APPENDIX 7 EARS AND HEARING

Prior to purchasing any ear protection, a noise and frequency analysis must be performed to determine the specification.

COMPATIBILITY WITH OTHER PPE

Hearing protection must be compatible with any other PPE being provided. Full guidance on the selection, use, care and maintenance of hearing protection is given in the HSE publication, "L108 Reducing noise at work: Guidance on the Noise at Work Regulations 2005.

Hearing protection should only be used where risks to hearing remain despite the implementation of other measures to control the noise, or while those other measures are being developed or put in place.

TYPES OF HEARING PROTECTION 6.3.3.1

Earplugs are designed to fit against the entrance to the ear canal and provide an airtight seal.

Foam insert plugs are both roll-down or push-in type and come in a variety of sizes and shapes. They are considered the most comfortable plug for long term use (throughout the workday) and offer a high degree of attenuation. Generally, one size fits most, but not all individuals.

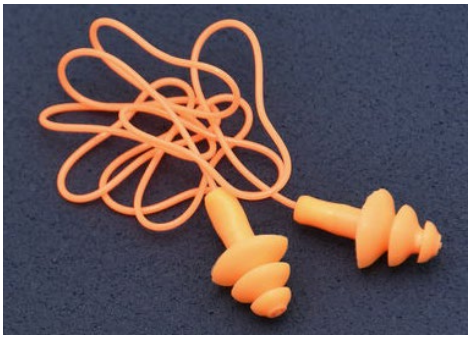
Advantages:

- Suited for use with safety glasses and other forms of personal protective equipment.

Disadvantages:

- Can be hard to fit – will only be effective when fitted properly so correct fitting is essential. See manufacturer's instructions and provide training.
- Difficult to check correct fit by observation.
- Can work loose over time, so allow for refitting in a quiet environment every hour.
- May not be suitable where the hearing protection is likely to be removed often, particularly in dusty or dirty environments.
- May not be suitable for certain individuals due to medical conditions.

Pre-Moulded earplugs are fabricated from soft, flexible materials and come in a variety of sizes. These ear plugs are good devices for users who move in and out of high-noise or hearing protection required areas as they are relatively easy and quick to insert and remove



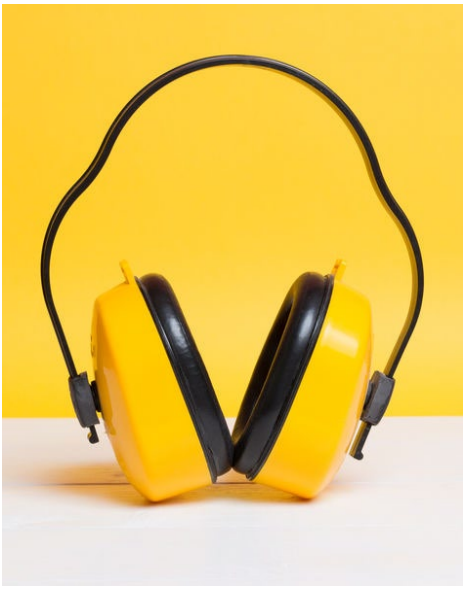
Advantages:

- Suited for use with safety glasses and other forms of personal protective equipment.

Disadvantages:

- Difficult to check correct fit by observation.
- Can work loose over time, so allow for refitting in a quiet environment every hour.
- May not be suitable where the hearing protection is likely to be removed often, particularly in dusty or dirty environments.
- May not be suitable for certain individuals due to medical conditions.

Ear muffs – Ear muffs block sound by totally encompassing the outer ear to form a tight seal against the sides of the head. The noise attenuation of the earmuffs is dependent upon how well the cushions on the cups seal against the sides of the head. In general ear muffs fit a large percentage of people, but not all.



Advantages:

- Easy to fit and use
- Clearly visible therefore easily monitored

Disadvantages:

- Headband can prevent use of a hard hat. Headband can be worn behind the neck or under the chin if an under-hat support strap is provided. However, the protection offered may be reduced.
- May not be suited for use with safety glasses and other forms of personal protective equipment (check compatibility).
- May be uncomfortable in warm conditions.
- Long hair, beards and jewellery may interfere with seals and reduce protection

Combinations of HPDs are typically used in very high noise areas where a combination of ear plugs and ear muffs can be used. It is important to realise that the performance of the combination of the ear plug and ear muff is not determined by simply adding the performance of each individually. Some manufacturers of a range of HPD will have the data for the performance of the combination.

Advantages:

- Can be used to offer higher level of protection

Disadvantages:

- Difficult to calculate exact level of protection
- May interfere with other PPE
- Can become uncomfortable after long period of use
- Difficult to check correct fit by observation of internal ear plug
- May not be suitable for certain individuals due to medical conditions.

Fitting:

Foam insert ear plug – Most foam insert plugs are designed to be rolled down by the user and inserted into the ear canal. After insertion the plug slowly expands and conforms to the individual ear canal shape. The method is as follows “to insert foam earplugs roll them between the thumb and index finger into a very thin crease-free cylinder. The cylinder should be as small in diameter as possible.” “By pulling up on the external ear or down on the lobe, you can straighten out your ear canal, allowing correct and full insertion of the plug into the canal.”

Pre moulded ear plug – Pre moulded earplugs come in varying sizes, such as small, medium and large. Since up to 10 percent of wearers can have two different size ear canals, each ear needs to be fitted separately. HPD manufactures provide ear gauges for sizing ear canals. To obtain a proper fit on multi-flanged plugs at least one of the flanges should completely seal along the interior wall of the ear canal. As with foam insert plugs using the pulling of the ear method is recommended for pre-moulded plugs.

Ear Muffs – Although most earmuffs can successfully fit a large percentage of people, the fitter should check the following:

- Does the headband expand and contract enough to position the cups securely over each outer ear?
- Can the entire ear fit comfortably inside the earmuff cup?
- Does the cup’s cushion seal against the head all the way around the ear, or are there excessive gaps caused by bone structure, bulky eyeglass temples or facial hair?

Maintenance:
Earplugs, primarily re-usable pre-moulded, should be routinely inspected to ensure no damage or physical changes have occurred to the device over time that would inhibit the ability to obtain an airtight seal. Foam plugs may be re-used on average 5-10 times before the cell structure breaks down, which can prevent proper insertion and/or an effective seal. All plugs may be cleaned with a mild soap and water, when needed.
Ear muffs should be checked and cleaned regularly because impressions, cracking, and hardening of cushions can cause air leaks affecting the attenuation. Replacement cushions are available from the manufacturer although it may be more cost effective to replace the aged ear muffs rather than keeping stocks of replacement cushions. The headband should be routinely inspected to ensure it still provides adequate pressure to seal the ear cups against the side of the head. The ear muffs should also be cleaned after use as these may be equipment specific and not personal.

NOISE-LEVEL CHECKS BY THE SAFETY DEPARTMENT

The College must provide hearing protection and hearing protection zones at 85 decibels (average/ daily exposure). The level at which departments must make a workers' risk assessment and provide information and training is **80 decibels**. There is also a ceiling limit of 87 decibels (taking into account hearing protection) above which workers should not be exposed.

The Safety Department will conduct noise-level checks on request and provide advice on the relevant hearing protection (where this is appropriate rather than other controls).

RELEVANT STANDARDS (2021)

BS EN 352 – 1: 2020 - Earmuffs.
BS EN 352 – 2: 2020 - Earplugs.
BS EN 352 – 3: 2020 - Earmuffs attached to an industrial safety helmet.
BS EN 352 – 4: 2020 - Level dependent earmuffs.
BS EN 352 – 5: 2020 - Active noise reduction earmuffs.
BS EN 352 – 6: 2020 - Earmuffs with safety related audio input.
BS EN 352 – 7: 2020 - Level dependent earplugs.
BS EN 352-8:2020 - Hearing protectors – entertainment audio earmuffs.