

### Noise

Exposure to high levels of noise can lead to hearing loss. With hearing loss comes the added effects of physical and social problems. Depending on intensity, level and period of exposure, workers may suffer temporary or permanent deafness. Noise induced hazards depend on frequency (or pitch) and intensity. Frequency is measured in hertz (Hz) and sound intensity in decibels (dB). There is a huge difference between 10dB as the intensity increases tenfold, therefore the damage is significantly more as decibels increase.



The following table outlines the noise (measured in decibels) of sounds that could be produced in a film, television or theatre environment along with noises with which most people are familiar.

Type of sound	dB	Intensity
Quiet whisper	10	10
Whirring of computers, monitors	30	1,000
Normal level conversation	50	100,000
Office Environment	60	1,000,000
Traffic	80	100,000,000
Set Construction - drilling, hammering	110	100,000,000,000
Engine room	120	1,000,000,000,000
Jet engine	130	10,000,000,000,000
Firearm discharge (eg. gun)	140+	1,000,000,000,000,000

Some frequencies below 20Hz (low hum) which the human ear can not hear can cause headaches, nausea and giddiness usually occurring around heavy machinery. Similarly, these effects can be experienced above 16,000Hz (high pitch - above human hearing ability) and may be caused by jet engines or electronic equipment. Temporary hearing loss can be induced especially when starting out in noisy conditions, usually above 80dB. It takes ten years of this degree of exposure to lead to permanent hearing loss. Temporary hearing loss is therefore more of a risk to film and television production workers. Film and television crew may shoot a scene in noisy conditions for a few days (e.g. at an airport) so are not being exposed to a constant noise over a period of years. Sometimes, temporary hearing loss can be experienced when working in a noisy location, however, if your hearing does not regain its former state after a couple of days, it is quite possible that the damage has become permanent.



Set construction poses a threat as workers are exposed to noise measuring around 110dB. Hearing protection must be worn in areas emitting noise of 85dB(A) or above. Discharging firearms exposes cast and crew to high noise levels (140+ dB) but can be controlled by restricting workers from coming within a certain distance of the noise. Sound pressure that workers are exposed to must not exceed 140dB. The person discharging the firearm must wear personal ear protection. Extreme caution must be exercised when firearms are being used. The noise they produce is extreme, often greater than that of a jet plane. Ears feel sore, ear drums experience extreme pressure and a hum or ringing sound may be heard - these effects can be felt when hearing loud noise and continue after the noise is gone.



Another hazard created by noise is the immediate danger of being unable to hear instructions or warnings. Without these directions, the safety of cast and crew is affected. This is especially the case for camera operators wearing headphones attached to their camera and sound recorders connected to their microphones. Wearing headphones limits their ability to hear useful information. They must ensure they set their headphones at a reasonable level so as not to damage their hearing. A noise survey measures sound pressure and frequency to identify and put in place risk management.

Personal hearing protection is one form of controlling noise levels. Personal protective equipment should only be used if the source of the noise can not be eliminated. Wear appropriate ear protection such as ear plugs or ear muffs on noisy locations or around deafening machinery. Take care, however, as it is impossible to wear them at all times during a shift. There is also the risk that the equipment may be broken. Remember that they can also be a barrier against verbal communication. Workers need to be trained in correct use of hearing protection equipment. Employers must ensure the equipment is checked and maintained regularly.

In sound studios, crew need to control speakers by playing them at a reasonable level, avoiding blaring volume. It is recommended that they take regular breaks in a peaceful environment to break the exposure of continuous sound. In theatre, test audio levels first by completing a sound check and then proceed with a run-through. By doing this, the audience and crew do not have to hear unnecessarily loud speech, music or effects. Another method of limiting noise exposure to workers is rotating shifts providing a balanced roster. Changing where workers are needed can reduce the level of noise exposure although this can be difficult in arranging for specialised employees. Australian standards requires that signs stating 'hearing protection areas' be posted in noise areas above 85dB(A).

Areas of possible high level noise exposure on locations in the film and television industry include

- race-tracks,
- airports,
- shooting ranges,
- machinery plants,
- concerts, live band performances.

If you are attending a film shoot on one of these locations, you should be wearing person-

al protective ear equipment and taking precautionary methods such as regular breaks away from the noise. (**Note:** When working on a tarmac area of an airfield, the pilot must determine the distance that will place the aircraft no less than 50 metres above a camera. The pilot is also responsible for deciding the appropriate stopping distance that will place the camera no less than 50 metres away from the aircraft. A safety person will be assigned to each camera person working on the tarmac. Only approved persons are permitted in landing areas.)

## QUIZ QUESTIONS

1. What unit is used to measure sound intensity? \_\_\_\_\_

2. What are two effects caused by exposure to high levels of noise?

i) \_\_\_\_\_

ii) \_\_\_\_\_

3. Temporary hearing loss can be induced above what noise level?

- a) 50 dB.
- b) 80 dB.
- c) 110 dB.
- d) 140 dB.

Answer: \_\_\_\_\_

4. Hearing protective equipment must be worn in areas exceeding:

- a) 50 dB.
- b) 80 dB.
- c) 110 dB.
- d) 140 dB.

Answer: \_\_\_\_\_

5. Which of the following conditions could expose entertainment industry workers to high risk noise levels?

- a) Office.
- b) Traffic.
- c) Airport.
- d) Firearm discharge.
- e) Edit suite/control room.
- f) Rock concerts.

Answer: \_\_\_\_\_

6. Apart from physical harm to the ear itself, what other hazard does noise create?

\_\_\_\_\_

7. Name another measure apart from personal protective equipment that can be used to reduce noise exposure.
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8. Australian Standards require signs be posted in noise areas above:
- a) 50 dB.
  - b) 85 dB.
  - c) 100 dB.
  - d) 140 dB.

Answer: \_\_\_\_\_

9. When working on the tarmac, what is the correct distance in metres allowed between the camera and the aircraft (both above and away from)?
- a) 30m.
  - b) 50m.
  - c) 80m.

Answer: \_\_\_\_\_