Noise Exposure and Hearing Conservation Plan - Appendix B: Evaluating Noise Reduction Ratings (NRR) of Hearing Protectors

Scenario: Exposure to a noise level of 100 dBA from a lawnmower.

What offers better protection, earplugs with a NRR of 33 dB or earmuffs with a NRR of 25 dBA (over the ear)?

Used alone, and when fitted properly, the earplugs would result in a reduced noise exposure of 87 dBA.

> Noise reduction due to ear plugs = (33 - 7)/2 = 13
>
> Exposure with ear plugs = 100 dBA – 13 = 87 dBA
>
> Effectively reduces noise levels below the OR OSHA PEL of 90 dBA

Used alone, and when fitten properly and worrn over the ear, the earmuffs would result in a reduced noise exposure of xx dBA.

> Noise reduction due to earmuffs = (25 – 7)/2 = 9
>
> Exposure with earmuffs = 100 dBA – 9 = 91 dBA
>
> Not effective at reducing noise levels below the OR OSHA PEL of 90 dBA

Using both ear muffs and plugs in combination, one adds 5 dB of protection to the higher NRR, i.e., 33 dB to yield a combined NRR of 38.

> Reduction due to combination of muffs and plugs = (38 – 7)/2 = 15.5
>
> Exposure with both muffs and plugs = 100 dBA – 15.5 = 84.5 dBA
>
> Effectively reduces noise levels below the OR OSHA PEL of 90 dBA and the OR OSHA Action Level of 85 dBA.