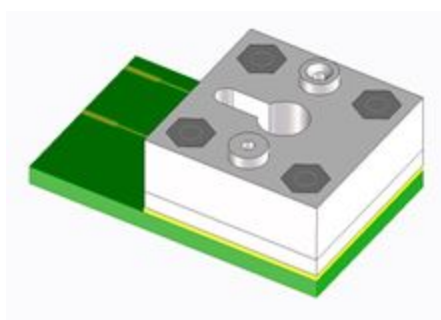

eNPR - Flow cell for Nanopore Chips: Flow cell assembly and cleaning procedure



This short user guide will help you with the flow cell assembly, the testing of the different Chips and with the most common possible complication before starting a nanopore experiment with the eNPR.



Flow cell assembly (in case of **dry** Nanopore Chip)

1. Chlorinate the Ag electrodes on the PCB by adding a drop of bleach on each electrode for at least 10 minutes.
2. Clean the gasket and the O-Ring with Isopropanol or Ethanol, afterwards rinse with ddH₂O and dry.
3. Clean the Nanopore Chip with Isopropanol or Ethanol, afterwards rinse with ddH₂O and dry.
4. Make sure that the top and bottom fluidic chambers are completely dry.
5. Assemble the flow cell according to the stack above. Load the Nanopore Chip normally and tighten the screws securely, so that the seal is tight.
6. Fill the bottom well with 30 µl of salt solution
7. Fill the top well with 60 µl of salt solution.
8. Insert the flow cell into the eNPR reader.

Testing of the Chip

- Use the Elements Data Reader (EDR) 3 software.
- Set the current range to 20 nA and the sampling rate to 20 kHz in the EDR control window.
- Click on the “Start” button in the RC estimation tab in the Analysis window.
- Check that the capacitance of the Chip is >10 pF. If it is below, see the troubleshooting section below.



Troubleshooting

A capacitance value below 10 pF indicates that the buffer solution is not in contact with the nitride membrane.

- Inspect the top side of the Chip for any air bubbles and remove if necessary.
 - If the value is still <10 pF, thoroughly flush and replace the top and bottom solutions with ddH₂O.
 - Aggressively flush the bottom well with Isopropanol or Ethanol (this helps the wetting of the bottom chamber)
 - Flush out the Isopropanol thoroughly with water several times. Be careful not to add any air bubbles.
 - Replace the salt solution in the bottom well. Be careful not to add any air bubbles.
 - Re-measure capacitance.
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- An additional method that helps avoiding air bubbles is to turn the chamber upside down while filling up the bottom solution. This way the air bubbles will escape upwards from the O-Ring.



Flow cell assembly (in case of **wet** Nanopore Chip)

1. Chlorinate the Ag electrodes on the PCB by adding a drop of bleach on each electrode for at least 10 min.
2. Clean the gasket and the O-Ring with Isopropanol or Ethanol, afterwards rinse with ddH₂O and dry.
3. Make sure that the top and bottom fluidic chambers are completely dry.
4. Please be careful with the Si chips, they are more fragile than the glass chips.
5. Remove the Chip from the Eppendorf tube with a pair of tweezers and place it on the chamber, the “pit” side facing upwards (the idea is to keep the flat side of the Chip near the bottom solution so that a bubble does not form in the etched “pit” of the Chip).
6. Place the O-Ring on top of the Chip and seal the chamber tightly.
7. Place a small amount of water (10 µl) on the top side of the Chip to keep it wet.
8. Flush the bottom of the cell with Isopropanol or Ethanol.
9. Flush the bottom of the cell with ddH₂O. Be careful not to introduce air bubbles into the chamber. Finally insert the salt solution on both sides of the cell.
10. Insert the flow cell into the eNPR reader.



Testing of the Chip

- Use the Elements Data Reader (EDR) 3 software.
- Set the current range to 20 nA and the sampling rate to 20 kHz in the EDR control window.
- Click on the “Start” button in the RC estimation tab in the Analysis window.
- If you don't see any current, check the capacitance of the chip by using the amplifier. If solution is in contact with the membrane window, the capacitance should be >20 pF (silicone Chips). If it is <20 pF, the solution has not yet made contact with the Chip itself. If this is the case, see the troubleshooting section below.

Troubleshooting

- Carefully check the top side of the chamber for air bubbles and remove them with a pipette if necessary.
- Flush the bottom chamber with water.
- Aggressively flush the bottom well with Isopropanol or Ethanol (this helps the wetting of the bottom chamber)
- Flush out the Isopropanol thoroughly with water several times. Be careful not to add any air bubbles.
- Replace the salt solution in the bottom well. Be careful not to add any air bubbles.