HAZARDS FROM NOISE AT WORK

Information provided within the framework of the Austrian Occupational Safety and Health Strategy on the initiative of the Federal Guild Group of Ancillary Construction Trades (Bundesinnungsgruppe Baunebengewerbe)

INTRODUCTION

The use of machinery and vehicles makes workers' tasks easier while at the same time increasing productivity. Yet the use of machinery can also have detrimental effects such as noise, which is disturbing and can cause hearing damage.
Extended exposure to a high level of noise causes noise-induced hearing loss (NIHL). Hearing damage can, however, also be induced by very brief and extremely loud impulse noise. NIHL is one of the most common occupational diseases, resulting not only in high costs to society but also in a tremendous loss of quality of life for those suffering from the condition.

Deafness due to noise cannot be treated or healed!
Everyone must therefore strive to prevent deafness due to noise, through technical, organisational and personal measures to protect against hearing loss.

The regulation on noise and vibrations (VOLV) requires employers to comply with the maximum noise levels specified in the regulation.

WHAT IS NOISE?

Audible sound experienced as negative is termed noise. Noise can disturb people, cause psychological and physical stress and, at high levels, hearing damage. There is also a risk of an accident where noise hinders oral communication or the perception of signals.

Noise nuisance results from the intensity of the sound and the length of time a person is exposed to it.
Even a single occurrence of impulse noise can lead to hearing damage (e.g. acoustic shock).

To avoid hearing damage, workers should not be exposed to noise exceeding the exposure action value for noise posing a hearing risk, which is an average level of 80 dB standardised to eight or 40 hours or a peak level of 135 dB.

EFFECTS OF NOISE ON HEALTH

Exposure to noise can pose a wide variety of health and safety risks for workers. These include:

- Hearing loss (deafness due to noise)
- Tinnitus
- Ruptured eardrum, acoustic shock
- Noise-related stress and other conditions

ADVERSE EFFECTS OF NOISE

- Psychological effects:
  - inner tension, heightened irritability to the point of aggressiveness, concentration disorders, nervousness
- Reduced performance at work
  - reduced ability to concentrate, slower thought processes, reduced agility
- reduced speech abilities
- vegetative reactions such as stress, increased blood pressure, disruptions of gastrointestinal activity, delayed neural signal processing

Exposure limit values, exposure action values, limit values (from the VOLV)

EXPOSURE LIMIT VALUES (HEARING RISK)	
Average permanent noise level	85 dB(A)
Peak level	137 dB(C)
EXPOSURE ACTION VALUES (HEARING RISK)	
Average permanent noise level	80 dB(A)
Peak level	135 dB(C)
LIMIT VALUES FOR ADVERSE EFFECTS	
Areas where mainly mental/intellectual activities are performed	50 dB(A)
Areas where simple office work is are performed	65 dB(A)
Rest areas and areas where workers are on call	50 dB(A)

The permanent noise level to which workers are exposed is used to determine whether exposure to noise poses a hearing risk. The permanent noise level is an average taken over eight hours or, where noise levels vary strongly over the day, over 40 hours. In the case of disturbing noise, tonal components and impulsiveness have to be considered as well.
Acoustic measurements are required where noise conditions cannot be assessed by referring to information such as manufacturer specifications in operating manuals, databases with comparable data or calculations.

WHEN ARE HEARING PROTECTORS NECESSARY?

Workers must be provided with suitable hearing protectors when they have to be present in areas where the action value of 80 dB is exceeded despite making full use of all possible measures. Hearing protectors must always be worn when an exposure limit value is exceeded.

WHAT STEPS ARE REQUIRED WHEN AN EXPOSURE ACTION VALUE IS EXCEEDED?

When an exposure action value is exceeded, employees are required to be informed of the exposure action values and exposure limit values, of potential action for avoiding noise, of the effects of noise on health, and of the proper use of hearing protectors, and they are required to be instructed on these topics.

EXAMPLES OF NOISE EXPOSURE

MACHINERY / WORK ACTIVITY	NOISE LEVEL [dB(a)]
Disc grinder	95 - 105
Punch press	85 - 100
Welding	75 - 90
Turning machine	75 - 85
Straightening	100 - 120
Straightening sheet metal	- 130
Mill saw	90 - 95
Circular table saw	85 - 100
Band saw	80 - 90
Trimming saw	100 - 105
Thickness planer	90 - 100
Jointer	90 - 100
Hand sander	~ 90

USE OF HEARING PROTECTORS

- Select the proper hearing protectors depending on intended use, e.g. ear defenders for brief use, ear plugs in dusty or dirty areas
- Select hearing protectors with suitable attenuation, avoid under-protection as well as over-protection
- Properly insert earplugs, do not reuse disposable earplugs
- Store hearing protectors under hygienic conditions and in the area where they are to be used
- Use hearing protectors consistently and continuously; removing them for even only a brief period can drastically reduce the protective benefits

WHAT STEPS ARE REQUIRED WHEN AN EXPOSURE LIMIT VALUE IS EXCEEDED?

When an exposure limit value is exceeded, measures must be taken to reduce noise.
Usually collective (i.e. technical and organisational) noise protection measures must first be taken in order to reduce exposure. The use of hearing protectors to reduce the exposure of individual workers to a level below the limit value is only permitted where collective measures prove inadequate.

MEASURES AFFECTING BUILDING STRUCTURE AND ROOM ACOUSTICS

Such measures aimed at avoiding or reducing noise exposure involve the design and arrangement of rooms and workplaces. Areas exposed to noise should in general be kept as small as possible.

MEASURES AFFECTING THE SOURCE

- Introduce less noisy working procedures, e.g. reduced use of compressed air jets
- Use and purchase work equipment with lower noise emissions (e.g. quieter machinery) – heed the manufacturer's specifications!
- Ensure regular maintenance of work equipment as well as related connecting and installation parts
- Use less noisy tools (e.g. circular saw blades)

TECHNICAL AND ORGANISATIONAL MEASURES

- Do noisy jobs in separate rooms
- Measures to reduce airborne noise (shielding, encapsulating or covering noise sources with sound-absorbing materials; reduce structure-borne noise using soundproofing or acoustic insulation)
- Increase the distance to the noise source
- Reduce noise through proper handling of work equipment
- Limit exposure periods by taking a break or doing less noisy jobs once the limit value is reached

Noisy areas in which noise exposure may exceed the limit values must be designated accordingly.
A list is required to be kept of those workers who are exposed to noise exceeding an exposure limit value.

HEALTH SURVEILLANCE

In the event that an exposure limit value is exceeded, an initial medical examination is to take place before workers begin their jobs, with a follow-up examination taking place every five years.
Where noise exposure exceeds an exposure action value, the worker affected must be offered an appropriate medical examination in the event that risk assessment and evaluation indicate a risk to the worker's health.

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