

Appendix 6

Computation of Actual Noise Reduction Ratings (NRR)*

- The degree of protection that a hearing protection device provides is referred to as the Noise Reduction Rating or NRR. Because the listed NRR is established for C-weighted noise measurements, and our measurements have been collected using an A-scale, 7 dB will be subtracted from the NRR to take this into account.
- NRRs for ear protection are established in laboratory settings under ideal conditions, and it is unlikely that the noise reduction in industrial areas will be as substantial as that recorded in the lab. Because of these differences between laboratory and “real world” performance, the following NIOSH de-rating scale will be used when calculating noise reduction:

Hearing Protection Device	De-rating Scale
Ear muffs	7 dB
Formable ear plugs	7 dB
All other earplugs or semi-aural devices	7 dB

- Using this method, a formable earplug with a NRR of 30 dB actually provides:
 - 30 dB (listed NRR) - 7 (A-scale to C-scale adjustment) = 23 dBA reduction - laboratory measurement
 - 23 dBA = "real-world" noise reduction.
- For cases where both muffs and plugs are used, deduct the -7 from the highest NRR rated device. Then add +5 for the 2nd device. The total is the “real-world” noise reduction.
 - Muffs have 30 dB (listed NRR) – 7 (A-scale to C-scale adjustment) = 23 dBA
 - Add 5 dB for the plugs = 28 dBA reduction total
- Products with the highest NRR are not always the best choice for hearing protection. Too much noise reduction, when not necessary, can lead to degradation of communication, especially in individuals who have some degree of hearing loss.
- Communication problems associated with maximum NRR devices may lead to accidents and poor employee acceptance of the HCP.
- The following general guide to protection levels will be used:

If the device reduces the noise to:	Then the protection is:
> 90dB	Insufficient
85 - 90 dB	Acceptable
75 - 85 dB	Good
70 - 75 dB	Acceptable
<70 dB	Too high