

# REVIEW OF LITERATURE ON HEARING DAMAGE BY PERSONAL STEREO

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## 1. INTRODUCTION

The major part of our knowledge about noise-induced hearing loss relates to industrial noise exposure. This experience is hard-earned. Industrial workers exposed to high sound pressure levels are known to be at risk, and hearing protection devices shall be offered and used, if the level exceeds a certain limit given by national legislation. Also other professions may include the risk of suffering hearing damage. Musicians are exposed to high sound pressure levels, depending on the music and instrument they play, and they will often feel their performance obstructed, if hearing protection is worn.

Less attention has historically been given to exposures from leisure activities, where the individual—usually unknowingly—controls the exposure parameters. There has been little reason to worry about these, and the primary concern has—with good reason—been firearms and shotguns for hunting.

In recent decades a range of personal audio devices have emerged, offering high quality, loud music. The technological achievements are impressive, and the continued miniaturization incl. amplifiers and transducers breaks boundaries constantly. Recent years' mp3 players, such as the iPods are little wonders, which allow us to listen to high quality music at the scene of our choice. Unfortunately, also to exceedingly loud music for some.

This study was inspired by what appears to generally conservative conclusions in the literature, on the possible risk of damage from personal stereo systems (PSSs). One aspect relates to the methods for estimating the exposure levels of PSS users. When the sound is presented by earphones, e.g. inserted in the ear, the standardized methods for measurement and assessment of the noise exposure were inapplicable, until the publication of the ISO 11904 series, with Part 1: "Technique using a microphone in a real ear (MIRE technique)" in 2002 and Part 2: "Technique using a

manikin" in 2004 (see also [1]). Although several of the previous studies employed methods, which were in principle quite similar to the ones later laid down in the standards, the interpretation of the results may have been overly cautious. In the present paper, statements from previous studies have been considered with a view to the now internationally accepted method for determining noise immission from source close to the ears.

## 2. CONCLUSIONS

Generally, it is found that the habits of the users and levels used, would raise concern for 5-25% of the user population. In one study [2], it is demonstrated to relate to the specific use in situations with high levels of background noise, which is often the case for MP3 player users. Another study [3], demonstrates that the effect of using personal stereo is comparable to that of being exposed to noise in industry. The results are discussed in view of the measurement methods for noise exposure used.

## 3. REFERENCES

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