

Flexibility = Atraumaticity

MED-EL electrode arrays feature wave-shaped wires for maximum atraumaticity

MED-EL electrode arrays are designed to preserve the delicate structures of the inner ear. The electrode arrays feature ultra-flexible wave-shaped platinum iridium wires. The wave-shaped wire design is the key to making a MED-EL electrode array the **world's most flexible and atraumatic**.

Minimising trauma during electrode insertion maximises the benefit to the patient. The wave-shaped wires reduce rigidity by half in comparison to a straight-wire design. Benefits include the preservation of residual hearing as well as the integrity of intraneural tissue targeted for electrical stimulation. **MED-EL offers several different electrode array options, each featuring atraumatic wave-shaped wires.** As a result, each implant recipient can be sure to receive the best possible electrode array for their unique hearing solution.

Flexible, atraumatic arrays to fit each patient's unique cochlear anatomy



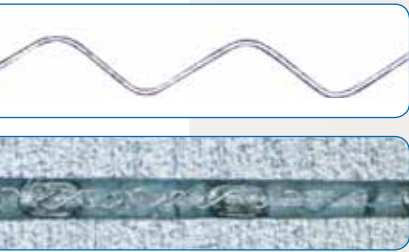
The Electrode STANDARD



In nine out of ten surgeries, the soft, flexible Standard Electrode Array is the preferred solution. With a length of 31.5 mm, the Standard Electrode Array is the longest electrode on the market and features 12 pairs of electrode contacts. It is designed to stimulate the entire cochlea, from the base to the apex, for Complete Cochlear Coverage and the best possible hearing experience.

Wave-shaped wires: Flexible and Atraumatic

Many cochlear implant candidates have some degree of residual hearing which can be preserved. MED-EL has designed an especially soft, flexible electrode array featuring MED-EL's unique wave-shaped wires, designed to reduce insertion force and cochlear trauma during implantation, which aids in preserving residual hearing. The flexible nature of the array allows it to remain on its intended path within the scala tympani during insertion. Cochlear trauma, such as severe fracture of the osseous spiral lamina, can therefore be avoided. This trauma is often associated with more rigid arrays. An array positioned along the lateral wall avoids damage to the medial surface of the scala tympani. Such damage provides a potential pathway for infection into the central nervous system.¹

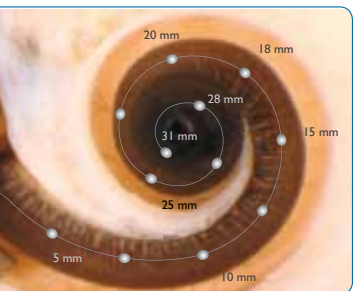


X-ray microscopy by Prof. Hüttenbrink

Complete Cochlear Coverage (CCC)

Complete Cochlear Coverage means that the entire length of the cochlea, from the most apical to the most basal region is stimulated by the implant's electrode array. This coverage can only be achieved by the deep insertion of a long electrode array. Data strongly shows that in both chronic and acute testing, the extent of cochlear coverage has an impact on speech discrimination performance. When the distance between the most apical electrode to the most basal is restricted to approximately 21 mm, performance suffers, regardless of whether this restricted coverage is stimulating the most apical region, the mid-region or the basal region of the cochlea. When the distance of apical stimulation to basal stimulation is increased to 31 mm, performance improves significantly, from 10 to 30%, depending on the speech measure.²

Shallow insertion of short electrode arrays cannot recruit neurons in the apical region. Additionally studies show that there is a decrease in performance in individuals with a deeply inserted short electrode array. Stimulation of the entire cochlea by a deeply inserted, long array provides the implant user with the best possible outcomes in speech performance measures and in sound quality.



¹ Rebscher SJ, Hetherington H, Bonham B, Wardrop P, Whinney D, Leake PA. Considerations for design of future cochlear implant electrode arrays: Electrode array stiffness, size, and depth of insertion. J Rehab Res & Dev 2008; 45(5):731-48.

² Hochmair I, Arnold W, Nopp P, Jolly C, Müller J, Roland P. Deep electrode insertion in cochlear implants: apical morphology, electrodes and speech perception results. Acta Otolaryngol 2003 Jun;123(5):612-7.

A Variety of Electrode Arrays Adapted for the Majority of Anatomic Variations

In addition to the Standard Electrode Array, MED-EL offers a variety of electrode arrays, enabling surgeons to select the optimal solution to fit each individual's unique cochlear anatomy.

Medium Electrode Array



The Medium Electrode Array features 12 moderately spaced electrode pairs and is designed for cases where deep insertion is not desired or is not possible due to anatomic restrictions.

Compressed Electrode Array



Specifically designed for partial ossification or malformation of the cochlea, the Compressed Electrode Array features 12 pairs of contacts equally spaced over a shorter distance to maximise the number of channels available and optimise performance.

Split Electrode Array*



Specifically designed for severe ossification of the cochlea, the Split Electrode Array features two separate electrode branches, one with five pairs and one with seven pairs of contacts. The arrays are designed for insertion into different areas of the cochlea to maximise both the performance and the number of channels available.

* only available with the PULSAR_C100

FLEX^{SOFT} Electrode Array



Similar to the Standard Electrode Array, the FLEX^{SOFT} Electrode Array allows for deep insertion into the apical region of the cochlea (CCC). The specially designed electrode tip offers increased mechanical flexibility for reduced insertion force.

FLEX^{EAS} Electrode Array



The FLEX^{EAS} Electrode Array is designed for combined Electric Acoustic Stimulation (EAS) with insertion no deeper than the basal cochlear turn. The array features a flexible electrode tip with increased mechanical flexibility for reduced insertion force.

	<p>Standard</p> <p>Contact spacing: 2.4 mm Contact extent: 26.4 mm Stimulation channels: 12 Electrode contacts: 24</p> <p>Order number: CONCERTO 07670 CONCERTO PIN 07676 SONATA_{Ti}¹⁰⁰ 04210 PULSAR_{Ci}¹⁰⁰ 03042 COMBI 40+ 01511</p>
	<p>Medium</p> <p>Contact spacing: 1.9 mm Contact extent: 20.9 mm Stimulation channels: 12 Electrode contacts: 24</p> <p>Order number: CONCERTO 07672 CONCERTO PIN 07678 SONATA_{Ti}¹⁰⁰ 04213 PULSAR_{Ci}¹⁰⁰ 03045 COMBI 40+ 02681</p>
	<p>Compressed</p> <p>Contact spacing: 1.1 mm Contact extent: 12.1 mm Stimulation channels: 12 Electrode contacts: 24</p> <p>Order number: CONCERTO 07671 CONCERTO PIN 07677 SONATA_{Ti}¹⁰⁰ 04211 PULSAR_{Ci}¹⁰⁰ 03094 COMBI 40+ 01512</p>
	<p>FLEX^{SOFT}</p> <p>Contact spacing: 2.4 mm Contact extent: 26.4 mm Stimulation channels: 12 Electrode contacts: 19</p> <p>Order number: CONCERTO 07674 CONCERTO PIN 07680 SONATA_{Ti}¹⁰⁰ 04215 PULSAR_{Ci}¹⁰⁰ 03701 COMBI 40+ 03479</p>
	<p>FLEX^{EAS}</p> <p>Contact spacing: 1.9 mm Contact extent: 20.9 mm Stimulation channels: 12 Electrode contacts: 19</p> <p>Order number: CONCERTO 07673 CONCERTO PIN 07679 SONATA_{Ti}¹⁰⁰ 04214 PULSAR_{Ci}¹⁰⁰ 03699 COMBI 40+ 02920</p>
	<p>Split</p> <p>Contact spacing: 1.1 mm Contact extent 1-5: 4.4 mm Contact extent 6-12: 6.6 mm Stimulation channels: 12 Electrode contacts: 24</p> <p>Order number: PULSAR_{Ci}¹⁰⁰ 03095 COMBI 40+ 01714</p>
<p>Insertion Test Device (ITD)</p>	<p>Marker spacing: 2.4 mm Markers: 2x5 Max. ins. depth: 18.0 mm</p> <p>Order number: 02081</p>

EAS Surgery Training recommended

Typical dimensions in millimetres, * Diameter of insertion depth

cochleostomy, RW opening, ** Recommended maximum