



Prevention of Noise Induced Hearing Loss

Hearing Protection – Personal Moulded Ear Plugs ProtectHear

Introduction

The HSE estimates that over one million employees in the UK are exposed to levels of noise that put their hearing at risk and around 170,000 people in the UK suffer deafness, tinnitus or other ear conditions as a result of exposure to excessive noise at work. Medical evidence suggests that people may actually be prone to damage from continuous noise exposure at levels as low as 70 dB (A). HSE research has found that 60% of workers do not wear hearing protection correctly.

Background

At Source QX was initially approached by Network Rail in 2006. They had concerns because the contractors wearing earmuffs to protect against the equipment noise during vegetation cutting could not hear either oncoming trains or their warning horn.

Following a meeting with Network Rail, trials were set up at three permanent way locations, Croydon, Reading and Colchester. This was an initial process to see how the track workers would react to wearing personally moulded earplugs and to get feedback through a questionnaire (Appendix1). An additional trial involving maintenance workers at Taunton was added in December 2006. The feedback was positive and as a result a formal trialing of ProtectHear earplugs against all trackside equipment was undertaken at Didcot in June 2007. A flyer with frequently asked questions was developed to go alongside the trial.

The trial was against what Network Rail were currently using i.e. disposables ear plugs and earmuffs. These types of hearing protection are known as 'Passive' protectors. These protect the individual by acting as a physical barrier between the user and the noise source. The trial did not involve any other personally moulded earplugs. The main aim of the first trial was to see if they did what At Source QX ProtectHear claimed i.e. the user would be protected whilst still being able to hear trains and the warning horn. Once this had been established more formal trials checking the suitability against all the equipment used trackside were undertaken, verification of the noise output of the equipment was compared to the attenuation of their earplugs.

Noise measurements of the equipment were already known to the Health & Safety Department but what was more interesting was to check that the track workers could hear the train warning horn over the noise of the equipment being used and at what distance from the actual work place.

Comprehensive trials were undertaken and eventually a matrix (Appendix 3) was generated to compare what Hearing Protection could be used with what equipment. Initially 2 chain

saws used did not pass with ProtectHear. Additional trials were arranged in 2010 at Manchester and now all equipment is usable with the ProtectHear earplugs.

Following the Didcot trials ProtectHear was approved by Network Rail, a 'flyer' was designed for inclusion in their PPE catalogue and went live on the IPROC ordering system in August 2007. Since then, At Source QX has supplied just over 2000 pairs to Network Rail staff across the country.

Benefits of ProtectHear

The main benefits of **ProtectHear** include:

- Hear speech, shouted warnings and alarms whilst being protected
- Does not over-protect
- Has a life span of 5 years
- Very comfortable and easy to clean
- The ability to hard-wire connect to personal radios or Bluetooth headsets
- Can be worn with all other PPE
- **ProtectHear** has a pay back of approximately 8 months compared with disposables
- Eco-Friendly, 1 pair of **ProtectHear** against 4800 disposables over 5 years

Five pairs of disposable plugs per day at 18p per pair represents a £20000 annual spend per 100 workers, compared to £6-7,000 over five years for moulded ear protection so there are considerable savings..

Personal Protection

As most employers already know personal protective equipment (PPE) should only be used when all other options have been exhausted, as a temporary measure whilst other controls are being adopted, or during an emergency. They should never be chosen in preference to another control measures. Employers should ensure that all hearing protection affords adequate protection and it should be compatible with all other forms of PPE used. When purchasing ear protectors the supplier should provide test data showing the attenuation of sound provided. The data should describe the average attenuation and that provided when the protectors are worn by different people of different shape and size. Hearing protectors only provide adequate protection if they fit, are worn correctly, and are used whenever the employee is exposed to high noise levels. There are several types of hearing protectors on the market, and hundreds of makes and models. The type chosen should depend on the level of protection required, comfort, and whether the protection needs to be compatible with other forms of PPE, such as hard hats. Employees may have different head shapes, long hair, thick spectacle frames, jewellery, etc which may adversely affect the seal to the head.

Types of Ear Protection

The types of ear protection available are:

Disposable Earplugs

These fit into the ear canal, and may be attached to a cord or neckband to prevent them being lost. They are made of compressible material and will fit into most ears. As they are discarded after each use they are more hygienic than permanent re-usable earplugs.

Permanent Re-usable Earplugs

These work in the same way as disposable earplugs, but are made of rubber or plastic. They come in various sizes and in order to work, the correct size must be fitted. Certain workers may require different sizes for each ear. Universal fitting plugs are available but the protection afforded is not as good as properly fitted individual-sized plugs. All such plugs should be regularly washed.

Canal Caps Supported by Headband/Semi-inserts.

These are pre-moulded ear caps attached to a headband, which presses them against the entrance of the ear canal. One size of cap fits most people. Over long periods of time these may be uncomfortable as the pressure on the ear canals may be too harsh, however they are light and can be worn around the neck when not in use.

Earmuffs

Hard plastic cups that fit over and surround the ears, sealed to the head with cushion seals, with their inner surfaces covered with a sound-absorbent material. A headband is used to hold and press the muff to the head. One size will fit most people, they are easy to wear, and they can be adapted to allow the passage of low-intensity signals without attenuation. Some muffs are marked 'left' and 'right' ear and the wearer should be informed of which way to wear them.

Before commencing work, an employee should examine the hearing protection to check:

- Condition of the seals.
- Tension of headbands.
- Overall condition and cleanliness of the protector.
- Resilience and softness of earplugs - if disposables are used, a new pair should be used daily and the old pair should be discarded.

Hearing protectors should be replaced if they are damaged; the seals are torn or hardened, or the lining is exposed; if the earplugs are not soft and resilient; or if head bands have lost their tension.

Earplugs should be issued on an individual basis and if earmuffs are to be shared they should be cleaned between usages. Earplugs should not be inserted using dirty hands. Muffs and plugs should be stored in a clean safe place.

Before any ear protection is issued, the user should be questioned about any ear problems, such as earache or ear infections, and those who experience, or have experienced, associated issues should be referred their doctor for treatment.



ProtectHear User Questionnaire

This questionnaire has been devised to assess the performance and suitability of ProtectHear within your organisation.

Please complete the whole questionnaire by circling answers or supplying further information.

<u>Name:</u>	
<u>Department:</u>	
<u>Position:</u>	
<u>Name/make of current ear protection:</u>	

1. Was it easy to obtain a good fit with ProtectHear?	
Yes	No
2. Are ProtectHear comfortable?	
Yes	No
3. Are ProtectHear effective at reducing external noise?	
Yes	No
4. Do ProtectHear allow you to hear speech and audible warnings?	
Yes	No
5. Are ProtectHear easy to clean?	

Yes		No	
6. How well do ProtectHear compare with your previous protection?			
Better	Same		Worse
7. If you had the choice would you keep using ProtectHear?			
Yes		No	

Further comments:	

Appendix 2: Network Rail Protection Data.

	Recommended On Track Hearing Protection		Recommended Off Track Hearing Protection					Present Hearing Protection
	N400/PHYKV C ProtectHear personalised Hearing protection	Peltor H9B	Moldex Spark Plug Cord	N400/PHYKVC ProtectHear personalised Hearing protection	Moldex Spark Plug Soft	Peltor H10A	Peltor H10B	N254/199000 Keep Safe Blue Cyclone Ear Muffs
								
Voice	60	60	68	60	68	60	60	60
Whistle	60	72	66	60	66	71	71	72
Horn	80	77	64	80	64	75	75	77
Chainsaw	78	84	78	78	78	77	77	88
Brushcutter	80	82	79	80	79	79	79	82

12" Disc Cutter	77	77	70	77	70	70	70	76		
Pole saw	77	68	71	77	71	71	71	74		
Angle Grinder	74	77	70	74	70	70	70	73		
MP12 Profile Grinder	67	74		67				70	70	69
MC3 Switch Grinder	72	77		72				70	70	72
Weldbaby Welding Generator	62	71		62				62	62	69
MPM225A Welding generator	60	71		60				62	62	64
Needle Gun	72	72		72				68	68	68
Cobra TT	74	74		74				68	68	75
Rail Drill	70	77		70				70	70	70
14" Rail Disc Cutter	75	77		75				70	70	72
Impact Wrench	77	78		77				70	70	73

Protection does not give adequate protection or it 'over protects'

Protector gives adequate protection, and does not 'over-protect'