not be exceeded. There is a well defined role for hearing protector in achieving the Limit Value.
- **Audiometric screening initiated at 85dB(A) or between 80 and 85dB(A) where vulnerable workers are identified.**

4 Action and limit values of the Noise Directive

Lower Exposure Action Value:

Where employees are exposed to sound levels at or above 80dB(A) the employer must make suitable hearing protection available to employees on request, but may not enforce its use.

Upper Exposure Action Value:

Where employees are exposed to sound levels at or above 85dB(A) the employer must provide and strictly enforce the use of suitable hearing protection in the affected areas of workplace.

Exposure Limit Value:

The daily exposure Limit Value takes into account the attenuation provided by the individual hearing protectors worn by the worker. This exposure limit value is set as 87dB(A). These limit values refer to the noise level at the ear whilst wearing hearing protection and are absolute maximum limits that must not be exceeded after all control measures have been implemented.

5 Noise effects

The human body may begin to react adversely to noise at around 80dB (A). The effects can be physical, mental or emotional. The effects of noise are not immediately evident. Hearing can deteriorate slowly and almost imperceptibly.

Regular exposure to moderate to high noise levels may cause irreversible hearing problems in the longer term.

Effects at work

- > Communication disturbance
- > Poor concentration
- > Tiredness/fatigue
- > Increased risk of accidents
- > Decrease in productivity

Effects on the body

- > Hypertension
- > Muscular contraction
- > Anxiety and stress
- > Sleep disturbance
- > Tinnitus

Typical Noise Intensity Levels*

Normal conversation	50-60dB
Loud radio	65-75dB
Busy street/Vacuum cleaner	78-85dB
Heavy lorry about 7 metres away	95-100dB
Pighouse at feeding time	110dB
Chain saw	115-120dB
Jet taking off 25 metres away	115-120dB

*Source – HSE Website www.hse.gov.uk/noise