Australian Industry WINS!

WTIA National Diffusion Networks Project (NDNP) funded by the Federal and State and Territory Governments and industry

SUCCESS STORY NUMBER MS04: JOINING TECHNOLOGY HELPS THE DEAF AND HEARING IMPAIRED – *Through the WTIA Project, the capabilities of ANSTO and CSIRO are made available to Cochlear Pty Ltd*

Role of the Industry Sectoral Project (ISP)
Through the AusIndustry-supported national Medical Devices and Sensors Industry Sectoral Project (ISP) WTIA, ANSTO and CSIRO have been able to offer valuable technical support to Australian companies in the sector.

The Company
Australian company Cochlear Pty Ltd is a global leader in innovative, implantable hearing solutions. Cochlear pioneered the famous 'Nucleus' cochlear implant and has brought hearing to over 60,000 people around the world over the past two decades. Cochlear is a leading member of the WTIA Project.

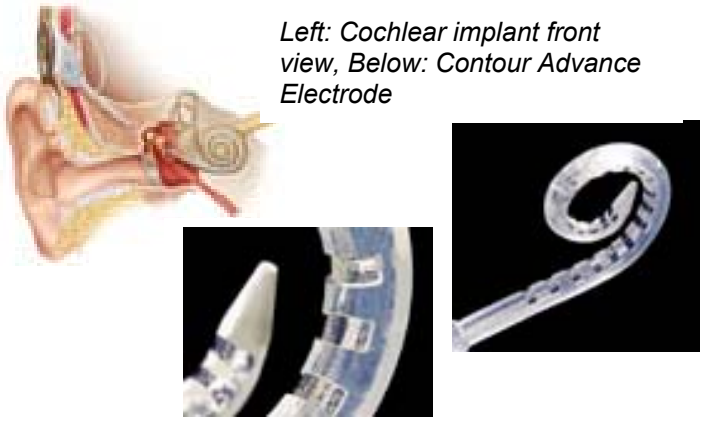
The Cochlear story began back in 1967 when Graeme Clark, inspired by his father's deafness, commenced researching the possibility of an electronic implantable hearing device. The company, based in Sydney, now operates 'Nucleus' clinics around the world. It is also a partner in The Bionic Ear Institute, an independent, non-profit, medical research organisation.

At the heart of Cochlear's product development is one simple idea—innovation. Whether that innovation is focused on performance or features, the principle is the same: Think of ways to deliver capabilities that nobody has thought of before, and improve those that already exist.

The Technology
In keeping with this goal, Cochlear, through its membership of the ISP looked towards the research and technology partners of the ISP for support in a number of areas including:

- Brazing process
- Laser welding joint design
- Training for metallographic procedures
- Examination of soldered assemblies for long-term functional reliability

Brazing process
The aim of this project was to optimise ceramic-to-metal brazing of hermetically sealed components, without affecting the integrity of any other metal components in the device. Samples were prepared and tested using the materials and brazing process expertises at both CSIRO and ANSTO, and a number of positive recommendations were achieved.



Left: Cochlear implant front view, Below: Contour Advance Electrode

Laser welding joint design
The opportunity to optimise joint design in a new component to utilise joining with a pulsed Nd:YAG laser was investigated by the team. It was found that use of this laser would minimise heat input while creating a strong, hermetically sealed joint. Implementation of the technique has show excellent results in throughput and quality of production. CSIRO has world-class laser capabilities available to all Australian industries.

Training for metallographic procedures
Training at the ANSTO facilities assisted Cochlear staff to learn new skills in the preparation of metallographic samples, and interpretation of results, thus increasing the company's in-house capabilities.

Examination of soldered assemblies for long-term functional reliability
When new materials need to be integrated into precision manufacturing, it is important to have proven prior confidence in the products. Before successfully introducing a new solder, Cochlear commissioned the experts at ANSTO to sample the proposed components and analyse the performance of the brazed joint.

Conclusion
Through membership of the WTIA Medical Devices and Sensors ISP, which is supported in NSW by the Department of State and Regional Development, Cochlear has had access to world-class support for their welding and joining applications for the ear implant which has positively affected the quality of life so many people around the world.

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