

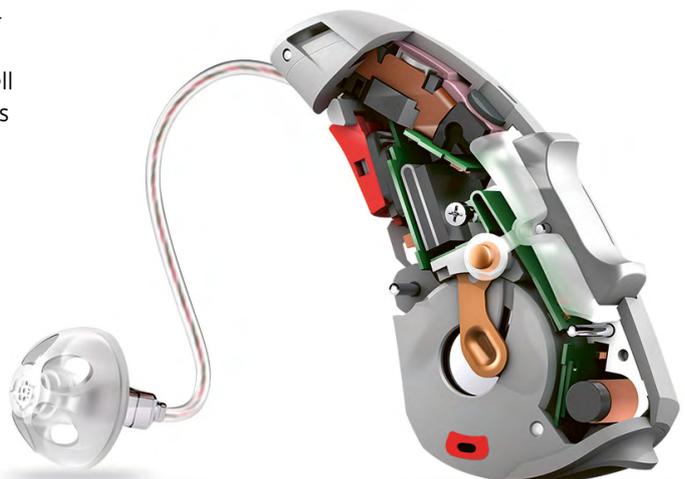


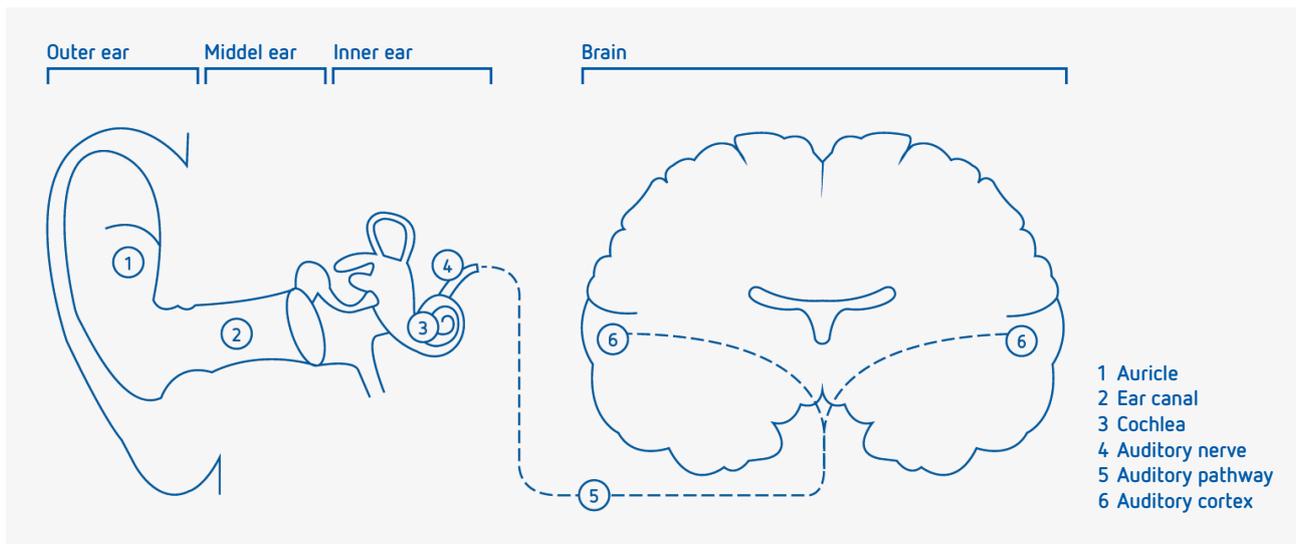
Partner of the hearing aid industry



Taking in the concert of the year with friends, enjoying a superb theater performance or simply talking about current issues in everyday life – thanks to modern hearing aids, people with hearing impairments can share in all those beautiful and emotional moments around them and get fully absorbed in them.

As a global outsourcing partner, the Cicor Group is responsible for the production of many electronic and plastic components for the global hearing aid industry. As a long-standing partner, Cicor offers one-stop engineering services, sophisticated PCBs, electronics assembly, toolmaking as well as plastic injection molding and box building. Cicor produces its solutions at ten production sites around the world – from the market for the market.





Partner of the hearing aid industry

Hearing loss (hypoacusis) means a hearing impairment. It can range from a mild hearing loss to being completely deaf. The cause of hearing loss can be anywhere in the hearing organs. This includes the outer ear (consisting of the auricle and the ear canal), the middle ear and the cochlea, as well as the auditory nerve and the auditory pathway up to the auditory cortex, which is located in the human brain. The proportion of those who suffer hearing loss naturally increases with age. Other well-known causes of hearing loss include strong or long-term noise impact, infectious diseases, injury or hereditary conditions. Around 15 million hearing aids are produced and sold around the world every year. The overall market grows by around 4–5 % a year and is extremely interesting for the Cicor Group, given its high requirements in terms of quality and technological know-how. Continuous progress and intensified price competition, which even affects these miniaturized and expensive medical devices, encourage manufacturers to optimize their supply chains. This means that both, the production of electronic and plastic components and individual assembly activities are increasingly being outsourced to reliable, competitive partners.

Hearing aid components currently account for almost 10 % of the annual sales of the Cicor Group. Cicor is represented along the entire supply chain and, thanks to its experience, it also has excellent chances of being able to take on additional production steps in future from both new and existing customers. The market for hearing aid industry suppliers is remarkably large. With the wide range of services offered by Cicor, a global market of around CHF 500 million can be addressed. These include printed circuit boards, plastic parts and tools as well as manufacturing services purchased from external service providers outside the hearing aid industry. There is also a worldwide trend towards hearing aids with wireless rechargeable batteries. The market share of these devices is currently still small and will increase significantly with the introduction of the latest generation of wireless chargers. The Cicor Group already has some experience being a partner of well-known manufacturers of wireless charging systems and is well prepared for this step in the hearing instrument industry.

Services

Today, many well-known manufacturers of hearing aids across the world rely on the various services offered by Cicor:

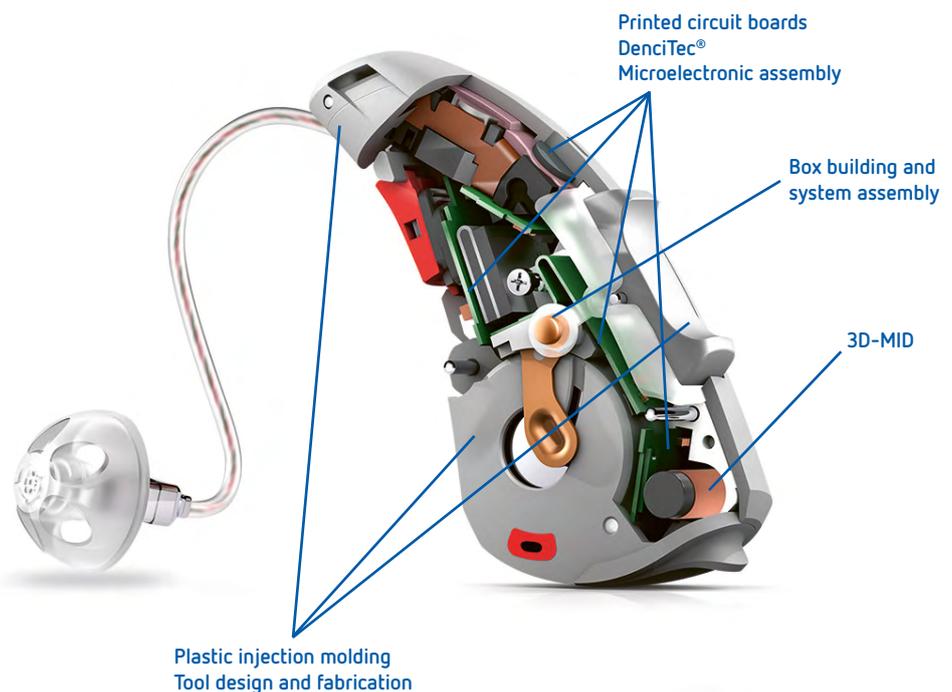
- The Boudry (Switzerland) site supplies flexible and rigid-flexible printed circuit boards to international hearing aid manufacturers. Cicor's particular strength lies in the miniaturization and manufacture of very thin substrates. Cicor is one of the world market leaders in this sector.
- The Batam (Indonesia) site produces high-precision thin-wall plastic components that meet the high quality requirements of the global hearing instrument industry.
- The manufacture of plastic components for the hearing aid industry requires top-quality plastic injection molding tools. The site in Singapore designs and produces high-precision tools that are then used at its manufacturing sites in Singapore, Indonesia and China or directly by customers.
- The electronic components used in hearing aids are getting smaller and smaller. The Radeberg (Germany) site specializes in microelectronic assembly, which is even offered under clean room conditions, and is a preferred board assembly partner for the hearing aid industry.

hearing aid manufacturers, the company also sees further development opportunities in the following sectors:

- With DenciTec®, Cicor has introduced PCB technology with uniquely small line spacing onto the market. DenciTec® makes it possible to manufacture printed circuit boards with a wide range of functions using the least amount of space. This is an ideal fit for the miniaturization trend in the hearing aid industry.
- With its tried and tested 3D-MID technology, Cicor is able to integrate hearing aid antennas directly into the plastic housing.
- Cicor continuously examines new technologies with regard to their potential uses in serial production.
- Thanks to expertise in plastic injection molding under clean room conditions and the assembly of products for international medical technology companies, the Cicor Batam (Indonesia) site is also well prepared for cooperation with hearing aid manufacturers.

In future, hearing aids will be far more than just acoustic instruments, developing into general health monitors. The Cicor Group is constantly on the lookout for new technologies and services to help support customers from the hearing aid industry in product development and manufacturing.

In addition to the services that Cicor currently provides for



Competencies for the hearing aid industry

- Engineering and industrialization of hardware and software
- Consulting and risk analysis
- Feasibility studies and specifications
- PCB layout
- Mechanical design
- Re-design/reverse engineering
- Introduction of new products into production (NPI), from the electronic assembly up to the complete system with configuration variants
- Development of test concepts (AOI, flying-probe, in-circuit, functional tests, x-ray, boundary and frame scan)
- Test engineering hardware and software
- Traceability across the entire product lifecycle
- Prototyping and testing
- Serialproduction
- Medical area with dust-free assembly room
- After sales service
- Life cycle management

Certifications

- ISO 9001 Quality
- ISO 13485 Medical
- ISO 14001 Environment
- Development process is certified:
 - ISO 9001
 - ISO 13485
- Development according to:
 - ISO 14971
 - ISO 60601
 - ISO 62304

The Cicor Group is a globally active development and manufacturing partner with innovative technology solutions for the electronics industry. With about 2000 employees at ten production sites, Cicor offers highly complex printed circuit boards and hybrid circuits as well as comprehensive electronic manufacturing services (EMS) including microelectronic assembly and plastic injection molding.

Cicor supplies customized products and services from design to the finished product from one source.

