

WEARPLEX Beta Workshop: Soft Skin-Electrode Interface

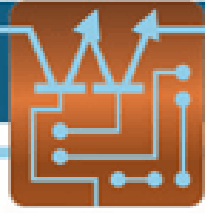


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24th March 2021



IDUN Technologies- Intro

- Reusable biopotential electrode
 - Silicone-based
- Manufacturing competences

2019 – DRYODE™ Alpha



2020 – DRYODE™ Helios

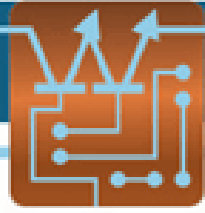


- Reusable soft EEG electrode for scalp
- **New, solvent-based Ink formulation**
 - Scalable manufacturing process

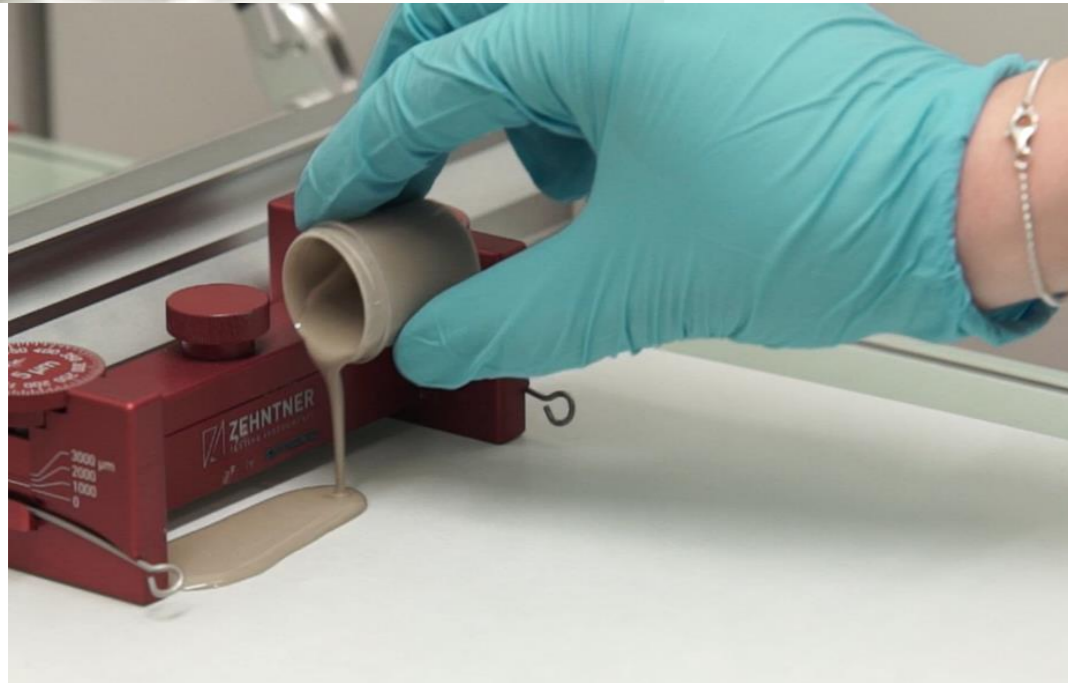
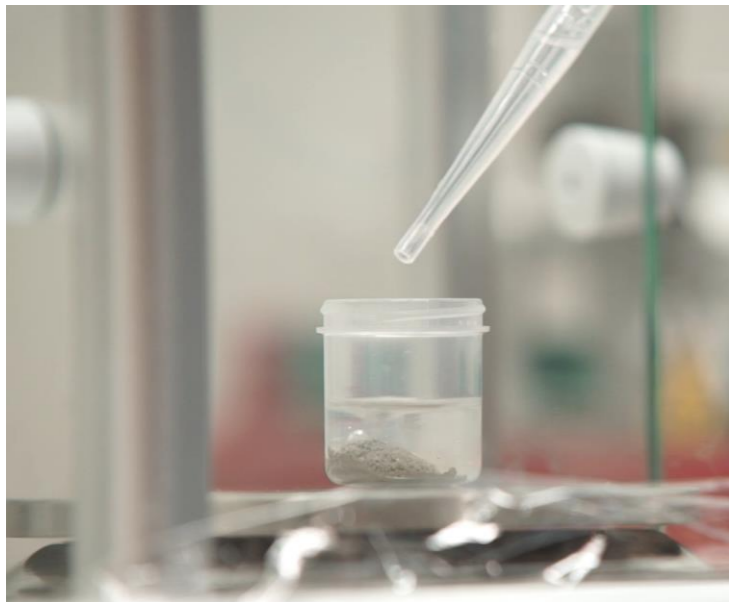
2021 – DRYODE™ Guardian



- Reusable soft in-ear EEG electrode
 - Unobtrusive
- Measurement Electronics
- Full-stack product with brain analytics platform

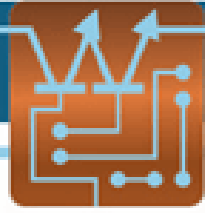


Soft and Flexible Conductive Materials at the Skin-Electrode Interface for Biopotential Recording and Electrical Stimulation

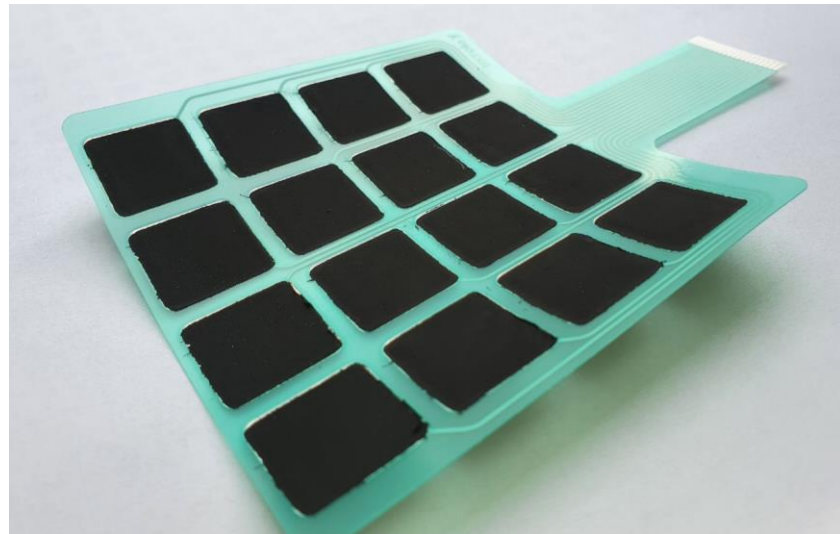


IDUN DRYODE™ Ink

- » Dry contact
- » High electrical conductivity
- » Soft and flexible → Skin conforming, comfortable
- » Suitable for biopotential recordings on the body such as EEG, EMG, ECG...
- » Suitable for Functional Electrical Stimulation
- » Suitable for different coating methods, e.g. Screenprinting, viscosity can be adjusted
- » Good adhesion to various substrates
- » Scalable
- » Biocompatible



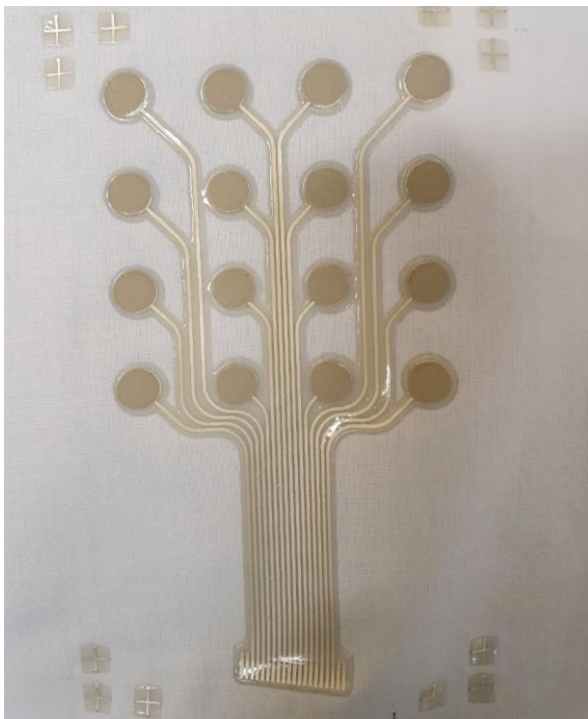
DRYODE™ Inks for WEARPLEX



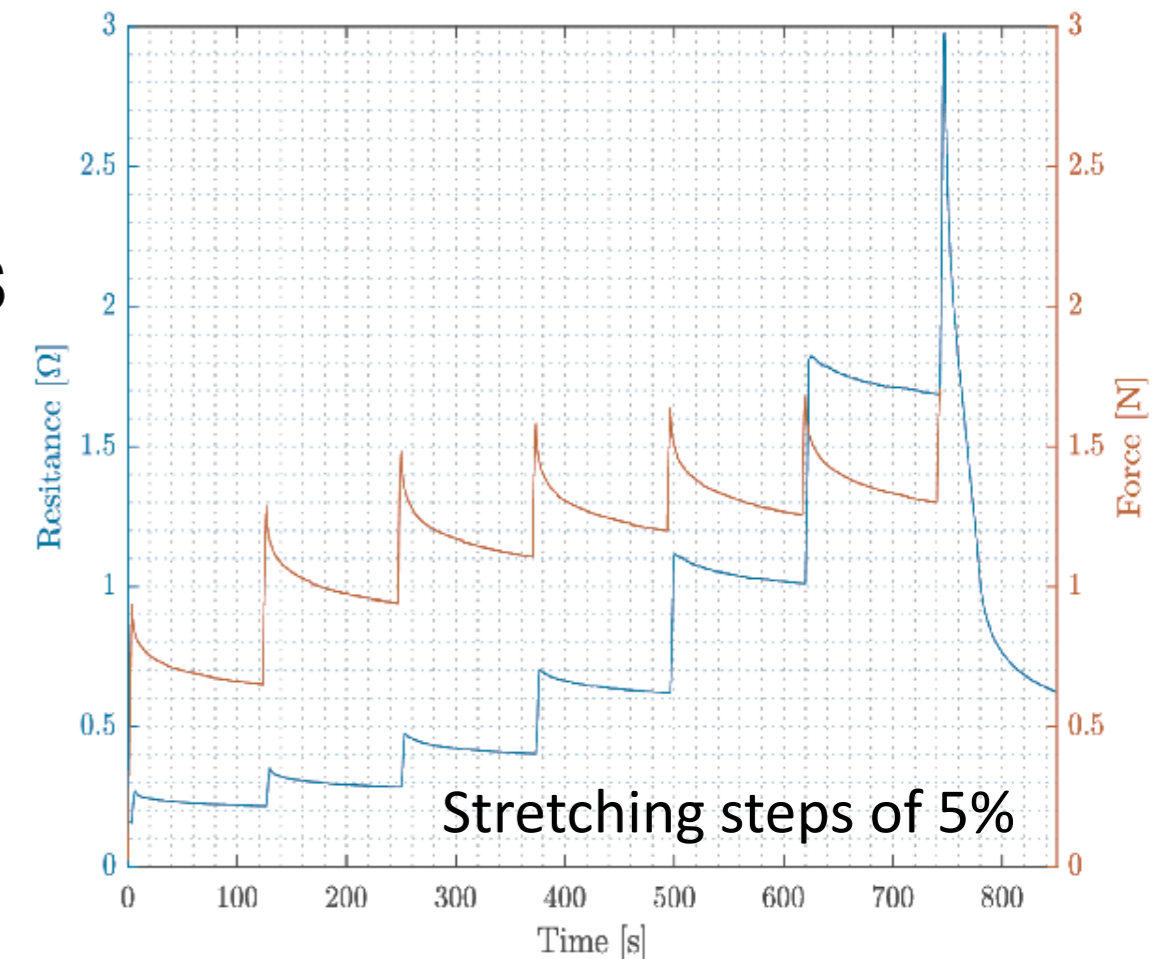
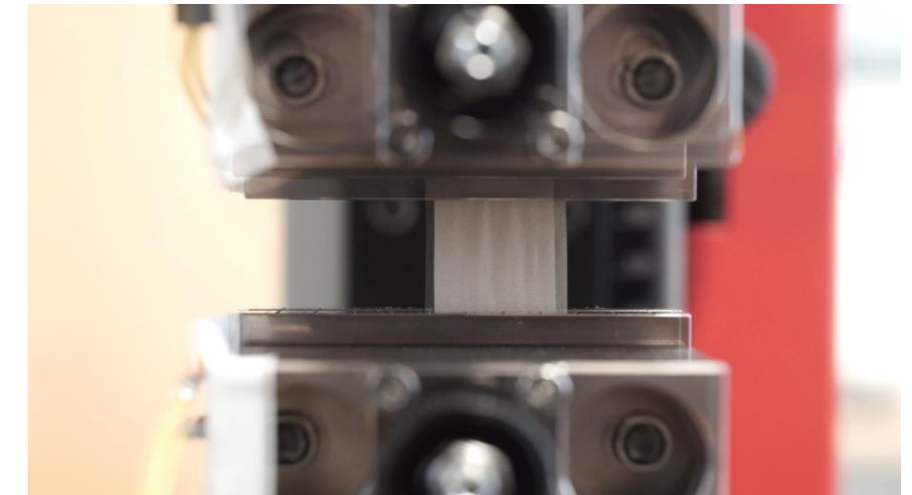
Stimulation Ink on TECSR Substrate

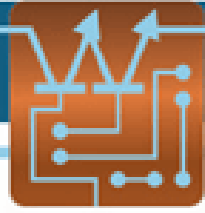
Currently two separate Ink formulations are used

- » Black Ink for stimulation
 - » Stimulation tests by TECSR
- » Tan Ink for recording
 - » EMG measurements by AAU
- » Compared to Alpha version (silicone-based formulation)
 - » Highly improved adhesion to both substrates (UoS and TECSR)
 - » Improved printability
 - » Highly improved mechanical stability and stretchability
 - » More easy handling of new solvent-based ink system, especially with regards to large scale printing



Recording Ink on UoS Fabric Substrate





Future developments for WEARPLEX

- » DRYODE™ Ink Optimization
 - » Optimization of skin contact for better performance
 - » Ink formulation
 - » Deposition method
 - » Thickness of Ink coat
 - » Fine tune viscosity for optimal processing (also for larger scale printing)
- » Optimize in-house sample production process at IDUN
- » Developing a dual purpose Ink that works for recording as well as stimulation

