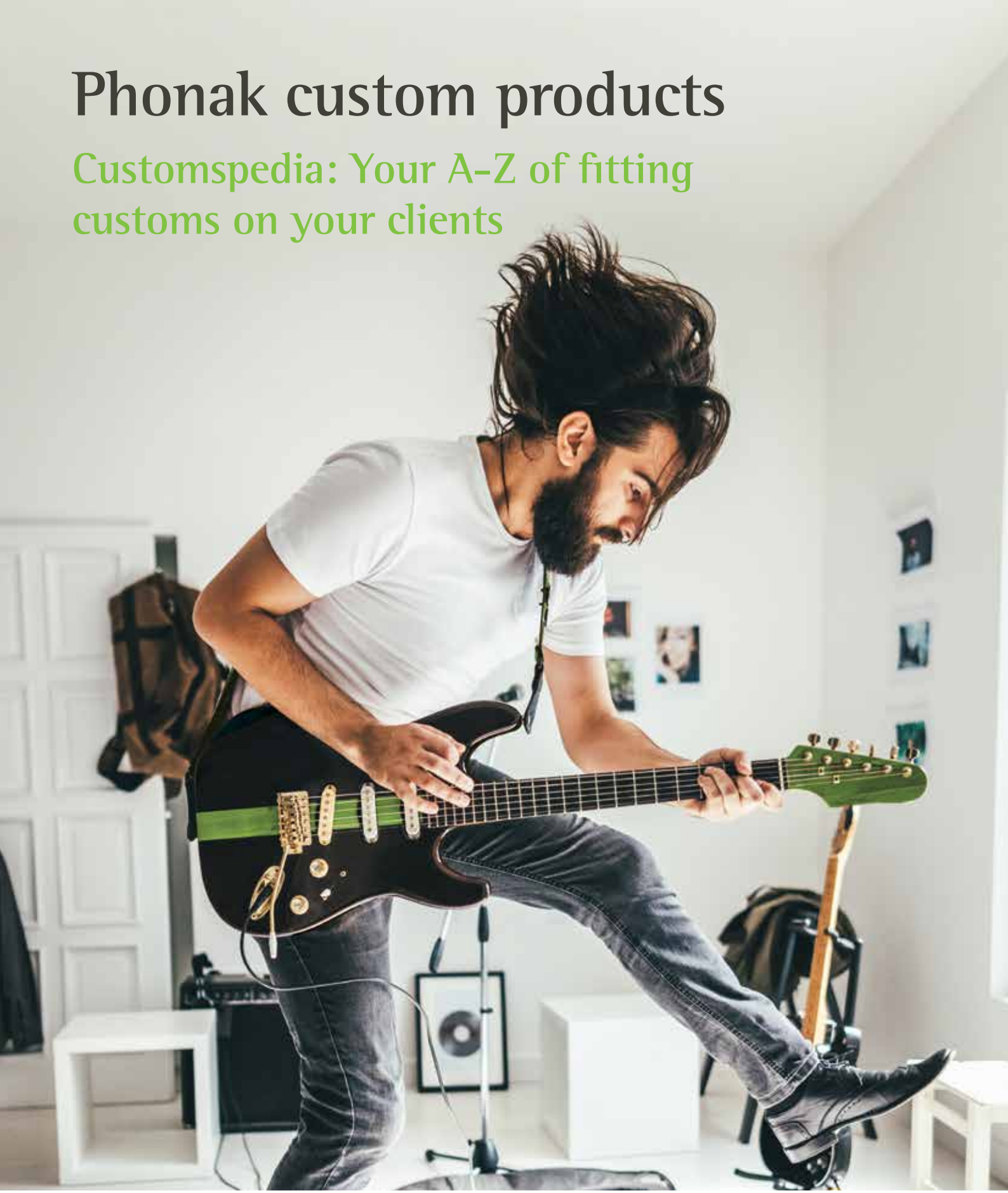
Phonak custom products

Customspedia: Your A-Z of fitting customs on your clients



A Sonova brand

PHONAK
life is on

A better fit for your clients... and for you

Customisation in a patient's hearing technology can be essential to achieve optimal hearing performance for your patients. Partner with Phonak to leverage our patented processes in production to provide your patients the best custom hearing solutions, quickly.

Get a competitive edge in today's evolving hearing healthcare marketplace, by meeting the unique needs of each patient - especially those who require customisation. Phonak is here to help you get a better fit.

Benefits of custom hearing instruments

Custom products including cShell, SlimTip, and In-The-Ear (ITE) instruments offer numerous benefits to people with hearing loss. From a performance perspective, custom moulds on Behind-The-Ear (BTE) style hearing aids can provide consistency of placement, improved retention and consequently offer a more comfortable fit. ITEs can fit discreetly behind the tragus, reducing exposure to wind, and providing a cosmetically appealing solution. Lastly, custom ITE products offer ergonomic advantages in that their one piece design can make them easier to remove and insert.

Audiological Benefit

- No one ear is like another; a custom product takes into account the variation in any given ear canal
- Greater chance of first fit success
- Greater retention[1]
- Higher maximal stable gain[2]
- Reduced risk of feedback[3]
- Relative to an open fit, BTEs with custom moulds have greater directionality and consequently greater performance in background noise[4,5]

Clinic Benefit

- Quality made products that reflect a high level of professionalism

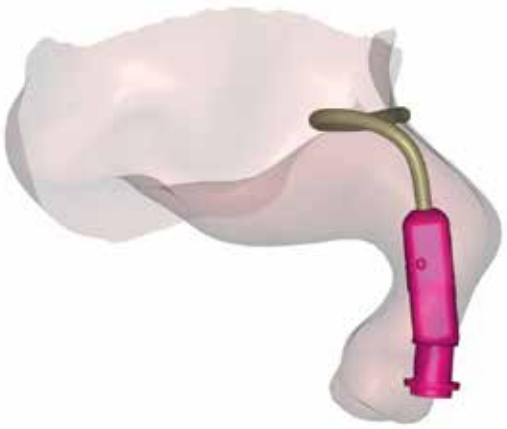
1. West, M. "Earmolds and more: Maximizing patient satisfaction." (2005) Retrieved from http://www.audiologyonline.com/articles/earmolds-and-more-maximizingpatient-850.
2. Dillon, H "Advanced Signal Processing Schemes" Hearing Aids 2nd Edition. Turramurra. Boomerang Press. 2012: 236-238.
3. Maxwell, JA, and Zurek, PM. "Reducing Acoustic Feedback in Hearing Aids." IEEE Transactions on Speech and Audio Processing. 3.4. 1995: 304-13. Web.
4. Kuk, K., Keenan. "How do vents affect hearing aid performance?" Hearing Review, 2006: 34–42.
5. Magnusson, L., Claesson, A., Persson, M., & Tengstrand, T. Speech recognition in noise using bilateral open-fit hearing aids: The limited benefit of directional microphones and noise reduction." International Journal of Audiology, 2013, 52, 29–36.

When domes just don't do the trick

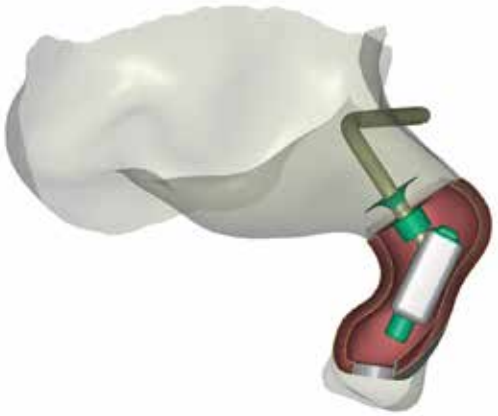
Off the shelf receivers, SlimTubes and domes are a great way to fit clients quickly, but 'one size fits all' is a statement that does not apply to hearing instruments.

In some cases, hearing aid receivers and tubes are too straight or too wide in places, compromising a comfortable or optimal fit. Custom products give more flexibility to provide better comfort, retention and performance, as illustrated in the case study below.

In the example here is a standard receiver in the canal. Because the 'off-the-shelf' item is all one piece, positioning the wire correctly results in the tip forcing its way into the canal wall (and this is without fitting a dome!). This will result in significant discomfort if the client can insert the receiver fully. It is more likely that they will not be able to insert it beyond the first bend, resulting in poor retention and seal. Consequently, the sound outlet is directed at the canal wall, which can have an impact on the feedback margin.



Here is the same ear showing the cross section of a cShell, modelled with a standard receiver. Because the wire, faceplate, receiver and sound tube are all separate pieces, we are able to model and create a solution where the sound outlet is in the optimal position. The result is discreet, with better retention, seal and comfort.

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Your clients deserve a great first fit

Deep impressions made easy

Ear mould impressions are the foundation of all custom product production. They are also among the riskiest procedures that a Hearing Care Providers (HCP) has within their scope of practice, due to the nearness of the otoblock to the tympanic membrane.

The EasyView Otoblock is an innovative approach for taking deep ear impressions. It provides visualisation and light to the deep ear canal throughout insertion which enables the provider to confidently place the otoblock while keeping full view of the proximity to the ear drum.

The otoblock is constructed with a Lyric seal with a medial transparent lens. It attaches directly onto the end of an otoscope to allow full visualisation of the ear canal and tympanic membrane during placement.

It is compatible with standard impression making materials and stays on the impression during the scanning process to add an average of 6mm more canal length information[1].

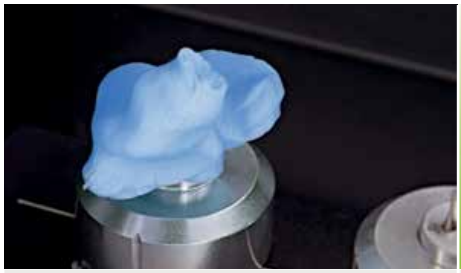
HCPs benefit because they are able to take deep ear impressions comfortably and confidently. Their clients benefit because the outcome of a quality deep ear impression is a small, secure, optimised custom product.

To order the EasyView Otoblock, contact your local Phonak representative or order from the eStore.

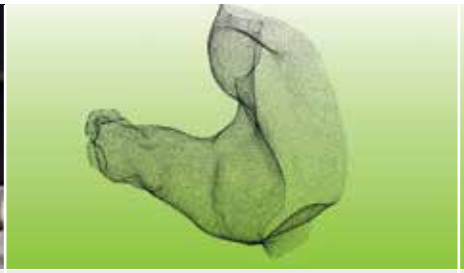
1. Schwarlos-Sooprayen, J.K. (2017) Phonak Field Study: Field Study: Deeper earimpressions with EasyView Otoblock. https://www.phonakpro.com/com/en/resources/information Patent publication numbers: EP3198891B1, US10070235B2.

Your clients deserve
a great first fit

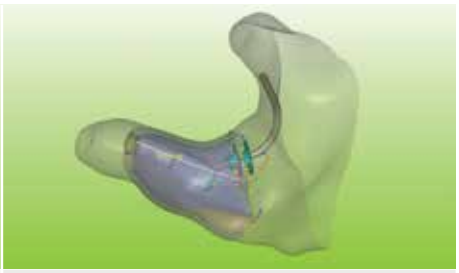
Our custom production process uses a proprietary technology – Rapid Shell Modeling (RSM) — to generate virtual 3D hearing instrument shells. RSM captures thousands of data points from an individual ear impression to help ensure an exact fit and determine the optimal placement of components. The end result is the smallest possible, best-fitting device with the technology and features your clients need.



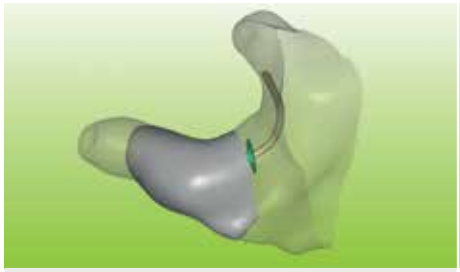
1. The process begins with the digital scanning of each client's ear impression, which is stored for future reference in case of a style change or lost custom product.



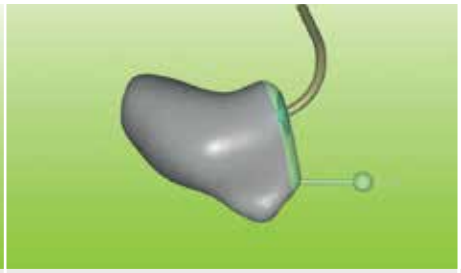
2. The virtual build begins with our proprietary 3D modelling software, which converts the digital scan into a point cloud model with thousands of reference points.



3. The optimum placement of components and venting options is then determined, taking into account the individual's anatomy and audiological needs.



4. The finished build shown inside the cast, is the result of our sophisticated technology, combined with the experience and skill of our modelling technicians, allowing us to create the smallest possible hearing instrument for each client.



5. The finished build, shown outside the cast, concludes the virtual modelling, built with all the parts necessary and ensuring order accuracy. The shell can then be printed using 3D technology.

6. The individually customised finished product is discreet and built for a great first-fit experience.

Biometric Calibration

For ITE hearing aids our modelling software encompasses a technology called Biometric Calibration. The Biometric Calibration algorithm extracts over 1600 unique data points from the client's ear impression, enabling an accurate representation of the unique features of any given ear. These points are compared to a standard ear model that knows how to reflect sound. The differences between the client's ear and the reference ear are calculated and a unique algorithm is created which will optimise directionality in the individual's ear.

Occlusion – we've got the solution

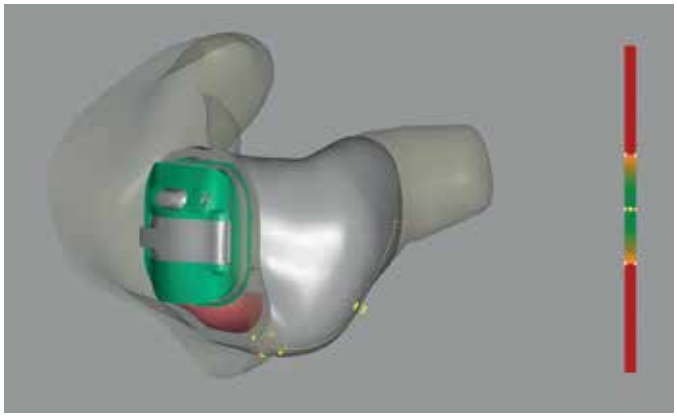
No one wants hearing aid wearers to experience occlusion and this is a common reason why hearing care professionals may select a dome over a custom tip. Occlusion arises when low frequency energy from the wearer's voice enters the ear canal via bone conduction and becomes trapped in the canal due to the presence of a shell or mould. This can result in a 'boomy' or 'hollow' sensation during vocalisation. Occlusion can be altered by reducing the acoustic mass through venting.

Acoustic mass

Reducing occlusion is all about modifying the acoustic mass of air within a vent system. In any given vent, it is easier for low frequency sound to overcome the inertia of acoustic mass. Increasing the cross sectional area and/or decreasing the length of a vent reduces the acoustic mass. This opens a pathway for low frequencies, consequently reducing the occlusion effect.

AOV venting

Phonak's proprietary AOV (Acoustically Optimised Venting), is an algorithm which takes into account the unique characteristics of each client, including the audiometric configuration, risk of feedback, likelihood of occlusion, benefit of direct sound, and the need for low-frequency gain. The proprietary formula then creates an individualised vent size specifically for each client. Designed to prioritise size, AOV gives clients a smaller, more discreet hearing aid, while HCPs benefit from hearing aids that are returned less often than those with a manually selected vent.[1]



Shell optmisation and modification

Our experienced Shell Lab will model and modify the vent and the shape of the mould/shell to reduce or mitigate the occlusion effect. To achieve the optimal acoustic mass given the infinite variations in individual anatomy, we are able to model the custom product using various venting styles.

1. Leuthold, N. (2019). Internal Phonak report. Please contact claims@phonak.com if you are interested in further information.

Custom product
venting styles

Phonak custom hearing instruments are available with a wide variety of venting options. The most effective vent diameter and style is determined by our Rapid Shell Modeling (RSM) technology, in conjunction with Phonak's AOV algorithm. A combination of the styles shown below is used to achieve the balance between seal and ventilation.

Conventional vent
- Parallel tube running through the shell or mould

Conical
- Tapered vent shape
- Different entry and exit diameter
- Maximises venting when space is limited at one end

D shaped
- Allows for larger venting while maintaining space for internal components
- More effectively utilises the width of the canal

Semi-IROS
- Vent cut back at canal tip
- Vent channel is shorter and therefore more open
- Can also be used to ease insertion

IROS
- Vent shortened by cutting back both ends
- Very open

Inverse IROS
- Section is removed from the center of vent
- Shortens the vent while maintaining retention

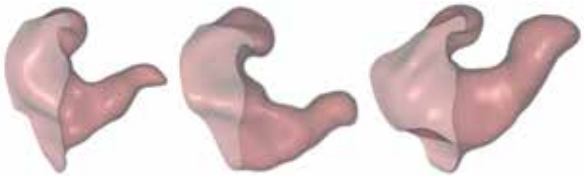
Trench
- Groove cut along the exterior of the shell
- Used when internal space is too limited to fit a conventional vent

Cavity
- A hole in the tip of hollow SlimTip style moulds
- The most open option available
- Pictured mould shown as cross section

Factors that influence size

Many factors influence the possible shell size for a client. The individual's anatomy, the receiver power level, venting size, battery size and other options all play a part. It is important to keep these factors in mind to manage the client's size expectations.

There is an infinite variety of individual ear anatomy:



Venting size

1 or 2 microphones? User controls? Wireless or non-wireless?

Battery size

Power levels: The receivers

These receivers vary in width and length. It is important to note that some ear canals have smaller geometries which may not accommodate large receivers. When this happens the receiver must be placed within the concha and a more discreet size is not achievable. Thus a CIC (Completely in the Canal) with size 10 battery may become a mini-canal, or a canal model with 312 battery may become a half shell or even larger.

cShells: Different styles for different ears

You may have noticed that cShells sometimes look a little different from one order to the next. For most orders, the receiver wire exits the cShell through the faceplate. This is the most discreet option, but is not always possible. When the canal is very small, or a large receiver is required, sometimes the faceplate profile cannot be made low enough for the wire to exit in the conventional way. In these cases a 'cShell XL' is produced with the wire exiting from the top of the shell —this allows the profile to be higher while keeping the wire flush. This solution is commonly required with UP receiver.

cShell A custom shell option for Receiver-In-The-Canal (RIC) devices.

cShell XL A larger cShell option; the receiver wire exits from the top of the shell to allow space inside for a larger receiver.

SlimTip vs cShell

Which is the right custom product for your RIC clients?
How can you tell if a SlimTip or a cShell will give the best outcome for your client? These two custom options each have their own pros and cons.

SlimTip

Pros:

- Receivers can be replaced in the clinic
- The most open custom fitting available when built with cavity venting
- Usually physically smaller in the hand
- Available in silicone (solid), which some clients find more comfortable

Cons:

- Not suitable for narrow or sharply bent canals
- Hollow style can be more challenging to keep clean
- Limited to Cerustop wax protection system
- Limited control over wire/tube and sound outlet angle placement

cShell

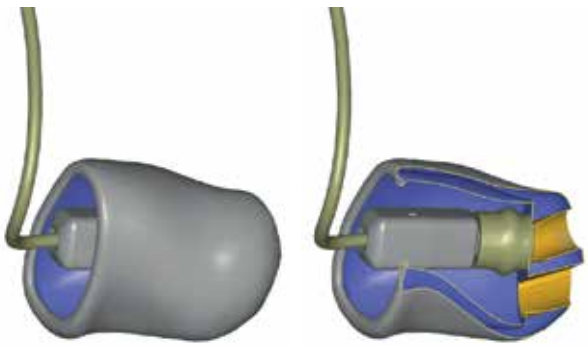
Pros:

- Can be made for almost any ear
- Receiver wire and sound outlet position can be adjusted separately, resulting in better overall fit
- Available with the full range of receivers, including UP
- Available with various wax protection systems (model dependent)
- More durable than a hollow SlimTip
- The most customisable option

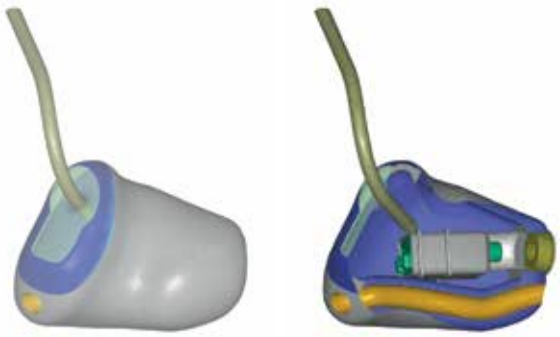
Cons:

- Must be returned to Phonak for receiver replacement

Anatomy of a SlimTip



Anatomy of a cShell



Wax protection system options

Cerumen can build up inside a hearing instrument, causing the amplification to seem weak or nonexistent. Phonak offers several wax guards to help protect your client's hearing instruments.

Cerustop wax filter	HF3 wax filter	HF4 wax filter	Extended receiver tube
A replaceable wax protection system with a white basket that helps prevent wax from reaching the receiver.	A replaceable wax protection system with a large diameter, fine mesh filter to prevent wax from entering the receiver.	A replaceable wax protection system with a fine mesh filter to prevent wax from entering the receiver (the same as HF3 but smaller).	The last resort for extremely narrow canals, where other filters do not fit. The sound tube extends from the tip, preventing cerumen entry by keeping the outlet away from the canal wall.
Pros: • Small—fits most ears including narrow canals • Works with all receiver power levels	**Pros:** • Fine mesh prevents wax from entering receiver • Large diameter for longer filter change intervals • Durable attachment to hearing instrument • Colour coded blue and red for left and right identification, respectively	**Pros:** • Small diameter fits most ears • Durable attachment to hearing instrument • Colour coded blue and red for left and right identification, respectively	**Pros:** • Smallest option – fits when nothing else will
Cons: • Small cavity for trapping cerumen can block quickly • Less durable than other solutions	**Cons:** • Requires a fairly large / wide canal to fit	**Cons:** • Not compatible with SP or UP receivers	**Cons:** • Limited protection • No filter to change

What about moisture?

To maximise the life and performance of hearing instruments, the use of an active drying box, such as the 'Phonak D-Dry' is recommended.[1] This helps to remove damaging moisture and reduces the accumulation of germs with the use of a UV-C lamp.

1. Richards, D., Martin, R.L., "For healthier hearing aids and happier patients, use a warm-air drying system". The Hearing Journal. 59,2 2006.

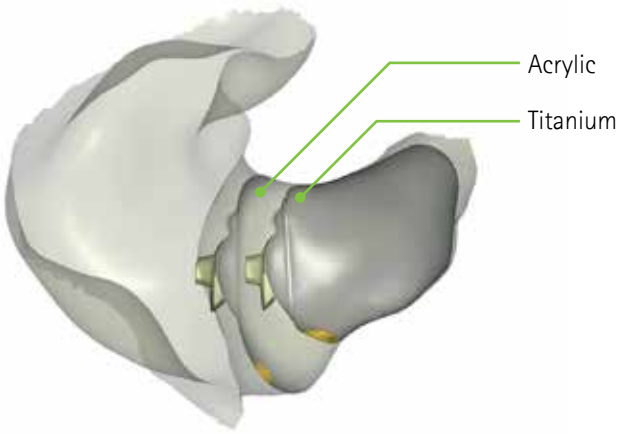
Earmould & shell material options

When selecting a material for your client's custom product, there are a number of factors to consider. These include: hearing loss, ear texture, age, dexterity, possible allergies/ reactions to materials, colour options and whether you may need to modify a mould in clinic.

Name	Characteristics	Advantages
Acrylic	Hard	• Easy to modify in clinic • Comfortable • Easier to insert in ears with soft skin texture • Recommended for mild to severe hearing losses
Titanium	Hard	• Ultimate durability • Suitable for sensitive ears that react to other materials • Reduces device size by allowing thinner shell walls
Silicone S70	Semi-soft	• Firm, semi-flexible • Recommended for mild to profound hearing losses • Available in specialty colours including glitter • Safer in situations when physical trauma likely (e.g. Sports)
Silicone S40	Soft	• Soft, flexible material with superior sealing properties • Recommended for severe to profound hearing losses • Available in specialty colours • Safer in situations when physical trauma likely (e.g. Sports)
Silicone S25	Very soft	• Softest, flexible material with superior sealing properties • Recommended for severe to profound hearing losses and corner audiograms

Titanium advantage: Lower profile

The most compelling reason to choose a titanium shell is for a more cosmetically appealing hearing instrument. This example shows a challenging ear with a narrow canal entrance. With a traditional acrylic shell, the battery does not fit into the canal, resulting in a higher profile than ideal. By measuring with the Titanium Fit Guide and changing to a titanium shell, we are able to provide an additional 2.5mm[1] of depth, making the device significantly less visible.



1. Stewart, E., Bishop, R., & Loyola, N. (2018) Phonak Field Study News: Titanium FitGuide – helping more than 50% of people get an even more discreet Virto B-Titanium. June, 2018.

Ease of use options

Removal filament

A nylon cord attached to the device to assist with removal of the instrument.

Removal filament extended

A removal filament that is 5mm longer than standard for easier grip/removal.

Removal post

A sturdy, robust post for easy insertion and removal—great for clients with limited dexterity.

Solid handle

A built in handle to assist with insertion and removal. Only available with 'full shell carved' & 'half shell carved' moulds.

Raised volume control

A cap is inserted on the volume control, making it easier to locate on the faceplate.

Colour dots

Large red and blue colour dots are placed on both instruments, serving as a visual indicator of right versus left, respectively.

Side indicators

L and R markings added to instruments to help identify left from right.

Cord holder set

A rubber cord, connected between ITEs or moulds to prevent loss. Includes a clip which can be attached to clothing. Loop handles required.

Custom shell retention options

Canal lock

Known by many names – concha lock, retention wing, canal hook, retention shoe. Increases retention by adding additional material in the anti-tragus and concha bowl area.

Skeleton lock

Additional retention gained in the helix/cymba region, effectively locking the shell in place between the cymba, tragus and antitragus.

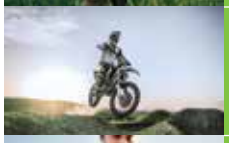
Phonak
Serenity Choice

Did you know that 70% of people exposed to loud noise never or seldom wear hearing protection? Part of Phonak's Well-Hearing is Well-being philosophy is to provide solutions that treat hearing loss and solutions that prevent it.

Phonak Serenity Choice™ is the high-end hearing protection that offers a ready-to-wear hearing protection solution.

Phonak Serenity Choice™ **Plus** is custom-made hearing protection, which offers the same high-quality filter technology as Phonak Serenity Choice with the additional benefits of a custom-made fit. For both generic and custom hearing protection, a range of filters is available to ensure a solution for all environments.

Phonak
Custom hearing protection

		Filter	Level of Protection	Full Shell	Canal Mould
	Music		Low KM15	n/a	Silicon
			Medium KM20		Acrylic
			High KM25		
	Shooting & Hunting		High (impulse) KIM9	Silicon	Silicon
				Acrylic	Acrylic
	Motorsport		Medium KI20	n/a	Silicon
			High KI25		
	Work		Medium KI20	Silicon	Silicon & Acrylic
			High KI25	Acrylic	
			Max KI30		
	Comfort		Low KI10	n/a	Silicon
	Sleep	n/a	High No filter, sealed	n/a	Silicon
	Fly		Low KM16	Silicon & Acrylic	Silicon & Acrylic
	Swim		Water KR5	Silicon	n/a

Notes

life is on

At Phonak, we believe that well-hearing equates to well-being and is essential to living life to the fullest. For more than 70 years, we have remained passionate about creating a world where 'life is on' for everyone. Our innovative hearing solutions are designed for people of all ages and all degrees of hearing loss, to connect socially, thrive mentally and improve their well-being.

www.phonak.com.au

sonova
HEAR THE WORLD

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