Thin-film Microelectrode Arrays
Metal-based microelectrodes are fabricated by thin-film technologies on a Glass substrate. Microelectrode arrays (MEA) based on pinholes with a honeycomb microstructure can be manufactured on a working single-electrode.

**» Thin-film based-electrode features**

Thin-film technologies enable the development of small microstructures (<25 µm) with high resolution and precision.

- **Standard dimensions:** 10 x 6 x 0.75 mm
- **Substrate:** Glass
- **Protective layer:** SU-8 resin
- **Electrochemical cell:** 2 mm Ø
- **Sample volume:** 1 – 5 µL
- **Electrode material:** Platinum or Gold

**» Thin-film electrode packs**

Thin-film mSE electrodes are supplied in 50 units packs. They should be stored at room temperature in a dry place.

**» Applications**

Thin-film microelectrode arrays are a useful tool for enhancing the analytical parameters in multiple applications taking advantages of their inherent properties such as low cost & disposables, reusable, high fabrication resolution, high sensitivity, low reagent consumption as well as non-tedious pre-cleaning procedures.

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<th>Flow Systems &amp; microfluidics</th>
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<td>✓ Study EC reactions</td>
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The electrochemical mSE sensor is based on a three-electrodes (working – WE, reference – RE and auxiliary – AE) approach. The working electrode (1 mm diameter) consists of a metal surface (platinum or gold) coated with SU-8 resin in which is defined different microholes array with a honeycomb structure.

### Electrochemical cell

- **WE – 10 µm Ø pinholes**
- **WE – 5 µm Ø pinholes**

<table>
<thead>
<tr>
<th>Reference</th>
<th>Electrode Material</th>
<th>µHoles diameter</th>
<th>µHoles pitch</th>
<th>µHoles number</th>
<th>Electrode Thickness</th>
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<tr>
<td>ED-mSE-5-Pt</td>
<td>Ti/Pt</td>
<td>5 µm</td>
<td>50 µm</td>
<td>500</td>
<td>50/150 nm</td>
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<tr>
<td>ED-mSE-10-Pt</td>
<td>Ti/Pt</td>
<td>10 µm</td>
<td>100 µm</td>
<td>90</td>
<td>50/150 nm</td>
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<tr>
<td>ED-mSE-5-Au</td>
<td>Ti/Au</td>
<td>5 µm</td>
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### Thin-film microelectrode performance

Thin-film MEA electrodes show the typical microelectrode behavior to enhance the analytical signals by reaching the steady-state in a short time.

*Cyclic voltammogram for 1 mM ferrocene methylalcohol in 0.1 M H₂SO₄ at a thin-film gold microelectrode array (ED-mSE-10-Au). v = 10 mV/s.*

*Electrode pre-cleaning by cyclic voltammetry between -1.5V and +1.5 V [n = 10, v = 100 mV/s] – BGE: 0.1 M H₂SO₄.*
Thin-film Microelectrode arrays

» Thin-film electrodes related accessories

» Drop-cell connector

The drop-cell connector [Ref. ED-DROP-CELL] provides a true user-friendly and robust (long life-time) interface with the potentiostat, enabling the use of microvolume (1 – 10 µL sample drops) with all standard (10 x 6 mm) thin-film (micro)electrodes.

» All-in-One Platform

The innovative All-in-One cell [Ref. ED-AIO-CELL] provides an unique multipurpose interface with movable add-ons that can be easily interchanged for using the standard (10 x 6 mm) thin-film (micro)electrodes. The AIO-cell enables the use of the thin-film (micro)electrodes in static (Drop / Batch-cell) or dynamic (Flow-cell) conditions, fulfilling the requirements of multiple electroanalytical applications.

» All-in-One Platform Add-ons

Different standard methacrylate (PMMA) Flow-cell and Batch-cell add-ons are available for using in combination with the AIO platform. Transparent PMMA is a suitable material for most of the analytical applications. Flow-cell and Batch-cell add-ons are also available in PEEK (polyether ether ketone) on demand. PEEK offers advantages for applications where high mechanical and chemical resistance is required.

**The drop-cell connector and AIO platform are supplied with an universal cable compatible with any commercial potentiostat.**
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