

The New Generation of Hearing Protectors

What you need to know



There are many different models of hearing protectors on the market, which can complicate things when purchasing a hearing protection device (HPD).

This document will help you make an informed decision so that you can protect yourself from the harmful effects of noise.



IMPORTANT

The hearing protection device (HPD)

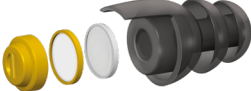
- Must be a protection strategy of last resort. The use of an HPD does not relieve the employer of the responsibility to put in place the necessary reasonable means to **reduce the noise at the source** (s. 135, RROHS)
- Must comply with the CSA standard “Hearing Protection Devices – Performance, Selection, Care and Use” (Z94.2) in accordance with the Regulation respecting occupational health and safety (RROHS). **Headphones sold with “active noise cancellation” are not considered hearing protectors** because it has not been proven that they comply with the standard
- Must be worn correctly for the entire duration of exposure
- Must meet the worker’s need to understand and perceive their sound environment in order to **ensure their safety and auditory health**. The choice of HPD must take into account the need to communicate with coworkers as well as to locate and recognize various sound signals (alarm, etc.)
- Requires an **adaptation period** to get used to wearing it, due to the occlusion effect

Before making your purchase, consider the following elements:

- Levels and types of noise depending on the workplace situation
- Characteristics of different hearing protectors
- Regulatory requirements
- Comfort
- Cost


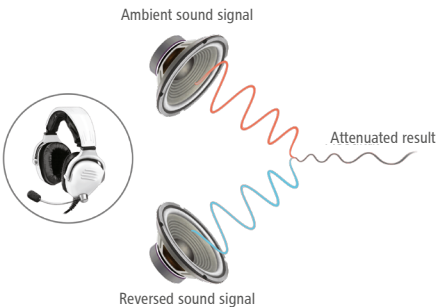


What is the occlusion effect?

It is the unpleasant sensation of your own voice sounding different (hollow or booming echo-like sound) when wearing an HPD. Generally, the occlusion effect is greater with earplugs than earmuffs. This discomfort sometimes leads users to wear the device incorrectly or to take it off.

Type of hearing protector	Operating principle/characteristics
Passive protector: Noise is reduced through the use of an insulating material	
<p>Uniform attenuation</p> <ul style="list-style-type: none"> • With the addition of acoustic filters • Linear attenuation 	<ul style="list-style-type: none"> • Better known as the “musician’s hearing protector” • Filter offers more realistic perception of the sound environment and improves the audibility of speech and essential sounds • Exposure to noise levels below 92 dBA • Recommended for workers with hearing loss (high frequencies)
<p>Attenuation based on level of ambient noise</p> <ul style="list-style-type: none"> • Mechanical device inserted in the hearing protector • Slight attenuation in environments with low noise levels • Maximum attenuation during exposure to high impulse noises 	<ul style="list-style-type: none"> • Facilitates verbal communication from one work area to another, without having to remove the hearing protectors, regardless of the noise level • Recommended for spaces with impulse or impact noises <p>E.g., for hunters, police officers, soldiers</p>

There is a difference between the noise reduction rating indicated on the HPD packaging (IRB/NRR) and the real protection in the workplace. It is appropriate to calculate the effective level of exposure for passive HPDs:

[Annexe E - Guide sur la sélection et l'utilisation des protecteurs auditifs_CNESST](#)

Type of hearing protector	Operating principle/characteristics
Active protector: Noise is reduced through the use of an electronic device	
<p>Sound restoration</p> 	<ul style="list-style-type: none"> • External microphone and internal speaker with control to amplify low-intensity noises. These are perceived at a level equal to or greater than that obtained without hearing protection • Recommended during exposure to noise of varying intensity since it helps with perception of voices and sound signals
<p>Active noise reduction (ANR)</p> 	<ul style="list-style-type: none"> • Internal microphone captures ambient sound signals. The signal is amplified and transmitted to an “anti-noise” speaker • “Anti-noise” speaker reverses the sound signal. The combination of these two signals reduces the noise level. This is referred to as “active cancellation”
<p>Integrated communication system (radio/Bluetooth)</p> 	<ul style="list-style-type: none"> • Bidirectional communication system • Microphone and speaker with volume control • Boom microphone/Bone conduction/Ear microphone
<p>Specialized</p> <p>Can combine:</p> <ul style="list-style-type: none"> • AM/FM radio • Active noise reduction (ANR) • Integrated communication system • Music input • Sound restoration • Pairing with smart phone 	<ul style="list-style-type: none"> • Listening to music can pose safety risks by masking environmental sounds that must be heard • The level of noise exposure of a user listening to music from their HPD is increased by 15 dBA • To be used with vigilance

Each type of HPD **MUST** be equipped with a device that limits the level of the sound signal to below 85 dBA.

Regulatory changes		
Timeline	Actions	RROHS section
June 16, 2023	Reduction of the exposure limit value: 85 dBA	131
June 15, 2024	Identification of workplace situations that present a risk of overexposure (> 85 dBA) CNESST tools: <ul style="list-style-type: none"> • Voice test • Identification grid for workplace situations that present a risk 	133
By June 15, 2025	For workplace situations identified as presenting a risk: <ul style="list-style-type: none"> • Provide HPDs or reduce the duration of exposure • Train workers on the use of HPDs (theory and practice) • Identify reasonable means for reducing the noise source and start implementation 	136 141 141.2 134 135
By June 15, 2028	Complete implementation of the reasonable means If the reasonable means are insufficient: <ul style="list-style-type: none"> • Continue to provide HPDs and/or reduce the duration of exposure • Continue training workers on the use of HPDs (theory and practice) 	136 141.2
	Reassess the reasonable means: start a new 5-year cycle The complete process must be reviewed each time there is a change in the workplace situation. However, implementation of reasonable means is 30 days	133 134
By July 15, 2028	Measure the noise exposure Inform the workers of the results	138 141.4

Do you need assistance
selecting a hearing
protection device based on
your workplace situation?

Équipe de Santé au travail des Laurentides

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Réseau de santé publique en santé au travail (RSPSAT)

The Réseau de santé publique en santé au travail (RSPSAT) brings together the Santé au travail (occupational health) teams of the Direction de santé publique (public health department) from each region of Québec.

The RSPSAT sees to the protection of Québec workers' health by providing support to workplaces.

The RSPSAT's actions, based on prevention, involves assessing workplace risks, providing information related to health impacts, conducting medical monitoring activities and support to control or eliminate these risks.

www.santeautravail.qc.ca

For more information, please contact the Santé au travail (occupational health) team of the Direction de santé publique (public health department) for your region.

References

Canadian Standards Association (CSA). 2015. Z94.2-14 confirmed 2019. "Hearing Protection Devices – Performance, Selection, Care and Use." 57 p.

CNESST. 2023. *Prise en charge des risques liés à l'exposition au bruit en milieu de travail – Guide sur la sélection et l'utilisation des protecteurs auditifs*
www.cnesst.gouv.qc.ca/sites/default/files/documents/guide-selection-utilisation-protecteurs-auditifs.pdf

Gouvernement du Québec. Regulation respecting occupational health and safety (chapiter S-2.1, r. 13). [RSST_Section XV](#)

Nélisse, H., IRSST. 2023. Au-delà des protecteurs auditifs « classiques ». Private PowerPoint presentation.