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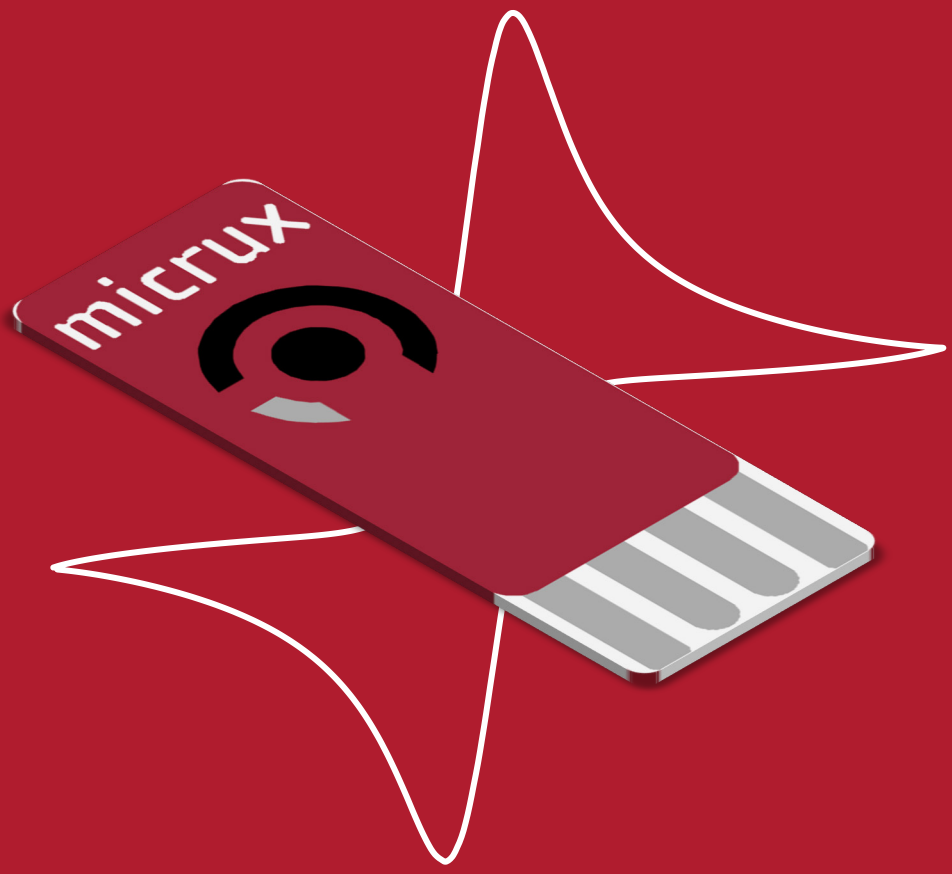
TECHNOLOGIES



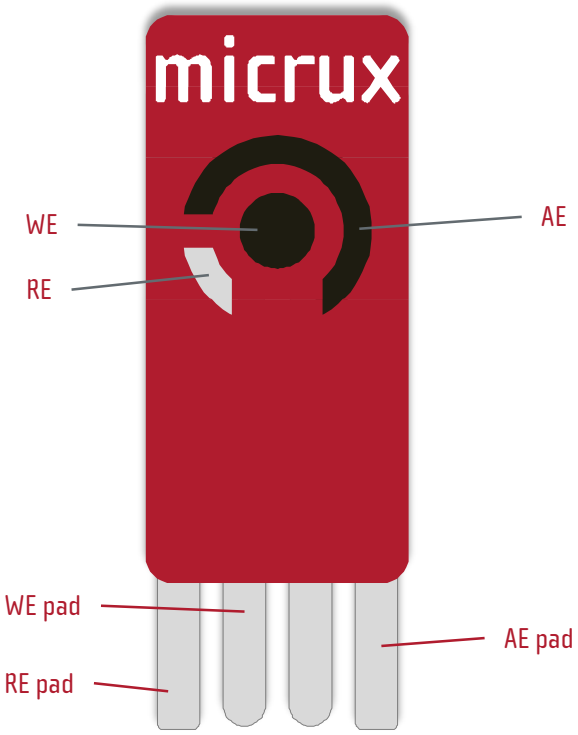
Thick-film Carbon Single-Electrodes

Thick-film carbon single-electrodes

www.micruxfluidic.com

Thick-film carbon electrodes *(ED-51PE-C)* are fabricated by printing technologies on a flexible and high-resist PET or a rigid ceramic substrate. These low-cost and disposable electrochemical sensors enable the use of small sample volume.

» Thick-film based-electrode features



Printing technologies enable the manufacture of planar electrodes suitable for working with sample microdrop.

» Standard dimensions:	27.5 x 10.1 mm
» Substrate:	PET (white) / Ceramic (Al_2O_3)
» Substrate thickness:	250 µm / 380 µm
» WE dimensions:	3 mm Ø (7,1 mm^2)
» Sample volume:	20 – 50 µL
» Electrode material	
Working electrode (WE):	Carbon
Reference electrode (RE):	Silver (or Ag/AgCl)
Auxiliary electrode (AE):	Carbon

» Thick-film electrode packs

Thick-film S1PE electrodes are supplied in 50 units packs. They should be stored at room temperature in a dry place.

» Applications

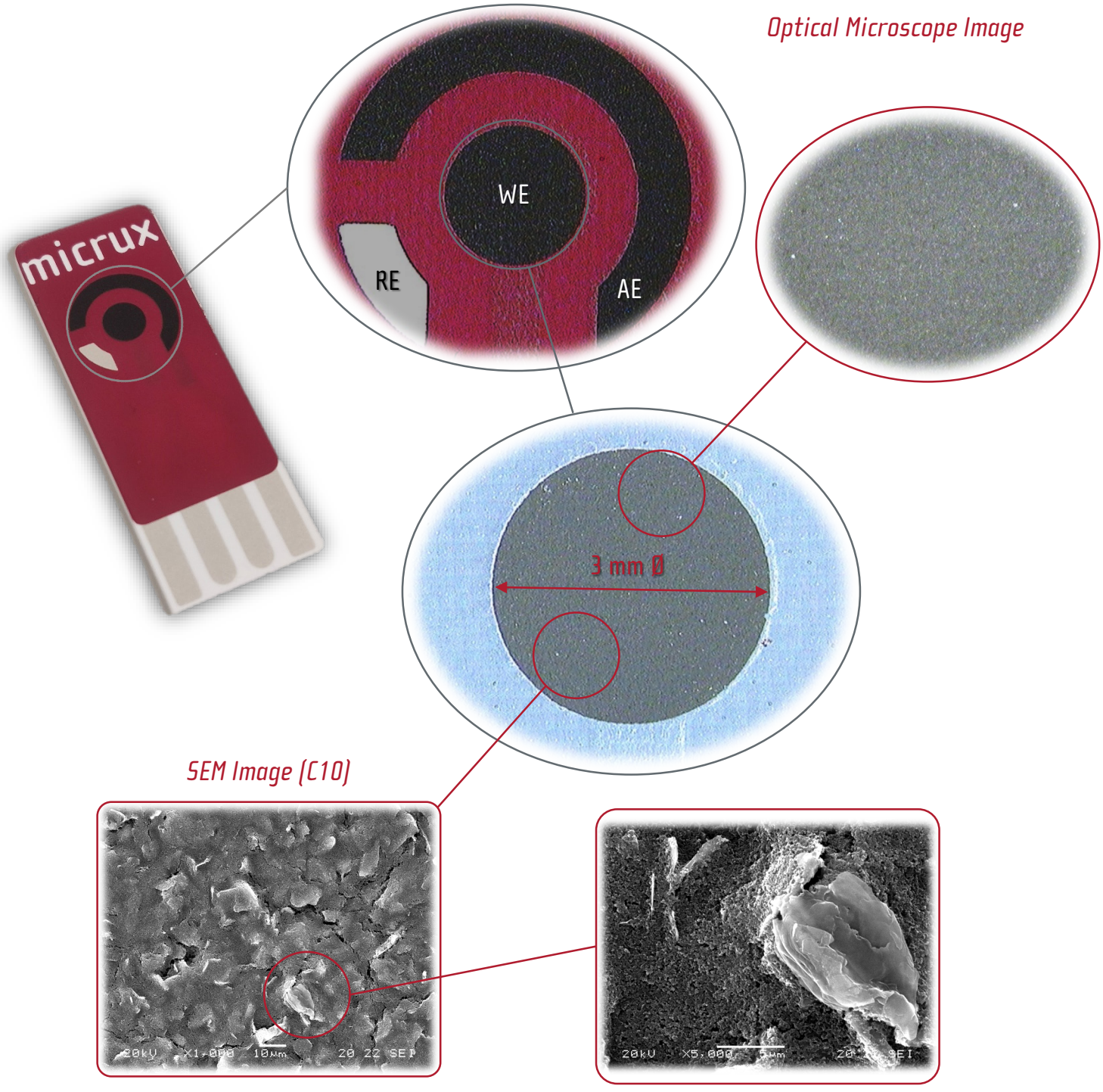
Printed electrodes are a suitable tool for multiple applications, providing many advantages such as low-cost, disposable, low reagent consumption as well as non-tedious pre-cleaning procedures.

Electroanalysis	Nanotechnology	Biosensors	Flow Analysis Systems
✓ Study EC reactions	✓ Modified electrodes	✓ EC transducers	✓ FIA Systems
✓ Trace EC analysis	✓ New nanostructures	✓ New recognition elements	✓ HPLC
✓ In-vivo measurements	✓ New nanomaterials	✓ POC / wearable systems	✓ Capillary Electrophoresis

Thick-film carbon single-electrodes

» Electrochemical cell

Carbon (*Ref. ED-S1PE-C*) thick-film electrochemical sensors are based on a classical three-electrodes (working – WE, reference – RE and auxiliary – AE) approach.

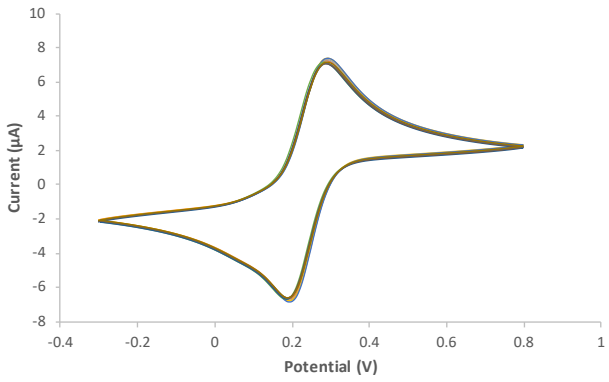


Printed-based electrodes are very useful in order to avoid tedious polishing of traditional solid electrodes, and make easier the development of chemical-sensors and bio-sensors for field analysis.

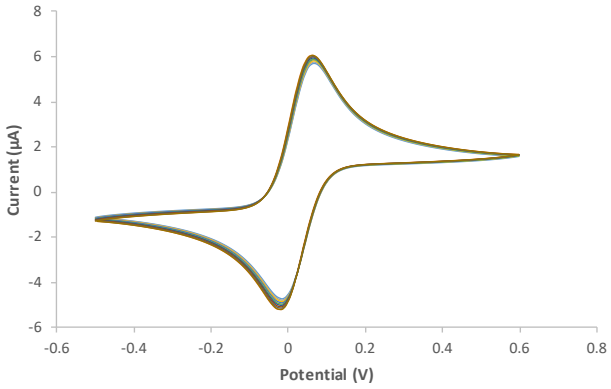
Thick-film carbon single-electrodes

» Thick-film carbon electrodes performance

» Precision intra-electrode

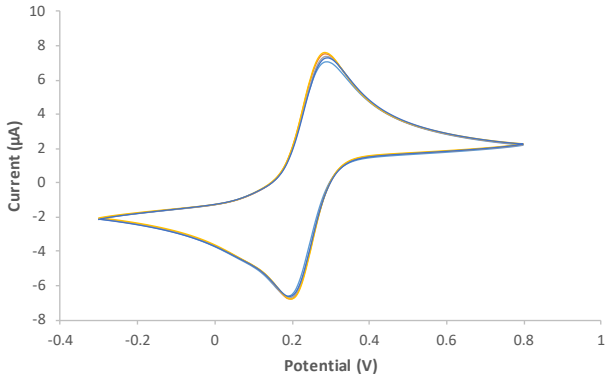


*Successive cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 at the **same** thick-film carbon electrode (**ED-S1PE-C10**). v = 50 mV/s, n = 10, **RSD = 2%***

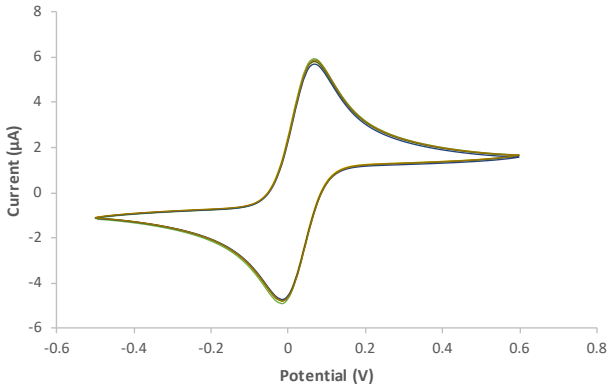


*Successive cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 at the **same** thick-film carbon electrode (**ED-S1PE-C10**). v = 50 mV/s, n = 10, **RSD = 2%***

» Precision inter-electrode

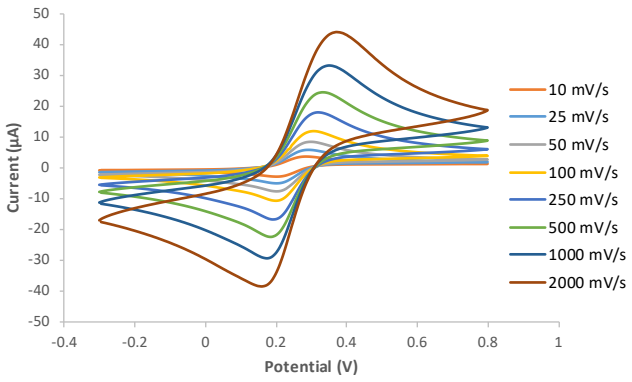


*Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 at **different** thick-film carbon electrodes (**ED-S1PE-C10**). v = 50 mV/s, n = 5, **RSD = 3%***

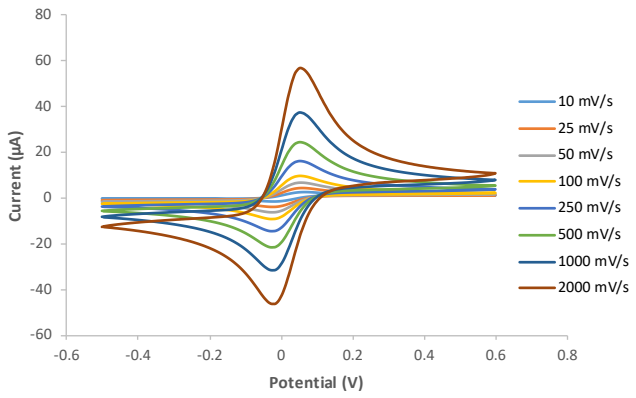


*Cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 at **different** thick-film carbon electrodes (**ED-S1PE-C10**). v = 50 mV/s, n = 5, **RSD = 2%***

» Sweep rate



*Cyclic voltammograms for 1 mM $K_4Fe(CN)_6$ in 0.1 M H_2SO_4 using different **scan rates** at a thick-film carbon electrode.*



*Cyclic voltammograms for 1 mM ferrocene methanol in 0.1 M H_2SO_4 using different **scan rates** at a thick-film carbon electrode.*

Thick-film single-electrodes

» Thick-film electrodes selection

Screen-printed single electrodes (S1PE) are available in different materials (substrates and electrodes).

SKU	Substrate	WE	RE	AE
» ED-S1PE-C10	PET	Carbon	Silver	Carbon
» ED-S1PE-C10C	Ceramic	Carbon	Silver	Carbon
» ED-S1PE-C20	PET	Carbon	Silver	Carbon
» ED-S1PE-C20C	Ceramic	Carbon	Silver	Carbon
» ED-S1PE-C21	PET	Carbon	Silver/Silver Chloride	Carbon
» ED-S1PE-C21C	Ceramic	Carbon	Silver/Silver Chloride	Carbon
» ED-S1PE-CG20	PET	Graphene	Silver	Graphene
» ED-S1PE-CG20C	Ceramic	Graphene	Silver	Graphene
» ED-S1PE-CG21	PET	Graphene	Silver/Silver Chloride	Graphene
» ED-S1PE-CG21C	Ceramic	Graphene	Silver/Silver Chloride	Graphene
» ED-S1PE-Au10	PET	Gold	Silver	Gold
» ED-S1PE-Au10C	Ceramic	Gold	Silver	Gold
» ED-S1PE-Pt20	PET	Platinum	Silver	Platinum

Electrode model:
- S1PE
- D2PE

WE material:
- C1 – Carbon (HP)
- C2 – Carbon (LC)
- CG2 – Graphene
- Au1 – Gold
- Pt2 – Platinum

RE material:
- 0 – Silver (Ag)
- 1 – Silver/Silver Chloride (Ag/AgCl)

Substrate:
- Blank – PET
- C – Ceramic

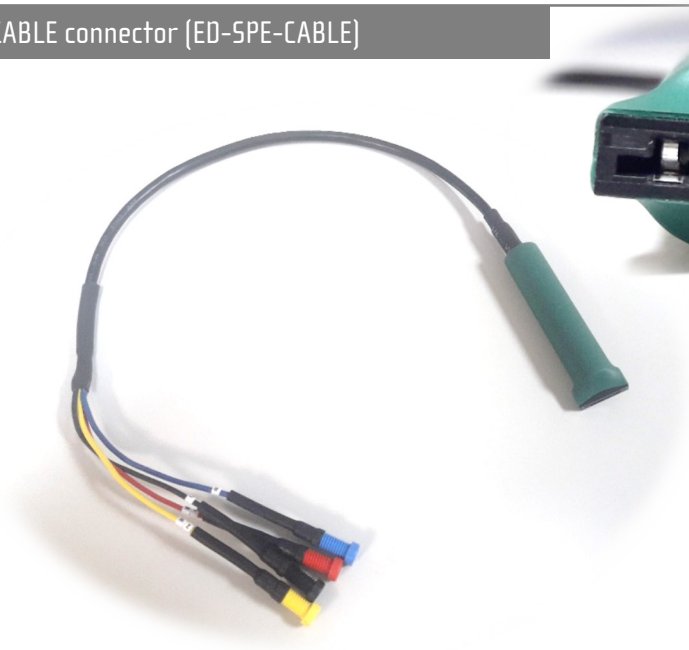
Note: All combinations are NOT available. Please always check the availability for your specific needs.

Thick-film electrodes

» Thick-film electrodes related accessories

Different connectors for interfacing the printed electrodes with any commercial potentiostat are also available at MicruX.

» CABLE connector (ED-SPE-CABLE)



The CABLE connector *(Ref. ED-SPE-CABLE)* provides an interface between the electrodes (up to four contact pads) with the potentiostat, enabling the use of microvolume (20 – 50 µL sample drops) or dipping into a solution. The cable ends are available with **2 mm female or male bananas**.

Dimensions: 50 cm long

» BOX Connector (ED-SPE-BOX)

The small BOX connector *(Ref. ED-SPE-BOX)* provides an interface between the electrodes (up to four contact pads) with any kind of potentiostat, enabling the use of microvolume (20 – 50 µL sample drops). The interface ends are available with **2 mm female bananas**.

Dimensions: L58 x W40 x H15 mm

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