

Earbuds/Noise Cancelling Headphones versus Hearing Protection Devices (HPD)



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- HPDs are noise reduction-rated products by EPA-accredited laboratories.
- Navy instruction prohibits listening to music using headphones/earbuds in high noise hazard work areas.

If you are considering using earbuds or noise-cancelling headphones as your hearing protection device, it is important to remember that noise-cancelling headphones and earbuds are not primarily hearing protection devices (HPD). HPDs are noise reduction-rated products by EPA-accredited laboratories. HPDs such as earmuffs and earplugs physically block out sound while noise-cancelling headphones such as earbuds use active noise cancellation technology to reduce low-frequency ambient noise. Earmuffs or earplugs work by creating a physical barrier between the ear and the external noise source. In contrast, earbuds use microphones to detect incoming sound waves and create an opposite waveform that negates the original sound.



DID YOU KNOW?

Active-noise cancellation (ANC) headphones are equipped with tiny microphones that emit sound waves of opposing signals to that of incoming sound waves from your environment, thus creating a cancelling effect. Microphones must capture the noise, and the phase of the cancellation waveform leaving the headphone drivers needs to perfectly line up with the phase of the noise when it reaches your ear. To guarantee a high level of noise cancellation, these systems need to be finely tuned and precise. "ANC headphones or earbuds should not be considered hearing protection devices unless labeled with an NRR." – NIOSH

Active noise-reduction technology is most effective at reducing background noise which could not be equally rated as occupational noise. Noise-cancelling headphones are often powered by batteries and may require some setup before use, so they are not ideal for immediate protection against occupational noise exposure. Additionally, the Navy Safety and Occupational Health Manual, OPNAV M-5100.23, prohibits listening to music using headphones or earbuds in industrial areas and in work areas where high noise hazards are identified.

HEARING PROTECTION DEVICES		EARBUDS / HEADPHONES	
<p>APPEARANCE</p> <p>EARMUFFS</p>  <p>EARPLUGS</p> 		<p>APPEARANCE</p> 	
<p>NOISE-REDUCTION RATING (NRR)</p> <p>The NRR describes the average sound level reduction (attenuation) provided by the HPD under laboratory test conditions regulated by the EPA (the higher the NRR, the greater the noise reduction). This label is required by EPA.</p> 		<p>NOISE-REDUCTION RATING (NRR)</p> <p>No NRR label</p> <p>They are neither rated for noise reduction nor primarily designed for hearing protection.</p> <p>Designed to negate unwanted ambient sounds.</p> <p>They are not designed to provide the amount of attenuation required for impact noise.</p>	

For more information, email NAVSAFECOM_CODE20_ASHORE@navy.mil or visit navalsafetycommand.navy.mil

