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Find Serenity with Phonak

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Advertorial

We live in a noisy world and seem to have accepted it as part of our daily lives. Observe any group of people nowadays and note how many are wearing some sort of earphone. It is ubiquitous.

According to the World Health Organization, 1.1 billion people are estimated to be at risk for noise-induced hearing loss around the world.[1] Furthermore, exposure to noise can have effects beyond the audiogram, such as tinnitus, inducing stress and reducing general health and well-being.[2] When you consider that noise can be defined as any 'unwanted and/or harmful sound', it's clear that unwanted sound can intrude on a variety of activities and have a negative impact. Think of trying to sleep with a loudly snoring partner![3]

Phonak has introduced a line of Serenity universal and custom ear protection products this year and I spoke to **Logan McMeekin, Phonak's Learning Manager**, to find out more.

Can you tell me why Phonak has entered into the noise protection market?

We already support people in the detection and management of hearing loss categories and we are now closing that circle and offering a product line to hopefully prevent hearing loss. This furthers our commitment to one of our core philosophies at Phonak of **Well Hearing is Well Being**. From a clinical perspective though it also offers some unique opportunities to attract clients earlier in their hearing loss journey. So, now we have a comprehensive portfolio from protection to detection and management solutions.

Some may ask, "Why should I, as a hearing care professional, include hearing protection as part of my services?"

Phonak conducted a 15 minute online survey of 6420 participants to find out about their awareness of hearing protection offerings and what would be important to them when choosing hearing protection. This was done in 5 countries (US, UK, Germany, France and Netherlands). The target group was people 15-65 without hearing aids.

This revealed that when shopping for hearing protection, they identified Hearing Healthcare Professionals as their preferred source for these items. Good news for Audiologists!

Unfortunately though, the awareness of hearing protection is still very low amongst the general population. A survey in the US, undertaken by the CDC (2020), found that 70% of people exposed to loud noise never or seldom wear hearing protection. As a consequence of this the same survey found that 40 million U.S. adults have audiograms that are consistent with hearing loss resulting from exposure to loud noise.[4]

So Logan, you've mentioned the numbers affected by noise exposure and the low uptake of noise protection use. What are some of the barriers to noise protection use?

The reasons for not using ear protection are varied, but below are some of the more common ones[3] :

- discomfort (including humidity in the ear)
- concerns about over-protection/not being able to hear enough
- differential attenuation / spectral distortion across frequency
- occlusion (especially when singing/playing wind instruments)
- training/ease of handling/fit testing

What particular features of the Phonak Serenity Choice Universal and Custom products address some of these concerns?

The Phonak Serenity product range has specific design characteristics to overcome some of these barriers.

We are using a patented filter design to help clients be able to hear people around them while they are wearing Serenity products. After all, the goal is to keep the protection in their ears for the full duration of the noise exposure, so we don't want them pulling them in and out in order to hear someone speak beside them.

Unlike many plugs that have traditional resistive tube filters, the Phonak Serenity choice plugs adopt high-end membrane and mesh filters that attenuate both low and high frequencies more evenly, to allow situational awareness and communication (Figure 1).



Figure 1: (A) – Traditional resistive tube filter which attenuates mostly high frequencies and (B) – Phonak Serenity Choice mesh and membrane filters.

I see there are Universal and Custom ranges – can you tell me why there are both?

Having both allows for flexibility in meeting a range of needs. For those just wanting some mild to moderate protection in specific environments, the off-the-shelf Serenity Choice universal solution may be a good introductory product. Phonak offers 6 different options (motor sports, music, sleep, comfort, shooting & work) that are also illustrated on the different packaging. This makes selection for consumers easier. Each package contains a mesh filter, 3 different ear tip sizes and a carrying keychain case.

However, if someone is looking for something that demands more consistent use and a custom fit, then the Serenity Choice Plus custom solution offers more flexibility in terms of the fit, materials and filter options.

I know if I have anything in my ears for too long, moisture build up can cause discomfort and can be an issue. How has this been addressed in the Serenity products?

You're correct, moisture build up (ear canal humidity > 70%) can cause discomfort and make the continued use of the noise protection a problem.

Phonak did some measurements to assess the humidity in the ears for several participants using a special measurement tool that can be inserted in the ear and can measure the humidity for a given time period.[5]

What was found, was that even as time went on, the ear canals with the Serenity Choice ear plugs all remained below the 70% humidity threshold of discomfort. So, our filter system allows for breathability and therefore comfort over time.

On the product information pages I see reference to NRR & SNR – can you tell me what these mean?

When it comes to the amount of attenuation provided by hearing protection, there are different standards by which that these values can be obtained. In North America, we use the ANSI standard of **Noise Reduction Rating (NRR**). This is represented by a single number, that represents an average of the octave bands measured.

The **Single Number Rating (SNR)** is also a single number of overall attenuation, but often is displayed in three values of High (H), Medium (M) and Low (L) frequency ranges. It is used by the European standard (EN-352-2).

They both give an estimate of the level of noise reduction that the hearing protection device can provide but the testing procedure to achieve the values is slightly different.

By subtracting the standard deviation once (CE) or twice (ANSI) from the mean attenuation you will know that 95% (for CE data) and 98% (for ANSI data) of people will experience at least that attenuation value at each octave band.

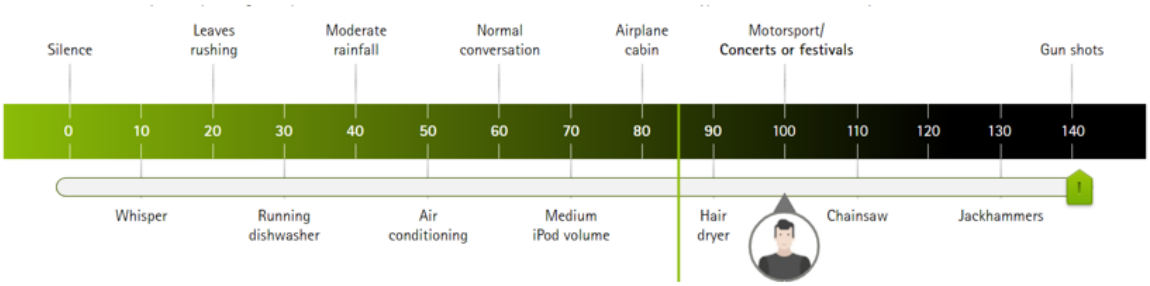
So, all of our Serenity Choice products have had a certificate issued because we are compliant with both standards. We also publish this information on the packaging for the universal solutions as well as on the specification sheets for the custom solutions.

How do you know which filter to select for which use case?

In a perfect world, your clients would be able to tell you what NRR rating they need for their specific listening environment. In most workplaces that have workplace safety representatives, they know exactly whatNRR rating is required to make the environment safe for the worker. And yes, I am reminded that there really is 'no safe level' of sound, but from an industry perspective, these standards, in dB A values, have been set. The reality is that these are not the clients you will be fitting since their noise protection is taken care of on the job for them. Therefore, we don't know the dB A noise rating of their environment, so let the dB A vs dB SPL war begin!

Your customer base will be varied: from someone who uses a lot of power tools, musicians, dentists, parents concerned with loud music, people who race cars/motorcycles and much more! You will still certainly see people working in noise, but maybe the company doesn't have workplace safety representation, so you will need to recommend the best protection for them.

The good news is that all of our filters have their own frequency response curves available. For example, if you have someone who is a landscaper and looking for protection all day, then we can look at some standard noise levels (such as a simplified version of the chart below) and they would likely be exposed at a similar noise level of motorsports (dirt bikes, motorcycles, etc.). If he is using the lawnmower on average 4 hours a day, then we could look at the Recommended Noise exposure levels that are published and for four hours, the max level is 88 dB. So, he would need at least 12dB of protection. The Serenity Choice+ with a 15 filter would be fine, but if exposed for longer, he would need more.



This is a very simplified calculation. In yet another perfect world, we would be able to estimate the level of noise that our clients are exposed to and subtract the average filter attenuation for every example, but we also need to consider the dBA vs dB SPL and make sure we are subtracting apples from apples.

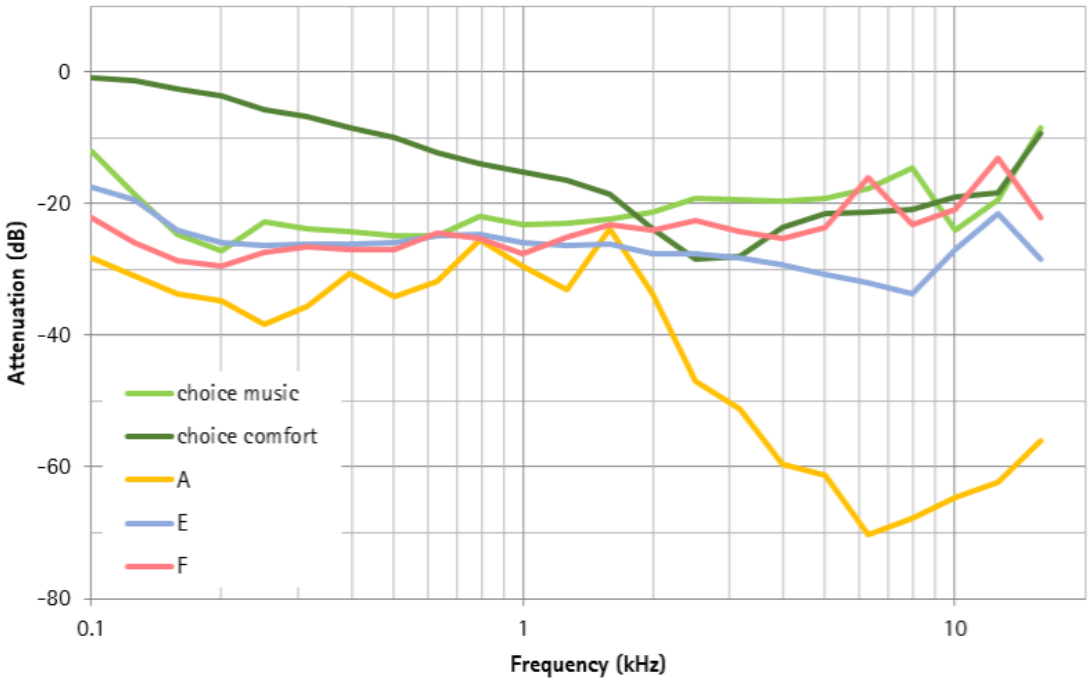
So, how do you know if you can just subtract the average filter attenuation from the estimated noise level of the environment? Well, thanks to people who have studied this topic, we know that if most of the noise exposure being measured is above 1000 Hz, then there is negligible difference between these two measures because a higher pitched sound will have a very similar dB and dBA levels.[6] This is good news for musicians, but for noisy industries with sounds below 1000 Hz, we know that these lower frequency sounds are not processed as effectively through the ear, so they have a lower output level. So, you want to keep this in mind when recommending a specific filter for hearing protection.

When I think of noise protection, I personally first tend to think of Hunters and then Musicians. How are the filters for these two groups different in the Phonak Serenity products?

We have two very different filters for these two use cases you are asking about.

The noise exposure that hunters will face is very different from someone who is a landscaper. Their exposure is in much shorter increments and much louder. The Serenity products are designed with a special filter that provides more attenuation as the impulse noise level increases. For our Serenity Hunting products, we provide you with the IPIL (Impulsive Peak Insertion Loss) ratings for impulse sounds at 133, 150 and 166 dB since we know that gunshots are measured between 130 and 170 dB SPL.

As for musicians, we have another set of filters that have the flatter frequency responses that musicians are looking for. We also have different filter options to choose from for our custom Serenity Choice products (15, 20 and 25 dB average attenuation). We conducted some measurements of our music filters and you can see in the illustration below (Figure 3) that our universal Serenity product has a nice flat frequency response. This would be a great solution for an occasional musician who isn't interested in custom protection. For those who are interested in a certain amount of attenuation, based on what instruments they are playing, then we would recommend choosing a custom product where they can select a different filter (all of which have nice flat frequency responses).[6]



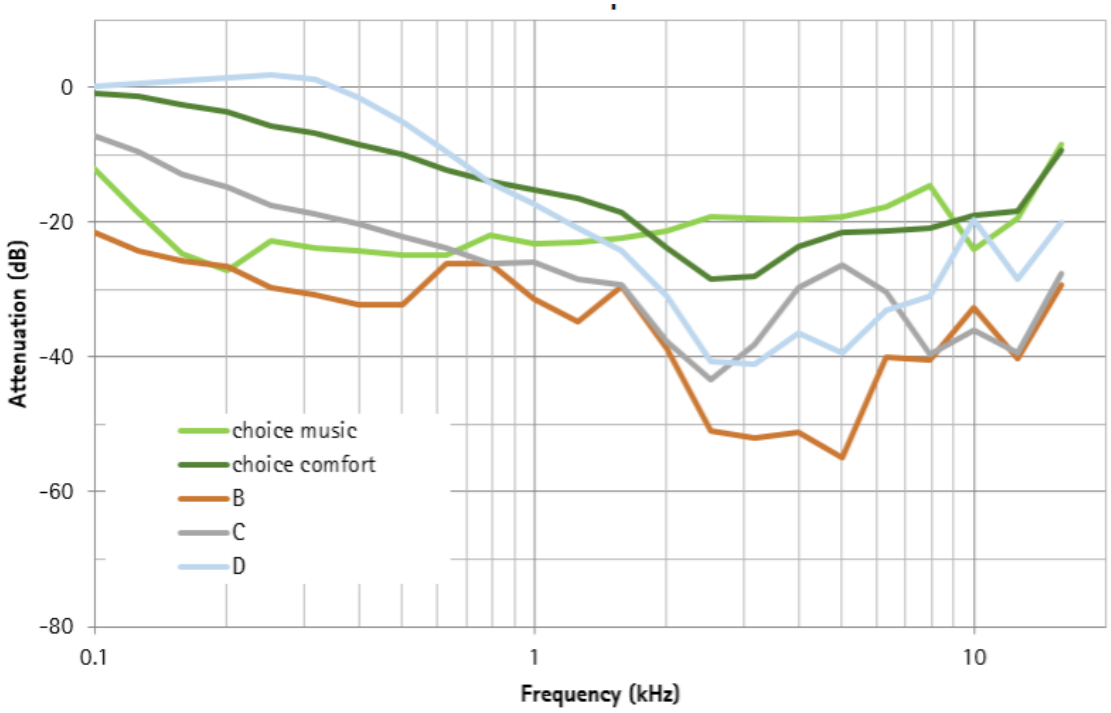


Figure 3.0: Attenuation curves of Serenity Choice Music, Serenity Choice Comfort and 6 competitor products (A, B, C, D, E and F).

Logan, I'd like to thank you so much for answering all my questions. It has been interesting to see how Phonak has expanded its product offering to include products that will aid in preventing hearing loss. This holistic approach definitely speaks to their Well Hearing is Well Being philosophy.

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