



Absorbent Pads and Earmuffs



We work in a humid environment and use moisture-absorbing pads with our earmuffs. Do the absorbent pads affect the attenuation of the earmuff?

Earmuff users know that anything interfering with a good seal around the ear (thick hair and eyeglass frames or large earrings) can potentially compromise the attenuation of the earmuff. Workers who wear the absorbent pads, such as the Bilson® Cool® II pads, may likewise wonder if their earmuff attenuation is being compromised.

Cool II pads come with an adhesive backing that attaches directly to the earmuff cushion. As an option, the punched oval center of the Cool II pad may also be placed inside the earcup to protect the foam filling of the earmuff. Cool II is ideal for humid and moist environments, for users who perspire heavily or for settings where the same earmuff is shared among multiple users.

In a study conducted at the Howard Leight Acoustical Laboratory, the Cool II pad was tested with a representative earmuff (Bilson® Thunder® T2). Hearing tests were administered to listeners while they wore the earmuff alone, and then with the pad attached, to determine any change in earmuff attenuation.

Table 1. **Change in attenuation measurements (in dB) across all frequencies for the earmuff alone, and earmuff with Cool® II pad.***

Frequency in Hz	125	250	500	1000	2000	3150	4000	6300	8000
Difference with Cool II	-2.5	-2.3	-2.7	-0.4	+0.5	-0.2	-0.7	+0.6	+0.4
Difference with Cool II + Punched Center	-1.6	-1.6	-2.8	-0.2	+0.7	-2.0	+2.3	+1.8	+1.1

*Positive values mean more attenuation

The results in Table 1 show that the addition of the Cool II pad causes a mild drop in attenuation of about 2.5 dB in the low frequency response (500 Hz and below) of the earmuff, but no significant difference above 500 Hz. The addition of the punched oval center into the earcup actually increases attenuation in the earcup by about 1 – 2 dB in the high frequencies (4000 Hz and above).

If we apply these results to the Noise Reduction Rating (NRR), the addition of the Cool II pad would decrease the NRR of an earmuff by 1 dB or less. Using the Cool II with the punched oval center pad in the earcup would decrease the NRR by about .5 dB. These minor changes in overall attenuation (1 dB or less) are within the standard deviation of the testing, and will likely be unnoticeable and insignificant to most users when compared with the benefits of extra comfort, longer wear time and additional hygiene provided by the Cool II absorbent pads.

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