



Information for hearing healthcare providers 2020/2021



high level hearing

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1 The hearing aid batteries from power one



Production, research & development

power one hearing aid batteries are manufactured in Ellwangen, Germany, in the world's largest and most modern production plant for environmentally-friendly hearing aid batteries.

The production facility with state-of-the-art technology guarantees top quality and environmentally-compatible production.

The precision and reliability of our fully automated production facility is the key for the top quality of every single cell.

Each cell passes through multiple quality assurance stages and is tested in terms of height, voltage and internal resistance.

power one stands for

- New, innovative battery and manufacturing technology
- Best product quality
- Sustainable environmental protection
- Unique full assortment of hearing aid batteries

power one production with certified quality

- ISO 9001 – Quality Management System for processes with guaranteed quality – Made in Germany
- ISO 14001 – Environmental Management System for production that is guaranteed to be sustainable and environmentally friendly
- ISO 50001 – Energy Management System for maximum energy efficiency and sustainability
- ISO 13485 – Quality Management System for medical devices



Product assortment

power one is the only hearing aid battery manufacturer that produces the full assortment:

- Hearing aid batteries with zinc air technology
- Hearing aid batteries for implants with zinc air technology
- Rechargeable hearing aid batteries with NiMH technology
- Rechargeable hearing aid batteries with Lithium-Ion technology



Rechargeable hearing aid batteries, Li-Ion:

Customized product, produced to meet the needs of the respective hearing aid manufacturer.

Packaging

- Comfort Pack**
- The practical rotary dispenser facilitates easy, optimal battery removal
 - The quality seal guarantees maximum product protection
 - The recloseable strap ensures safe storage
 - Highly visible colour coding
 - Environmentally-friendly materials made of PET and cardboard

Tabs The extra long tabs allow comfortable insertion of the zinc air cells in the hearing aids.



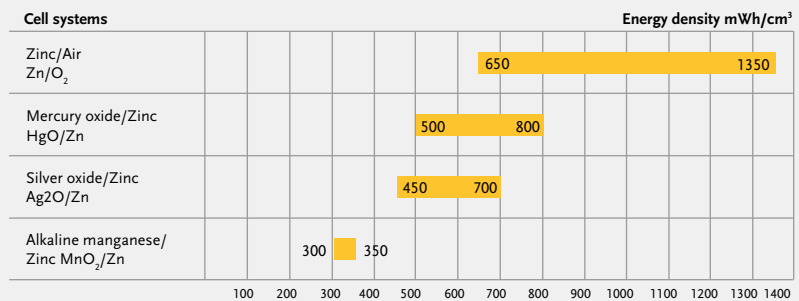
Quality seal The quality seal guarantees that the pack has not been opened yet.



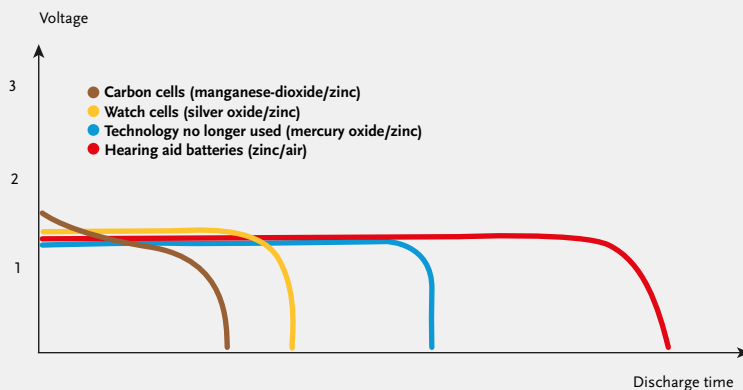
2 Battery systems

The systems compared

The energy density of primary batteries Hearing aid batteries with zinc air technology have the highest energy density.



Typical discharge curves of primary batteries Zinc air hearing aid batteries are characterised by a long battery life and stable voltage fluctuation.



Cell comparisons under similar discharge conditions

Primary batteries

Advantages of zinc air batteries

- Zinc air batteries have a smaller cathode than conventional alkaline button cells – oxygen from the air is used as the reaction partner.
- Zinc air batteries have higher capacity – with the same cell volume as conventional alkaline button cells.
- Zinc air batteries have a very high energy density – compared to conventional alkaline button cells.

power one **EVOLUTION**

The generation of hearing aid batteries with the highest energy density

Hearing aid batteries with higher energy density are the result of consistent research work and ongoing development.

Our expertise here is based on the synergy of wide-ranging material research, many years of experience in cell development and our own manufacturing plant technology.

Our **power one** EVOLUTION is based on TFT (Thin Foil Technology).

It has a very high energy density, more capacity than our well-established hearing aid batteries and therefore a longer battery life – by up to 15%*.



*Type p312

Secondary batteries



power one ACCU plus

power one ACCU plus are rechargeable hearing aid batteries made by power one.

power one is the world's only manufacturer of rechargeable NiMH hearing aid batteries.



How long do rechargeable hearing aid batteries run for?

Our rechargeable hearing aid batteries are designed that one charge will last about one day of use depending on hearing aid and size of the rechargeable battery. The hearing aid is recharged overnight and is ready for use the next day.

The power one hearing aid rechargeable batteries currently available on the market are based on NiMH technology. The advantage here is that the zinc air battery voltage and the NiMH rechargeable battery voltage are in the same range. Therefore, a zinc air cell is 1:1 interchangeable

with a NiMH rechargeable battery. The battery life of a battery is greatly influenced by the hearing aid type and the usage, so consideration must be given to which technology is used when. A rechargeable NiMH battery has 1/10 of the capacity of the corresponding zinc air battery. Accordingly, the use of a rechargeable battery only makes sense when the hearing aid runs at least 10 days with a zinc air battery.

Note

Please only charge our rechargeable batteries, such as the power one ACCU plus, in the power one battery chargers intended for this purpose.



The highest performing and reliable power one batteries for the specific energy solutions of hearing aid manufacturers

power one Li-Ion accus

power one Lithium-Ion rechargeable batteries for hearing aids have been developed by focusing on the customer requirements of today and tomorrow. Their design combines top performance and maximum safety.

Long experience in research and development is the reason for the high standard of quality achieved by our Made in Germany lithium battery technology.

Key features

- Robust and reliable cell format
- Innovative electrode design for maximum energy density
- Optimised for hearing aid use, where space is limited
- Satisfies the performance requirements of modern hearing aids and designed for long, stable usage
- Manufactured under strict quality control
- Manufactured in precisely defined production processes
- Quality Made in Germany

First generation:
NiMH 140 Wh/l

New generation:
Li-Ion 340 Wh/l



Energy density of the Type 13 NiMH hearing aid battery compared to a Lithium-Ion cell of the same size

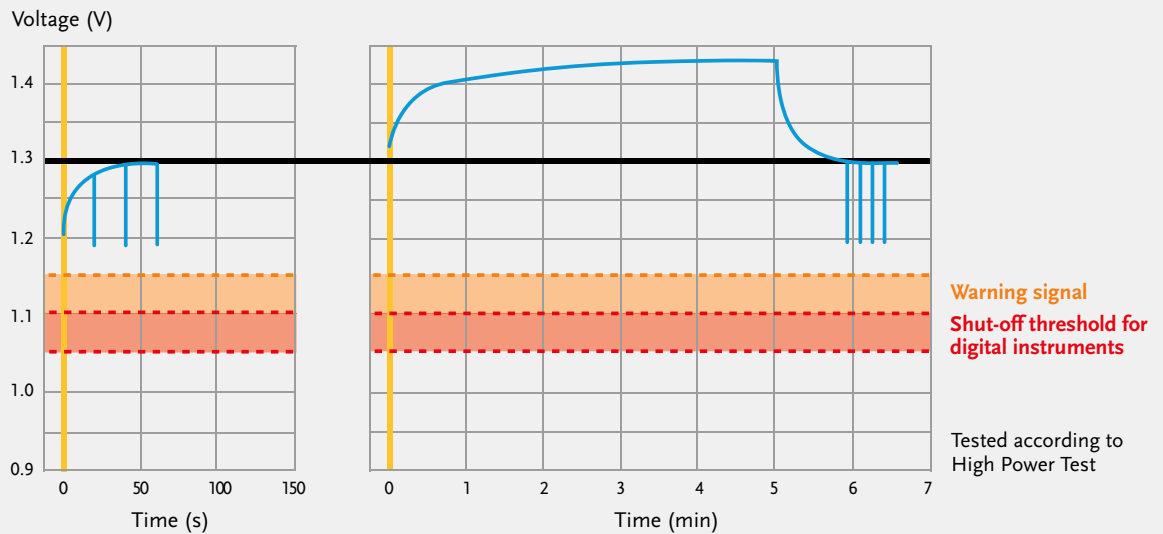
3 Zinc air hearing aid batteries

Function

Zinc air batteries have an anode made of zinc powder, the cathode is formed from atmospheric oxygen, the electrolyte is lye and a metal oxide serves as catalyst. The oxidation of zinc with oxygen releases usable energy.

The oxygen is supplied through small air holes that are sealed with tabs until used. Oxidation starts as soon as the air holes are opened and oxygen is supplied; the cell is activated immediately.

Activation time



A few seconds between activation and use in the hearing aid

A few minutes between activation and use in the hearing aid

Final voltage level is identical

Technical construction

power one WIRELESS approved



i

Why is the capacity of hearing aid batteries limited? And are hearing aid batteries with higher performance even conceivable?

The cross section through a zinc air cell shows clearly that the cathode is very thin and compact. Thus, the anode with a zinc mixture occupies most of the total volume in a zinc air battery.

The bigger the zinc quantity in the anode, the higher is the capacity. The possible zinc quantity is determined by the

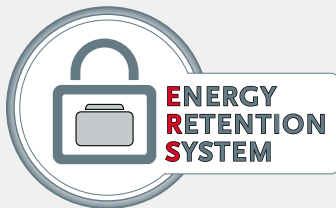
inner volume of the cell. This inner volume of the cell depends on the cell size. Accordingly, a smaller-sized cell contains less zinc and can therefore supply less energy than larger cell types.

The possibility of increasing the inner volume can be attained by using thinner casing parts. New innovative manufacturing technologies at **power one** make it possible: the proof is the **power one EVOLUTION**, which has up to 15 % more capacity.

Performance

- Increased hearing instrument functionality means increased power consumption.
- **power one** batteries are designed in such a way that they can maintain a high voltage level because they have an outstanding load capacity.

Why stable and high voltage is important for the hearing aid battery:
A constantly high voltage level prevents the hearing aid from sending a warning signal or switching one off.



The utilisation of innovative production technologies has resulted in improved performance under various climatic conditions. **power one** hearing aid batteries continue to work safely and reliably even after long periods of storage, thanks to the unique ERS (Energy Retention System).



Requirements

What hearing aids and hearing aid batteries are capable of today:

Today's hearing aids have many additional, powerful functions that require a lot of power. Based on this, a new IEC standard was defined that demands, among other things, 15 minutes of non-stop "streaming" for types 13 and 312 without the hearing aid stopping.

The efficient **power one** WIRELESS *approved* hearing aid batteries meet these requirements.



Various factors influence the service life of zinc air hearing aid batteries

Usage For a hearing aid battery, battery life depends on the following:

- Daily usage
- Hearing aid settings
 - Configuration
 - Properties
 - Volume
 - Streaming functions

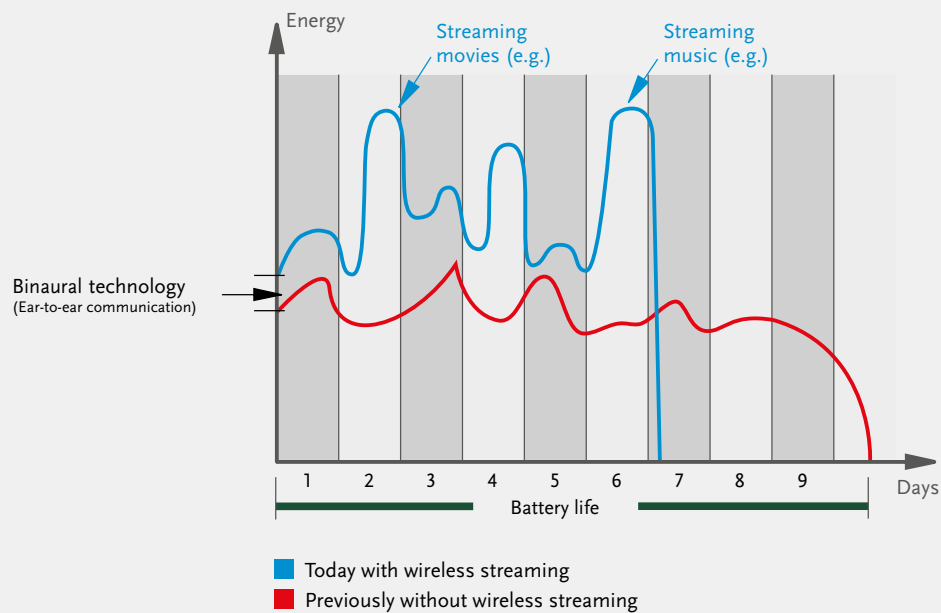
Devices now offered by hearing aid manufacturers continue to add functions that improve the wearer's interaction with the environment:

- Ear-to-ear TV communication
- Music or phone
- Tinnitus modes
- Controls on modern hearing aids adjust the device to changing environmental conditions.

What hearing aids and their batteries are now capable of



Usage of hearing aid functions Modern hearing aids consume more energy than previous generations of devices. This means shorter running life time for the battery.



The image clearly shows that hearing aids with wireless streaming require a lot more energy than hearing aids have previously needed.

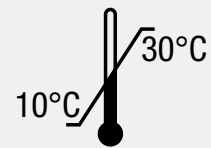
Environmental factors

Climatic factors such as

- ▶ altitude (> 60%) or low humidity (< 30%).
- ▶ heat (> 54°C) or cold (< 10°C) shorten the service life of batteries.
- ▶ Sweating and a dusty environment also affect on battery life.
- ▶ As altitude increases, the oxygen concentration in the air decreases. The result can be a reduced voltage level and capacity.

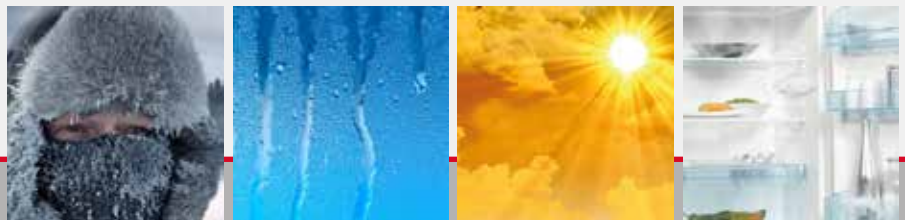


Correct storage: Hearing aid batteries should be stored at a temperature of 10–30°C in a dry place protected from direct sunlight. In the long-term, we recommend storage at a room temperature of 20–25°C.



The following factors shorten battery life:

- ▶ General temperatures under 10°C
- ▶ Cold environments like refrigerators
- ▶ Exposure to direct sunlight (e.g. in a car)
- ▶ High relative humidity (e.g. in a bathroom)



Correct handling

1. Always remove the battery from the hearing aid when empty. If you do not, a deep discharge state can occur and the battery may leak.
2. Remove batteries before the hearing aid is placed in the drying box overnight.
3. Never let hearing aid batteries come into contact with metallic objects, as this can result in a short circuit.
4. Hearing aid batteries are active after the tab has been removed. Reattaching the tab does not have an affect of extending battery life.
5. Keep batteries out of the reach of children.

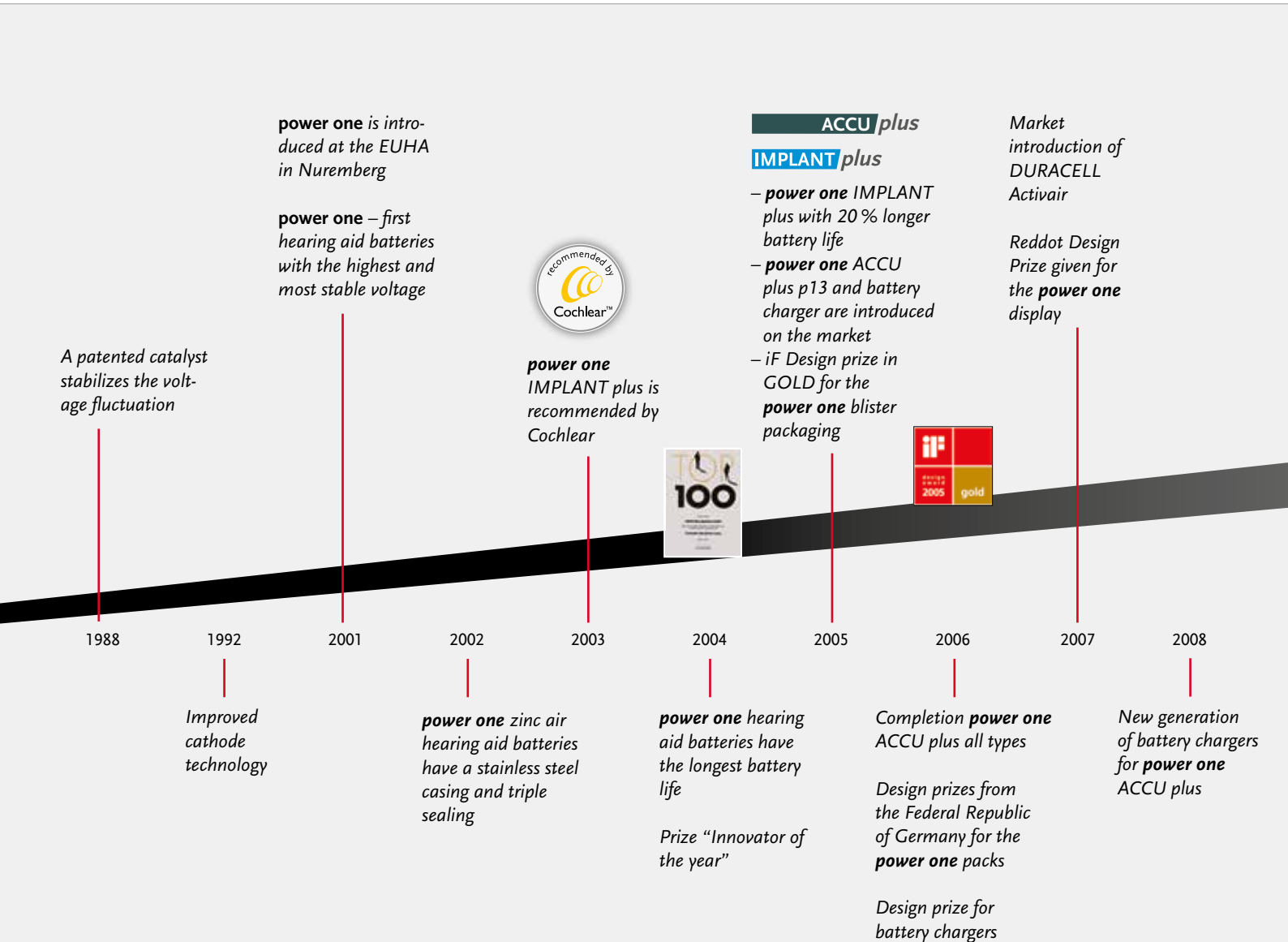


Tip: Always store or transport your hearing aid batteries in the packaging provided. One or two batteries can also be stored and transported by using the practical **power one** storage box.



4 History of the development of power one

Innovations



Certification ISO 50001, energy management systems



DURACELL®
ACTIVAIR®

2011

MERCURY-FREE

Market introduction of **power one** MERCURY-FREE

New factory for **power one** hearing aid batteries

2012



High-performance hearing aid batteries for implants

power one MERCURY-FREE wireless approved

2013

Introduction of the **power one** App



2014

The first **power one** batteries with Lithium-Ion technology



2015/2016

power one MERCURY-FREE with ERS (Energy Retention System)



Certification ISO 13485 quality management systems for medical products

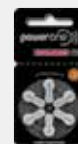


2017



TEST WINNER "Stiftung Warentest" consumer survey

2018



Market launch of **power one** "EVOLUTION"

2019

5 FAQ – frequently asked questions

Why do zinc air hearing aid batteries have a tab?

The tab seals the air holes of the hearing aid battery. As soon as the tab is removed, it takes about ten seconds for the hearing aid battery to be activated and the battery compartment of the hearing aid can be closed. Remove the tab only shortly before you insert the battery in the hearing aid.

What happens if a hearing aid battery discharges completely?

A hearing aid battery can leak if it discharges completely. This can happen if the discharged battery is left in the hearing aid. When the hearing aid is not used, it is **important** to remove the battery!

What can I do if a hearing aid battery is swallowed?

Both new and used batteries should by all means be kept out of the reach of children. If your child nonetheless swallows a battery, take him immediately to the physician.



What happens if my hearing aid battery makes contact with metallic objects?

If there is contact with metallic objects, a short circuit could occur in the hearing aid battery and it will cease to function.

How and where do I dispose of my used batteries?

Used batteries do not belong in the household waste. The consumer is obligated to take the batteries back to the point of sale or another collection point (if available). The material from used batteries can be recycled.

What do I have to pay attention to if I use my hearing aid with batteries while travelling by plane?

The function of hearing aids and hearing aid batteries is not affected by airport screenings or an airplane flying at cruising altitude.

Can I leave my hearing aid batteries in the hearing aid if I store it overnight in the dry box?

There is humidity in a zinc air cell, for instance electrolyte. If the battery dries up, it loses its functionality. Therefore, remove the battery before placing the hearing aid in the dry box.





power one app



Battery guide

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power one hearing aid batteries: Power



p13 WIRELESS *approved*
Capacity 300 mAh



p312 WIRELESS
Capacity 170



Scan the code above or visit
<http://apps.who.int/poisoncentres/>

Hearing aid users rely on the premium quality of power one hearing aid batteries and benefit from the power one app

- › **Battery timer** – automatically calculates run times by entering the battery replacement time plus added reminder function.
- › **Audiologist search** – a map shows the closest supplier of **power one** hearing aid batteries.
- › **Order inquiries** – can be made by telephone or directly via e-mail with the registered audiologists.
- › **Reminder function** – for hearing aid batteries.
- › **Mirror function** – for example for inserting the hearing aid.
- › **Battery advisor** – the most important questions about the subject of batteries are explained to you and information about the various types of batteries is listed.
- › **QR and EAN Code Reader** – for easy scanning of your hearing aid battery. The integrated QR-code reader enables a quick search for the closest poison control centre.
- › **power one News** – in this section, we keep you updated on “what’s new”.



Download the free power one app.



**Marketing support for
customer retention**

POS materials

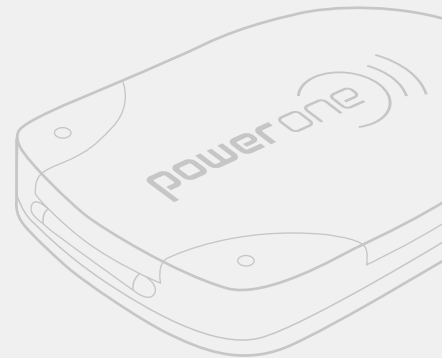
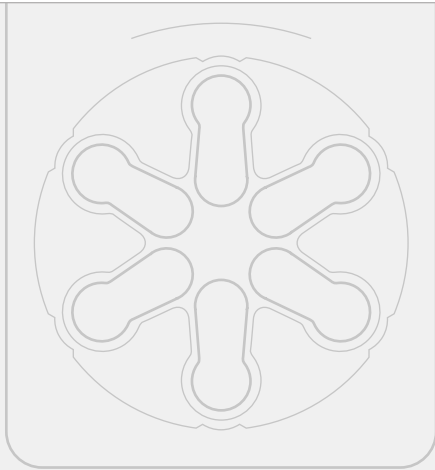
High quality, sales-supporting advertising materials, such as our Plexiglas display with 4 hooks for attractive and space saving product presentation.

Market experience

Current customer and market insights flow into the continuous development of our products and services to ensure maximum customer satisfaction.



Call us directly +49 79 61 921 790
or contact our sales partners.



**Distribution by worldwide leading manufacturers
and distributors of hearing aids**

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