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TransAtlanticSafety

HEARING PROTECTION ATTENUATION

The use of hearing protection devices is one of the key components of a successful hearing conservation programme. Therefore, it is essential to correctly estimate potential noise attenuation provided by a hearing protection device to fulfil your duties under the Control of Noise at Work Regulations 2005.

In the UK, there are 3 prescribed methods to do that:

- Octave-band - Requires detailed data on the frequency content of the noise, and uses information on the attenuation of the protector at specified frequencies. This is the most accurate method to estimate attenuation but requires more data, such as the octave-band spectrum.
- HML - Three values H, M and L are used with two simple measurements of the sound pressure level. This is a simpler method to estimate evaluation that requires A-weighted and C-weighted average sound pressure levels.
- SNR - The simplest method of assessment that only requires a C-weighted average sound pressure level.

Approved Code of Practice L108 describes in great detail the calculations involved in these methods; however, the UK HSE has created an online calculator that is much easier and quicker to use.
Source: ACOP L108 p.103.

OCTAVE-BAND METHOD

Hearing Protection Calculator - Octave-band method

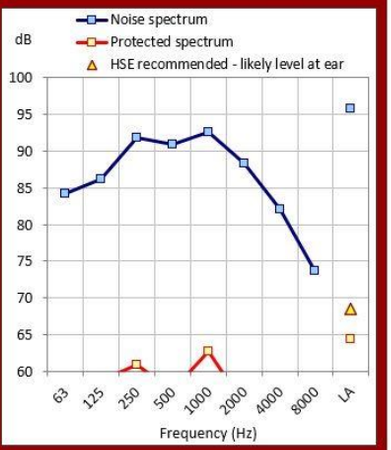
Version 1.01 December 2020

The Octave-band method of hearing protection calculation uses:

- **Octave-band attenuation and standard deviation data** (available from the hearing protector supplier)
- **Octave-band workplace noise levels** (un-weighted values)

HEARING PROTECTOR	Make/Model:	Howard Leight Laser Lite						
Frequency (Hz)	63 *(opt.)*	125	250	500	1000	2000	4000	8000
Mean attenuation (dB)	33.4	34.1	35.5	37.6	34.9	35.7	42.5	44.1
Standard deviation (dB)	4.6	6.7	4.6	4.1	5.0	2.8	2.9	4.2
Assumed protection (dB)	28.8	27.4	30.9	33.5	29.9	32.9	39.6	39.9

WORKPLACE NOISE	Location/Machine:	Fan 25/100						
Frequency (Hz)	63 *(opt.)*	125	250	500	1000	2000	4000	8000
Unprotected Spectrum (dB)	84.2	86.2	91.8	90.9	92.6	88.3	82.0	73.7
Protected Spectrum (dB)	55.4	58.8	60.9	57.4	62.7	55.4	42.4	33.8



Introduction

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Unprotected noise level at the ear	L_A	95.7	dB(A)
Protected noise level at the ear	L'_A	64.5	dB(A)
HSE recommended value for the likely noise level at the ear	$L'_A + 4$	**68**	dB(A)
Protection rating:	?	*Over-protection*	

H-M-L METHOD

Hearing Protection Calculator - HML method

Version 1.01 December 2020

The HML method of hearing protection calculation uses:

- **H, M and L data**, available from the hearing protector supplier
- **A-weighted (L_A or L_{Aeq}) and C-weighted (L_C or L_{Ceq}) noise levels at the workplace**

NOTE: the L_{Ceq} value should not be confused with the peak noise level L_{Cpeak}, which is also measured in units of dB(C)

HEARING PROTECTOR	WORKPLACE NOISE
Howard Leight Laser Light	Fan 25/100

HML values			Weighted level		Protected noise level at the ear	HSE recommended value for the likely noise level at the ear	Protection rating ?
H	M	L	L_A	L_C	$(L'_A = L_A - PNR)$	$(L'_A + 4)$	
dB	dB	dB	dB(A)	dB(C)	dB(A)	dB(A)	
34	32	31	96	103	65	**69**	*Over-protection*

SNR METHOD

Hearing Protection Calculator - SNR method

Version 1.01 December 2020

The SNR method of hearing protection calculation uses:

- **SNR value**, available from the hearing protector supplier
- **C-weighted (L_C or L_{Ceq}) noise levels at the workplace**

NOTE: the L_{Ceq} value should not be confused with the peak noise level L_{Cpeak}, which is also measured in units of dB(C)

HEARING PROTECTOR	WORKPLACE NOISE
Make/Model:	*Location/Machine:*

SNR value	C-weighted Level	Protected noise level at the ear	HSE recommended value for the likely noise level at the ear	Protection rating ?
SNR	L_C	$(L'_A = L_C - SNR)$	$(L'_A + 4)$	
dB	dB(C)	dB	dB(A)	
35	103	68	**72**	*Good*