



EASYCAP

EEG Recording Caps and Related Products

EASYCAP GmbH
Steingrabenstrasse 14
DE-82211 Herrsching
Germany

Tel +49 (0) 8143 992-977
Fax +49 (0) 8143 992-979
www.easycap.de
info@easycap.de

What to do, when Impedances cannot be brought down in Fast'n Easy Electrodes

Given there is no technical defect there are 2 common reasons, why impedances cannot be minimized properly in Fast'n Easy-Electrodes: either dried gel on the sensor surface or else no or too few contact between electrolyte gel and sensor or gel and skin. Both causes are discussed here.

Impedance of unaltered adult skin is around 80 to 140 kOhm. By only degreasing (e.g. with alcohol) impedance is brought down to 20 to 40 kOhm. That's why we explicitly recommend to first to degrease. Only if still lower impedances are required, only the rest of the distance until below 5 kOhm must be done by mechanical abrasion.

Thus, if you encounter impedances higher than the measurement range of 200 kOhm, this is a strong hint, that the electrolyte gel does not contact either skin or sensor. The canonical way to prepare electrodes with good and reproducible success is this:

- with the wooden end of the cotton swab through the center electrode opening I comb aside the hair until I see the skin. (Good light is necessary).
- with the cotton end of the swab dipped in alcohol I degrease this spot of skin by twirling the swab between thumb and index finger.
- with another swab dipped into abrasive paste or Abralyt HiCl I abrade the skin, also by twirling. The effective variable here is not the pressure, it is speed. 4-5 fast twirls with only very moderate pressure will do. More pressure will only produce reddening of skin or scurf.
(- if you are not using Abralyt but a paste solely for abrasion, it now must be removed, as such pastes are not conductive.)
- now I put the tip of the gel-filled syringe directly onto the skin and start to press the piston. This is to establish thorough contact between skin and gel. Only after the gel started to move I slowly pull back the syringe while still pouring gel now fills the electrode opening.
- Towards the end I tilt the syringe in a way that the last bit of gel is pressed directly against the sensor. Again, thorough contact between gel and the whole sensor area is necessary.

Listed like this it sounds complicated, but as soon as a motor program is established it goes like 1, 2, 3.

Now you should reliably have an impedance around 5 kOhm. If not, the most probable reason is, that no or too few gel reached the sensor. Please spackle with the cotton swab more gel directly against the sensor and refill the electrode. If still not satisfactory you can also try to produce a greater contact area from gel to skin, but it is almost never necessary to re-abrade the skin. Again, the important point is, that thorough contact is established between gel and sensor and gel and skin, regardless of any hair, which might be in the way.

It is my subjective impression, that especially people who used my ring electrodes before encounter such contact problems. The reason might be that the large sensor area of the ring electrodes seduced to incomplete filling of the electrode, as somewhere it always happens that the gel contacts the sensor. So from a motivational point of view, my recommendation is to put conscious attention into making contact between the gel and the now very much smaller sensor.

The other frequent reason for reported impedance problems simply are electrodes insufficiently cleaned, so that gel has dried onto the sensor. Dried gel is not conductive any more. The most effective and easy way to prevent this, is to take off the cap directly after use and immediately rinse it clean under the running tap.