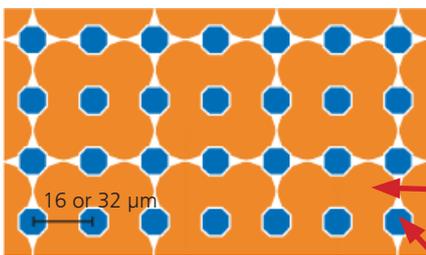


CMOS-MEA Chip

for Use with CMOS-MEA5000-System

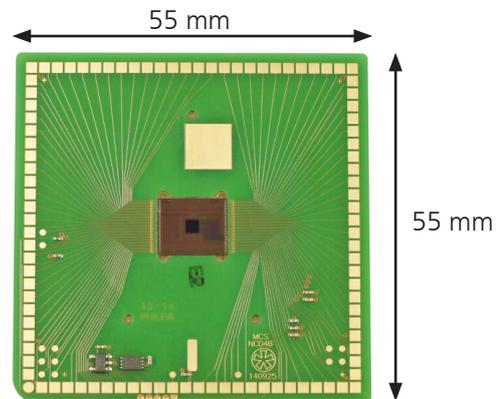
Technical Specifications



Stimulation Sites

Recording Sites

The CMOS-MEA chip is based on complementary metal oxide semiconductor (CMOS) technology



Technical Specifications

Temperature	0 - 125 °C
Dimensions (W x D x H)	55 x 55 x 2 mm
Base material	PCB
CMOS chip	glass like surface
Track material	Bonding wires and Au
Contact pads	Au
Electrode diameter	8 µm
Interelectrode distance from center to center	16 or 32 µm
Active area	1.04 mm x 1.04 mm or 2.08 mm x 2.08 mm
Flat area (around active area)	rectangle: 8 mm x 8.5 mm or round: diameter 6 mm
Recording electrodes	4225 in 65 x 65 layout grid
Stimulation electrodes	1024 in 32 x 32 layout grid

Important!

CMOS-MEAs are not symmetrical! Please take care for the correct orientation of the chip. The round edge of the CMOS-MEA has to be in the front on the left side when looking directly to the open CMOS-MEA headstage.

Sterilization

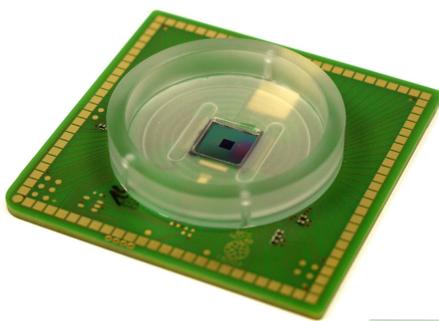
Before using the CMOS-MEA chip, please sterilize the surface with UV radiation, for example, in a conventional flow box.

Warning: Autoclaving of CMOS-MEAs is possible, but not recommended as standard procedure.

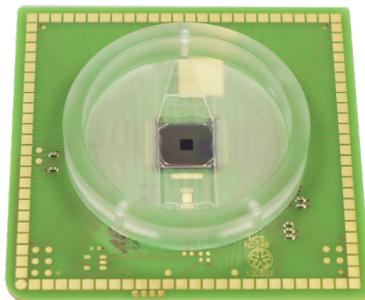
Warning: It is not recommended to treat the CMOS chip in plasma cleaner! Extensive plasma treatment might damage the CMOS-MEAs. Keep treatment short and low power: 60 s at 0.2 mbar and 5 to 10 W.

CMOS-MEA Chip for Use with the CMOS-MEA5000-System

Chamber Types combined with a CMOS-MEA Chip: for the Cell Cultures (-CC), for Slices (-SCB and -SCA).



Use the Slice Chamber Basic SCB for acute slices on the CMOS-MEA chip. It has a flat rectangle area (8 mm x 8.5 mm) for placing the slice. Please use an external Ag/AgCl electrode to ground the bath.



Use the Slice Chamber Advanced SCA for acute slices on the CMOS-MEA chip. It has a flat rectangle area for placing the slice (8 mm x 8.5 mm) with influx and drain for intensive perfusion. Please use an external Ag/AgCl electrode to ground the bath.

Use the Culture Chamber CC with lid for cell cultures on the CMOS-MEA chip. It has a flat round area (diameter 6 mm) for the cell culture. It is possible to cultivate the cells on the chip in an incubator. A ground electrode is integrated in the CC, an external Ag/AgCl electrode is not necessary.

Please note: The lid has to be sealed with a semipermeable membrane. We recommend ALA MEA-MEM-Sheets from ALA Scientific, Inc., which need to be ordered separately.



Cleaning of the CMOS-MEA Chip

CMOS chips are gently cleaned with detergent Tickopur R36 (5%, Stamm/Berlin, 80 degC), and rinsed with ultrapure water (resistivity: 18 MVcm). Fill hot Tickopur solution (80 °C) with a glass pipette into the CMOS MEA chamber onto the electrode field. Remove the Tickopur solution after 2 minutes by rinsing the chip with ultrapure water.

Use a cotton swab for carefully cleaning the surface, if necessary. Please do not damage the surface mechanically, otherwise the chip will be destroyed.

The following cleaning protocol was used in experiments with retina cells. Please read the paper which is online free available: Axonal Transmission in the Retina Introduces a Small Dispersion of Relative Timing in the Ganglion Cell Population Response from Guenther Zeck, Armin Lambacher, Peter Fromherz (2011).

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