



Significantly reduction of the time,
effort and burden of detecting EEG and ECG by using Dry Rubber Electrodes.

Biosignal Rubber Electrode

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Conventional bioelectrodes have various issues such as preparation before attachment, discomfort when wearing

Issues with conventional metal and gel electrodes

Sensing (EEG, ECG, EMG)

- Pain when wearing or discomfort due to coldness
- It is necessary to measure in a wet state such as conductive paste
- Cannot be washed or washed and cannot be used repeatedly
- Sweat reduces hydrogel adhesion and makes peel off the electrode

EMS

- Periodic replacement is necessary due to loss of adhesion
- They need to be wet for better electrical conduction.
- They are difficult to attach to clothing.

Biosignal Rubber Electrode solve various problems of conventional bioelectrodes

Rubber/Elastomer Electrode Biosignal Rubber Electrode . . .

- Flexible, no pain and no chill when worn
- Easy to handle without conductive paste or gel
- Adheres to skin for high contact stability
- Can be washed or wiped with alcohol for repeated use

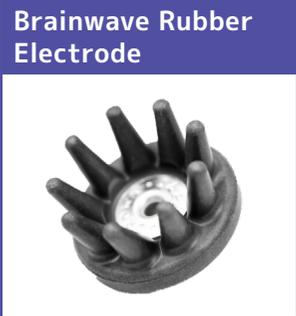


Comparison of characteristics of representative bioelectrodes

Electrode Type Characteristics	General Bioelectrode		Biomedical rubber electrode (NOK)	
	Metal Electrode	Gel Electrode	Brain	Fabric
Material	Metal	Gel	Rubber	Rubber + Cloth
Measurement Conditions	Wet	Wet	Dry	Dry
Fit	×	△	○	○
Handling	△	×	○	○
Contact Stability	△	○	○	○
Repeated use	○	×	○	○

Brainwave Rubber Electrode, a dry rubber electrode for EEG

Evolved to a softer and more comfortable rubber material!



Application image of EEG measurement

Easy to connect with a soft touch

- Soft silicone rubber electrode reduces pain and discomfort when wearing
- Easy to connect with integrated snap fastener

High responsiveness despite dry electrode

- No need for conductive paste, no discomfort, and low noise EEG detection
- Can be used dry, so no need to wash or wash hair after measurement

Can be used repeatedly

- Can be washed or wiped with ethanol, etc. Can be used repeatedly
- Low hardness combined with excellent skin oil resistance

Ideal characteristics for EEG measurement

- Excellent anti-polarization voltage characteristics and reduced electrode potential deviation
- Low resistance to detect EEG by just pressing lightly

Easy to use without gel or paste

Product shapes that can be selected according to application

Brush Type

~ Stable contact with scalp ~



- Easy to connect with general-purpose snap fasteners
 - Can be used for ECG of pets without shaving
- Outer Dia.: $\phi 20$ mm/Height: 15 mm/Brush: 9 pcs

Button Type

For EEG Measurements on the Forehead



- Easy to connect with general-purpose snap fasteners
- Main Unit Outer Dia.: $\phi 14$ mm/Height: 4.9 mm
Boss Outer Dia.: $\phi 4.3$ mm/Height: 2.9 mm

Earpiece Type

For Measurements from the Ear Canal



- For EEG measurement from the ear canal such as earphones
- Outer Dia.: $\phi 11\sim 13$ mm/Height: 8~10 mm

Combines low resistance, biocompatibility and chemical resistance

Ideal for EEG measurement

Material	Silicone rubber (Snap fastener: Brass/Ni-plated)	
Physical properties (Reference)	Hardness (Durometer A)	60
	Tensile strength (MPa)	3.6
	Elongation (%)	358
	Product resistance (Ω)	$< 10^{-2}$
Biocompatibility	Intradermal test	None or negligible
	Skin sensitization test	Not considered to be sensitizing
	Cytotoxicity	Moderate * Derived from silver particle filler
	Skin primary irritation test	No irritation
Chemical resistance	Water	○
	Salt water (assuming sweat)	○
	Oleic acid (assuming sebum)	○
	Moisturizer	○
	Electroconductive paste for electroencephalography	○
	Ethanol	○

*The property values are for reference only for silicone rubber.

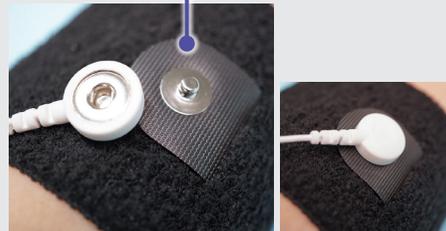
*Complies with REACH (XV II) regulations, complies with the RoHS Directive (10 substances) and SVHC (26 th 233 substances).

Rubberized Cloth Electrode

Thin 0.5mm! Can be used repeatedly dry, and applicable to sewing machine



Band application image



Terminal connection using general-purpose snap button image

Flexible and easy to handle

- Two-layer rubber electrode made of conductive rubber and nickel-plated PET fiber
- Can be sewn and attached to clothing such as innerwear, supporters, etc.
- Can be easily wired by caulking snap fasteners, eyelets, etc.

Dry electrode with high responsiveness

- Can detect ECG and EMG with low noise without using conductive paste, gel, etc.

Can also be used for electrical stimulation

- Can be used not only for sensing but also for electrical stimulation (EMS) applications

Can be used repeatedly

- Excellent durability and hygienic control easily by wiping the surface with alcohol
- Can be washed while attached to clothes, etc. Can be used repeatedly
- No problem with washing with fabric softener or bleach

Can be purchased in requested length

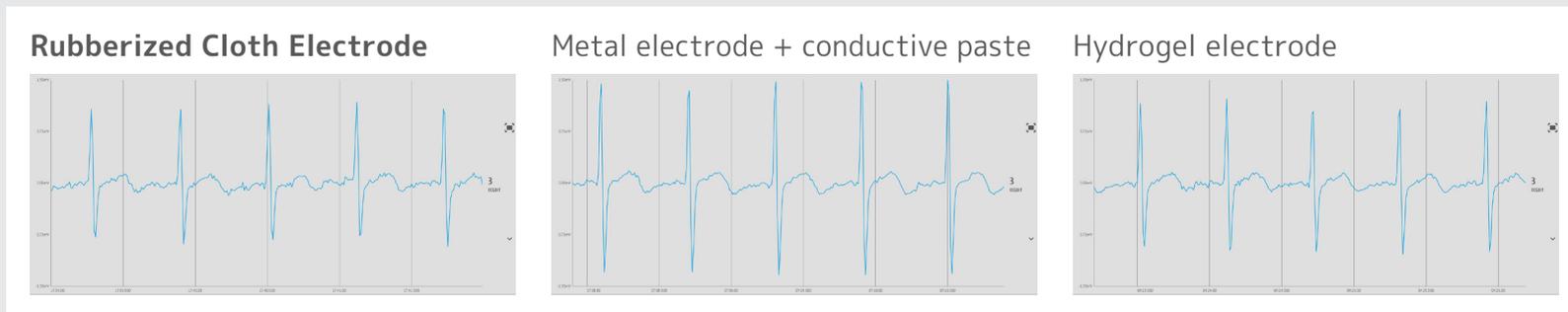
- Can be purchased in units of 30 cm width and 1 m length
- Can be easily cut with scissors, cutter, etc., and processed into arbitrary shape

Detecting biosignals equivalent to metal/gel electrodes

Electrical Resistance does not increase after washing, and can be used repeatedly

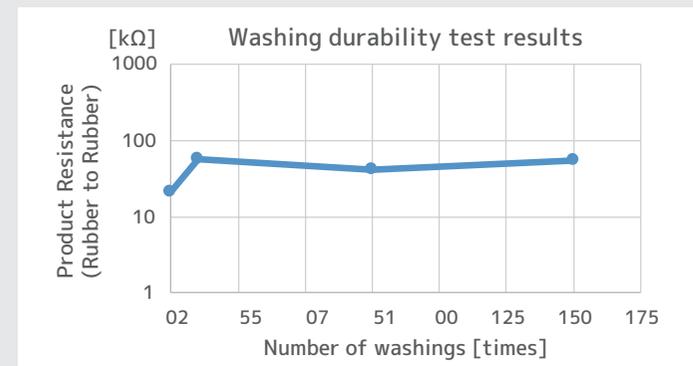
Output waveform comparison

Detecting ECG equivalent to metal and hydrogel electrodes used in wet conditions



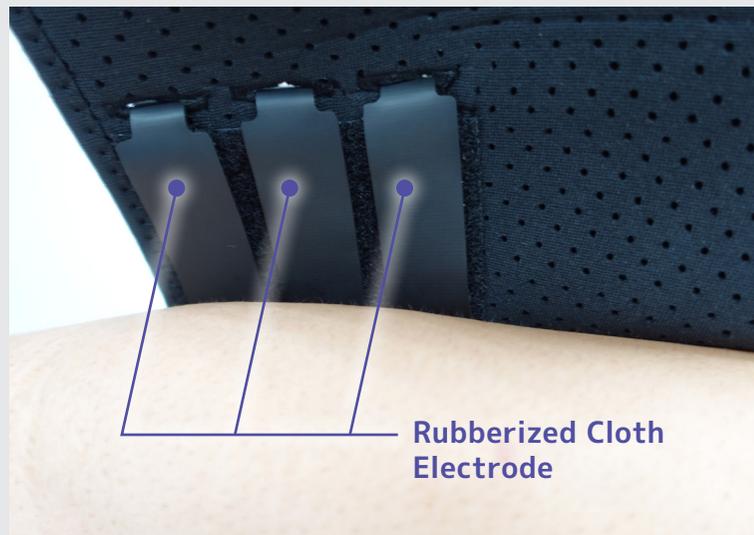
Washing durability

After washing 10 times, 75 times, or 150 times in a washing net, there is no significant change in resistance values.



Since it can be attached by sewing and adhesion Applicable to inner wear and steering

Application to inner wear Image



Application to steering Image



Combines low resistance, biocompatibility and chemical resistance

Can be used not only for sensing, but also for EMS applications

Material		Hydrogenated Nitrile rubber (cloth: PET + Ni plated)
Physical properties (Reference)	Tensile strength (MPa)	7.9
	Elongation (%)	45.9
	Tear Strength (N/mm)	≥10
	Product Resistance (Ω)	< 10K
<p>■ Measurement Method</p> <p>100mm</p> <p>Insulation Rubber Side</p> <p>Cloth Side Insulation</p> <p>Alligator Clip Alligator Clip</p>		
Biocompatibility	Cytotoxicity test	TBC
	Intradermal test	TBC
	Skin sensitization test	TBC
	Primary skin irritation test	TBC
Chemical resistant	Water	○
	Salt water (assuming sweat)	○ (There is a possibility of discoloration of the cloth.)
	Oleic acid (assuming sebum)	○
	Hand cream	○
	Ethanol	○
	Laundry detergent/fabric softener/bleach	Yes (may cause discoloration of cloth)

*Evaluation for REACH and RoHS is under review.

Shipping Package and EC site

Shipping Package

*Subject to change without prior notice.

Brainwave Rubber Electrode



Unit: 5 pcs
(Packaged in a plastic bag with zipper)

Rubberized Cloth Electrode



Selling Unit: Width 30 cm, 1m unit
(Rod winding, air cushion packaging)

EC site

Asone AXEL Shop

AXEL



<https://axel.as-1.co.jp/asone/d/64-0995-55/?q=Sotto>

This EC site carries only Brainwave Rubber Electrode.
If you would like to purchase Rubberized Cloth Electrode, please contact NOK.

Support

NOK supports your development

Dependable



NOK's products are backed by repeated research on the materials used and mechanical designs. They are highly dependable and have been used for many years in a wide variety of machines.

Technology development



NOK's self-contained development system covers the entire process from product design to product inspection. We actively integrate R&D and production technologies to create unique, cutting-edge technologies and products.

Material technology



Material technology is one of NOK's core technologies. We have been working on the material compounding and chemical analysis technologies needed to develop rubber and adhesives used in seal products.

Global development



NOK has established production bases around the world, including Japan, China, and elsewhere in Asia, and have built a stable supply system to meet our customers' needs.

For consultations and inquiries, feel free to **contact us using [this form](#)**.



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