

Neuro 2 – Where sound meets design



Your journey into hearing starts here

Choosing a cochlear implant solution means opening up to a world of sound. With the Neuro 2 sound processor, you can feel confident that you or your loved one are making the right choice on this important journey. Find out why on the following pages and visit Oticon Medical online or on social media to meet users and read their stories.



Indicates an Oticon Medical unique technology or accessory in the CI industry at the time of this publication





Hearing
confidence
for all stages
of life

Contents

Where sound meets design 4

Easy to use and rely on

Join in conversations. Enjoy an active social life 6

Stay active. Live life on the go 8

Get connected. Stream clear sound from all your devices 10

Feel confident. Turn it on and relax 12

Making sense of sound

BrainHearing™ 14

Sound processing technologies that support BrainHearing™ 16

Because parents want the best for their child 18

The perfect partner with Oticon hearing aids 20

An important choice

Prepared to face the future 22

Passionate about your hearing 24

Neuro 2 at a glance 26

Neuro 2 – Where sound meets design

As soon as you see and feel Neuro 2 – the premium sound processor from Oticon Medical – you will appreciate the attention to detail that has gone into its **design**. Its carefully-crafted features combine high quality engineering with a strong focus on **sound quality** and usability. That's how Neuro 2 gives you **hearing confidence** all day, every day.

- Extra slim where it matters

- Designed for all-day comfort



- Attention to detail

- Ultra-strong, discreet cable

Actual size



Scan to see the Neuro 2 story



**Neuro 2 is the smallest
Behind-The-Ear sound processor – ever**



**reddot award 2017
winner**

The prestigious international Red Dot Design Award is given for excellence in design and quality.



The German Design Award is given to products that set themselves apart thanks to their ground-breaking design quality.

Join in conversations

Enjoy an active social life

Conversations at work, spending time with friends, playing sports – these are just some of the many listening situations you may face each day. Supported by Neuro 2, you can take part with confidence.



Excellent
speech
understanding¹
in difficult
situations

Automatically enhances speech

Daily life contains a variety of listening situations. Neuro 2 automatically adapts to these changing sound environments so you can keep your focus on understanding speech – even in environments where different noises and sounds compete for your attention. Wherever you go, Neuro 2 aims to make it easier to have conversations, without you having to adjust your sound processor.



Designed to
preserve
95%
of speech²

Stay active

Live life on the go

Whatever you enjoy doing, Neuro 2 is designed to help you do it. From swimming in the pool to fitness classes or taking part in sports, Neuro 2 comes with a variety of accessories to keep it securely in place so that you can do what you love.



**Accessories mentioned here are related to an upcoming product release. Availability is subject to a CE marking, local registration and commercial availability. More information on local availability can be obtained from your local Oticon Medical office.*



Dive
in with
confidence



Fully waterproof in seconds

If you want to get completely wet, use the Swim Kit* for full waterproof protection. Just slip the elegant water protection sleeve onto your Neuro 2 and you're ready to jump straight in. Children can use it to take part in swimming lessons and still hear the teacher, while parents can use it to have fun with their children in the water.

- Elegant and smart
- Use with any rechargeable battery
- Suitable for freshwater and seawater

Stays in place

Convenient accessories* are available for daily use, sport and play activities.

A collection of accessories for the hearing aid, each shown in a hexagonal frame. The items include: "Ear plug retention" (a circular plug), "Thin safety line" (a thin cord), "Clip" (a small black clip), and "Safety line" (a thicker black cord). The Oticon Medical logo is also present, with the word "UNIQUE" in a red box. A small inset photo shows a man and a woman in outdoor gear.



Get connected

Stream clear sound from all your devices

Communication today means more than face-to-face conversations. That's why the Neuro 2 lets you wirelessly connect to all your electronic devices using the Oticon Medical Streamer*. Connect and enjoy direct sound from your favourite TV programmes, on the phone, for video chats on the computer, listening to music and much, much more.



**Accessories mentioned here are related to an upcoming product release. Availability is subject to a CE marking, local registration and commercial availability. More information on local availability can be obtained from your local Oticon Medical office.*

Apple, the Apple logo, iPhone, iPad, and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc. Android, Google Play, and the Google Play logo are trademarks of Google Inc.



Stream sound

Simply push a button on the intuitive Oticon Medical Streamer* and you can stream sound to your Neuro 2 from a wide variety of communication and entertainment devices – including 2.4 GHz technology and Bluetooth-enabled devices, looped environments and FM systems. This aims to give you excellent sound quality that doesn't compromise battery life.



Remote



Mobile



TV



Microphone



Computer



Phone



Music



MiniJack



Tele loop



FM



App

Intuitive control

Simply use the dual push button to select programs, change the volume or mute sound.

To remotely control your Neuro 2, or the sound coming from electronic devices, just use the Oticon Medical Streamer* or the free ConnectLine App* that is compatible with both iPhone® and Android™ phones.

Feel confident

Turn it on and relax

Active lifestyles require reliable sound processors. Despite its small size and weight of just nine grams*, Neuro 2 can easily withstand daily wear and tear because every detail has been carefully considered, designed and tested.

Quality you can rely on

Neuro 2 has undergone the most extensive testing programs so it complies with both the highest safety and reliability standards. Whatever the weather or situation, Neuro 2 will deliver the hearing clarity you rely on.



In fact, Neuro 2 has achieved an impressive IP68 rating – the highest classification in cochlear implants against water and dust. A durable, repellent coating – interior and exterior – effectively protects the sensitive electronic board and its components so you don't need to worry if you are caught in a rain shower, accidentally splashed, or just briefly forget to take your Neuro 2 off before turning on the shower**.

Neuro sound processors undergo over 50 different reliability tests



Water resistance
– 1 metre for 30 min.



Drop test – 2 m



Sweat, moisture and
humidity test



Extreme temperatures
– from -40°C to +85°C



Antenna cable pull
– 35 N (3.5 kg)



Scan to see how we test the
Neuro 2 sound processor.

* with small rechargeable battery module included

** If you want to get completely wet, always use the Swim Kit for full waterproof protection.

The difference is in the details

The highest level of craftsmanship has gone into each and every detail of Neuro 2. It is designed to be thin and small but at the same time as robust and reliable as possible.



Voice-activated system check
Parents and caregivers can easily test if the system is working



Protective barrier around microphones



Connectors designed in premium quality material



Ultra-thin reinforced* antenna cable
Just pull and feel the robustness



Large rechargeable Li-Ion battery module

Small rechargeable Li-Ion battery module

Cartridge for 2 disposable Zinc Air batteries



Battery charger

Outstanding battery life

With the small battery, you can enjoy complete discretion and enough power for a full day at work or school. Or use disposable batteries, and you'll typically have over three days' power. Furthermore, as all batteries have been tested in real-life conditions with constant speech signals**, you can be sure that they perform exactly as you'd expect.

* The antenna cable is reinforced with Aramid fibre (Technora™ – a next generation 'Kevlar™'), a proven, highly resistant material, commonly used in bulletproof jackets.

** ANSI/AAMI CI86:2017 Cochlear implant systems: Requirements for safety, functional verification, labelling and reliability reporting

BrainHearing™

Making sense of sound

Demanding situations with conversations and background noise mean your brain has to work harder, which can leave you feeling drained.

BrainHearing™ is about a fundamental understanding of how hearing works – and how the brain makes sense of sound. Using technologies that support BrainHearing™, Neuro 2 aims to minimise your listening effort^{3, 4, 5} and free up your mental energy⁶ for enjoying life.





Why reducing listening effort is so important

Each day you experience a wide variety of listening situations that require different amounts of listening effort. For example, talking to a friend in a quiet room is easier compared to conversations on a noisy street or in a crowded restaurant.

When you need to invest more energy in listening, it places an extra strain on the brain. This can leave you feeling tired and worn out. The reverse is also true – the less listening effort, the better you can understand, participate and engage in social situations.

That's why your cochlear implant system has to support the way your brain naturally processes and makes sense of sound, giving it sound information that is as accurate and detailed as possible. This is what takes the strain out of listening. We call it BrainHearing™.



Free up
mental energy
and live
life to the full



Sound processing technologies that support BrainHearing™

Neuro 2 is designed to free up your mental energy by providing the clearest, most undistorted sound. Using high-performing microphones, it lets you enjoy the widest range of sounds – from soft to loud. It is built on the advanced Inium Sense chip platform from Oticon, which enables automatic features and innovative sound processing – also called Coordinated Adaptive Processing. This aims to optimise speech understanding^{7, 8, 9} and reduce listening effort^{3, 4, 5} in all sound environments.



**Better
hearing
begins
here**

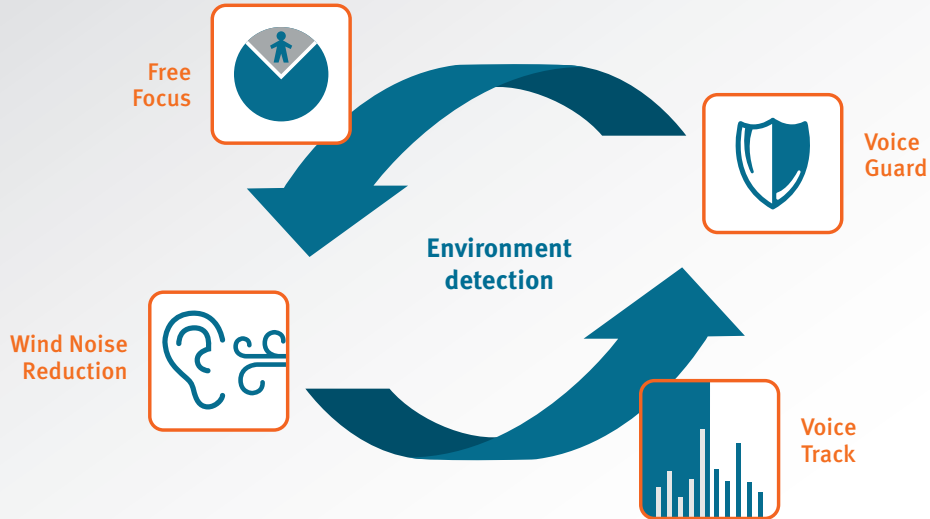




Coordinated Adaptive Processing



Automatically delivers the perfect balance of the different sound processing technologies that support BrainHearing™. Whatever the environment, Neuro 2 draws on the technology needed in that situation to enhance listening and speech understanding.



Free Focus – Directionality

Automatically switches between different modes when your listening environment changes to keep the focus on what people are saying. Additionally, the **Speech Omni** – light directional mode – aims at improving speech understanding in low-noise environments where you typically spend most time.



Wind Noise Reduction

Automatically reduces wind noise to protect speech audibility and comfort outdoors.



Voice Guard – Speech enhancement

Keeps speech guarded from distortion and at the right level – soft voices are audible and loud voices are comfortable to hear.



Voice Track – Noise reduction

Shields against unwanted noise to make conversations easier and the listening experience more comfortable.

Clinical evidence supports BrainHearing™

Clinical data¹ indicates that Neuro 2 provides excellent speech understanding in both optimal and difficult situations, such as with background noise and following a long period of hearing deprivation.

Because parents want the best for their child

For many children all over the world, a cochlear implant hearing solution has opened up a world of speech understanding, language and learning – helping them thrive at school, develop friendships and build relationships. By stimulating the brain at a young age when it is most receptive, you can give your child the best conditions for reaching his or her full potential.



**Accessories mentioned here are related to an upcoming product release. Availability is subject to a CE marking, local registration and commercial availability. More information on local availability can be obtained from your local Oticon Medical office.*



Supports classroom learning

Neuro 2 aims to provide a solid foundation for language development. With access to clear sound signals, children spend less effort trying to hear and have more energy left to learn.

Using the Oticon Medical Streamer*, Neuro 2 can be used with the ConnectLine microphone or an FM system to transmit the teacher's voice into the sound processor.



For school, for friends, for fun



Secure and robust

A variety of retention* solutions available



Tamper-proof design

Prevents children accessing smaller components, such as the battery



Program lock

Stops your child from accidentally altering the settings



Programmable indicator light

Shows parents, teachers, and caregivers the operating status



Voice-activated system check

Easily tests if the system is working



Full water protection

Use the Swim Kit* to protect the sound processor in water



Comfortable all day

Different sized ear hooks for a comfortable fit



Clip for wearing on clothing

A convenient alternative wearing* solution

child
friendly
hearing
care

Paediatric technology and design that meets your child's individual needs as they journey towards adulthood.

The perfect partner with Oticon hearing aids

Hearing with both ears is important for sound quality, spatial perception and speech understanding. If you use an Oticon hearing aid with your Neuro 2, you can enjoy a perfect match of sound processing technologies made to give you hearing synergy and a truly balanced listening experience.



** Accessories mentioned here are related to an upcoming product release. Availability is subject to a CE marking, local registration and commercial availability. More information on local availability can be obtained from your local Oticon Medical office.*

*** Compatible with iPhone® and Android™*



Balanced sound experience

With an Oticon Dynamo or Oticon Sensei SP hearing aid, you can enjoy the full benefits of Oticon technology with Neuro 2. Both devices use the Inium Sense platform and environment detection system to work in synchrony on both ears for the most balanced hearing.

Wirelessly connected

With an Oticon hearing aid and Neuro 2, you can use the same accessories with both devices. For example, you can use the Oticon Medical Streamer* and ConnectLine App** to control the sound from all of your electronic devices and send the sound to both your Oticon hearing aid and your Neuro 2 seamlessly and efficiently.



Power Pink



Aquamarine



Pure White



Silver



Silver Grey



Steel Grey



Diamond Black



Chroma Beige



Terracotta



Chestnut Brown

Prepared to face the future

The past decades have seen tremendous technological advancements in the hearing health care industry and the pace of development shows no signs of slowing down. With the proven Neuro Zti implant, you don't have to worry about what the future holds. Because when new technology becomes available, you can just upgrade your sound processor and continue to enjoy great sound.



Future-ready

Enables the optimal hearing experience now and in the future



Ultra-thin and compact design*

Small size allows placement closer to the ear for greater discretion



Reliable implant

State-of-the-art materials and compact design for high impact resistance



Proven¹⁰ atraumatic^{11,12} electrode arrays

Electrode array variants that adapt to different surgical needs and cochleas



Designed for simple and safe surgery*

Proven^{13, 14, 15, 16} and patented screw fixation system for less invasive surgery



MRI peace of mind*

Unique case material for safe MRI with standard strength of 1.5 Tesla, and 3.0 Tesla when the magnet is removed



Supporting tools for the audiologist

All major implant measurements – including Neuro ECAP 2.0 – available for audiologists to monitor and support fittings



**Oticon Medical unique features include our ultra-thin and compact design, the screw fixation system and the unique case material for safe MRI.*





Passionate about your hearing



“ At Oticon Medical, we put the long-term needs of users first and strive to ensure that everyone can enjoy the precious gift of hearing. That's why if you decide to choose a Neuro 2 sound processor, you'll also be choosing a company with a strong tradition of listening to users and delivering the highest standards of care to everyone with hearing loss. ”

Jes Olsen, CEO Oticon Medical

One of the world's leading hearing health care companies

When you choose a cochlear implant from Oticon Medical, you choose a hearing partner for life. With three decades of expertise in cochlear implants, we have provided cochlear implant solutions and ongoing support to thousands of people around the world.

As part of one of the world's largest groups of hearing health care companies, Oticon Medical shares close links with Oticon. We draw on their technological expertise and combine it with our in-depth understanding of the challenges patients encounter in their day-to-day lives. This is what enables us to develop implantable hearing solutions that improve quality of life, now and in the future.

Improving hearing care everywhere

Today the majority shareholder in our organisation is the Oticon Hearing Foundation. This organisation aims to improve hearing care for more people around the world through activities such as funding for charity projects that take hearing care to remote regions, as well as projects in the field of cochlear implants.



Follow us on social media to find out more about users' experiences with Oticon Medical cochlear implants.



Neuro 2 at a glance

Features

Design	Smallest Behind-The-Ear sound processor
	Ultra-slim where it matters
	Ultra-thin aramid reinforced antenna cable
	10 colours and a variety of decors
Sound processing	BrainHearing™ – Supports brain processes for better speech understanding and less listening effort
	Automatic features & Coordinated Adaptive Processing
	Dual microphones – Widest input dynamic range (83dB)
	Voice Guard – Made to preserve 95% of speech
Powering	Large Li-Ion rechargeable battery (200mAh) Small Li-Ion rechargeable battery (120mAh) 2 Disposable zinc air 675 batteries
	Outstanding battery life
Water resistance	IP68: the highest classification in cochlear implants against water and dust
	Fully waterproof in seconds with Swim Kit*
Usability	Easy volume, program and mute selection
	4 programs
	Programmable indicator light
	Auto off
	Voice-activated system check
Connectivity	Compatible with the widest variety of electronic devices (TV, computer, music, etc.) – including 2.4 GHz technologies and Bluetooth-enabled devices, looped environments and FM systems – via Oticon Medical Streamer* & Oticon ConnectLine accessories*
Remote control	Via Oticon Medical Streamer* & ConnectLine App* (iPhone and Android compatible)
Bimodal	Balanced hearing experience with Oticon Inium Sense based hearing aids
	Shared wireless accessories with Oticon Dynamo and Oticon Sensei SP
	Cosmetic fit with Oticon hearing aids
Reliability & safety	Robust design
	High quality materials
	Tamper-proof design for child safety
	Implant pairing to avoid sound processor mismatches
Retention	Comfortable hook
	Variety of retention* solutions
Implant compatibility	Neuro Zti and Digisonic [®] SP*



What's your Neuro 2 style?



Decor kits*
in various patterns



Customised clip-on caps*



Scan to find the Oticon Medical office closest to you.

*Accessories and Neuro 2 compatibility with the Digisonic® SP implants mentioned here are related to an upcoming product release. Availability is subject to a CE marking, local registration and commercial availability. More information on local availability can be obtained from your local Oticon Medical office.

References

1. Monocentric data collection performed at the MHH Hannover Medical School in Germany in 2016 by A. Büchner et al.
2. Segovia-Martinez, M., Gnansia, D. & Hoen, M. Coordinated Adaptive Processing in the Neuro Cochlear Implant System. Oticon Medical Whitepaper, 2016
3. Ng EH, Rudner M, Lunner T, Pedersen MS, Rönnerberg J. Effects of noise and working memory capacity on memory processing of speech for hearing-aid users. *Int J Audiol.* 2013 Jul;52(7):433-41. doi: 10.3109/14992027.2013.776181
4. Ng EH, Rudner M, Lunner T, Rönnerberg J. Noise reduction improves memory for target language speech in competing native but not foreign language speech. *Ear Hear.* 2015 Jan;36(1):82-91. doi: 10.1097/AUD.0000000000000080.
5. Wendt D, Hietkamp RK, Lunner T. Impact of Noise and Noise Reduction on Processing Effort: A Pupillometry Study. *Ear Hear.* 2017 Jun 20. doi: 10.1097/AUD.0000000000000454.
6. Pichora-Fuller MK, Kramer SE, Eckert MA, Edwards B, Hornsby BW, Humes LE, Lemke U, Lunner T, Matthen M, Mackersie CL, Naylor G, Phillips NA, Richter M, Rudner M, Sommers MS, Tremblay KL, Wingfield A. Hearing Impairment and Cognitive Energy: The Framework for Understanding Effortful Listening (FUEL). *Ear Hear.* 2016 Jul-Aug;37 Suppl 1:5S-27S. doi: 10.1097/AUD.0000000000000312.
7. Gatehouse, S., Naylor, G., & Elberling, C. (2003) Benefits from hearing aids in relation to the interaction between the user and the environment. *Int J Audiol, 42(Suppl. 1), S77–85.*
8. Weile & Littau, 2013. Free Focus. Technical Paper, Oticon.
9. Nilsson, 2013. Alta Core Features. White Paper, Oticon.
10. Bento, R.F., Danieli, F., Magalhães, A.T., Gnansia, D., Hoen, M. (2016). Residual Hearing Preservation with the EVO® Cochlear Implant Electrode Array: Preliminary Results. *Int Arch Otorhinolaryngol.* 2016 Oct; 20(4):353-358. Epub 2016 Feb 16. doi: 10.1055/s-0036-1572530.
11. Martins, G.S., Brito Neto, R.V., Tsuji, R.K., Gebrim, E.M. & Bento, R.F. (2015). Evaluation of Intracochlear Trauma Caused by Insertion of Cochlear Implant Electrode Arrays through Different Quadrants of the Round Window. *Biomed Res Int.* 2015;236364. Epub 2015 Jul 5. PMID: 26236719.
12. Nguyen, Y., Miroir, M., Kazmitcheff, G., Sutter, J., Bensedhoum, M., Ferrary, E., Sterkers, O. & Bozorg-Grayeli, A. (2012). Cochlear implant insertion forces in microdissected human cochlea to evaluate a prototype array. *Audiol Neurootol.* 17:290-8. PMID: 22653365.
13. Vanlommel, M., Lipski, S. & Dolhen, P. (2014). Minimally invasive pocket technique for the implantation of Neurelec Digisonic SP cochlear implant. *Eur Arch Otorhinolaryngol.* 271:913-8. PMID: 23575934..
14. Rădulescu, L., Cozma, S., Niemczyk, C., Guevara, N., Gahide, I., Economides, J., Lavieille, J.P., Meller, R., Bébéar, J.P., Radafy, E., Bordure, P., Djennaoui, D. & Truy, E. (2013). Multicenter evaluation of Neurelec Digisonic® SP cochlear implant reliability. *Eur Arch Otorhinolaryngol.* 270:1507-12. PMID: 23161275.
15. Carvalho, G.M., Guimarães, A.C., Danieli, F., Onuki, L.C., Paschoal, J.R., Bianchini, W.A. & Castilho, A.M. (2012). Evaluation of the Digisonic® SP cochlear implant: patient outcomes and fixation system with titanium screws. *Braz J Otorhinolaryngol.* 78:56-62. PMID: 23306569.
16. Guevara N., Sterkers O., Bébéar J.P., Meller R., Magnan J., Mosnier I., Amstutz I., Lerosey Y., Triglia J.M., Roman S., Gahide I. Multicenter Evaluation of the Digisonic SP Cochlear Implant Fixation System with Titanium Screws in 156 patients. *Ann Otol Rhinol Laryngol.* 2010 August; 119: 501-5.



Because sound matters

Oticon Medical is a global company in implantable hearing solutions, dedicated to bringing the magical world of sound to people at every stage of life. As a member of one of the world's largest groups of hearing healthcare companies, we share a close link with Oticon and direct access to the latest advancements in hearing research and technologies. Our competencies span more than a century of innovations in sound processing and decades of pioneering experience in hearing implant technology.

By working collaboratively with patients, physicians and hearing care professionals, we ensure that every solution we create is designed with user needs in mind. We share an unwavering commitment to provide innovative solutions and support that enhance quality of life for people wherever life may take them. Because we know how much sound matters.



Oticon Medical

 NEURELEC
2720 Chemin Saint-Bernard
06220 Vallauris
France
TEL: +33 (0) 4 93 95 18 18 – FAX: + 33 (0) 4 93 95 38 01
info@oticonmedical.com