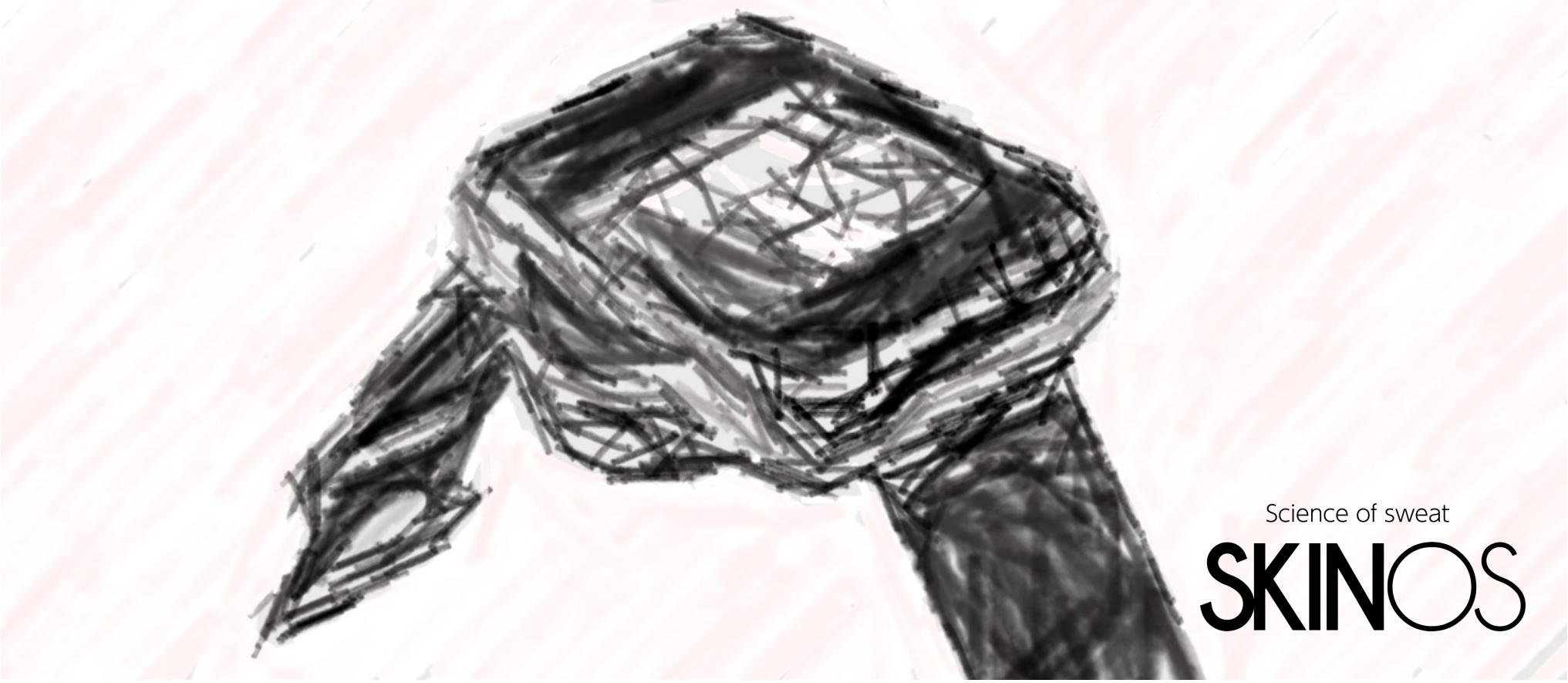
Technology and Products Overviwe



Classification of sweat measurement

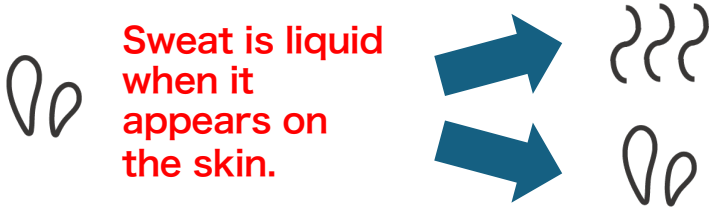
- Perspiration measurement method
  - qualitative
    - **Minor test etc.** — Sweat is stained using a starch-iodine reaction.
    - **Electrodermal activity(EDA).** — Recording changes in the electrical properties of the skin caused by sweat.
  - quantitative
    - Discontinuous Whole body — **Body weight loss** — The amount of water lost from the body (sweat) is measured as weight loss.
    - Discontinuous Global — **Arm bag, Filter paper method etc.** — The sweat is collected in a plastic bag or filter paper and weighed.
    - Continuous Local — **Ventilation capsule method** — The ventilation capsule method is used to visualize the change in sweat rate over time.
- TEWL* measurement method

Minor test

Arm bag

*TEWL : Trans Epidermal Water Loss
The amount of water that evaporates from the skin, which is much smaller than the amount of sweating.

Classification of perspiration sensor principles.



Sweat is liquid when it appears on the skin.

Some of the sweat that appears turns into gas (which then takes away heat).

Some of the sweat that appears remains on the skin in liquid form.

Classification

1)Measured all in liquid state, taking care to avoid evaporation of sweat

Advantage: Easy to determine the total amount of sweat.
Demerit: Difficult to increase resolution, sensitivity, and responsiveness.

2)Measured with all sweat evaporated and all in a gaseous state

Advantage: Resolution, sensitivity, and responsiveness can be improved.
Demerit: Requires a structure that converts liquid to gas.

SKINOS Perspiration Meter
(Ventilated capsule method)

3) Combine 1) and 2).

Not realistic.

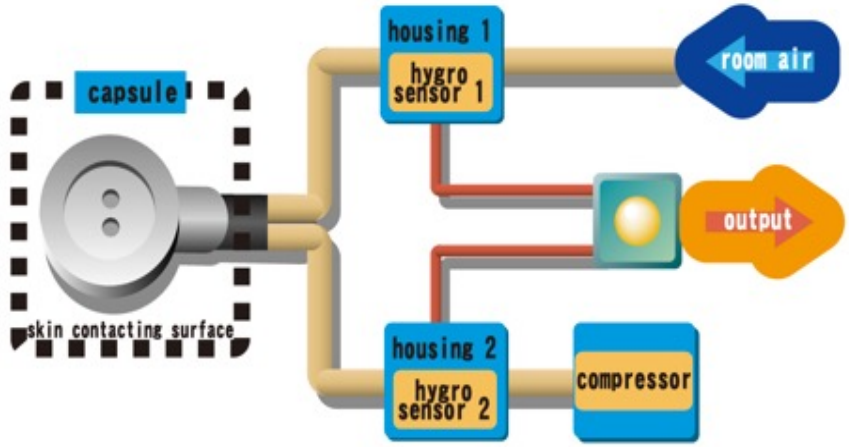
Comparison of sweat meters

	Sweat is measured as a gas.			Sweat is measured as a liquid.			
Method/ Concept	ventilation capsule method		Open Chamber	Filter paper method + Coloring	Filter paper method+ Quantification	Electrical activity	Electrometry
Products	 SKN-2000 (SKINOS)	 SKWL-1000 (SKINOS)	 Tewameter mobile(Courage+Khazaka)	 Sweat checker 1500 (Life Care Giken)	 Connected Hydration (EPICORE)  Hydration Biosensor (NIX)	 SPN-03 (SKINOS)  GRR sensor (tobii)	 hDrop Gen 2(hdrop)
Principle	Sweat is evaporated and acquired as humidity change. It has a built-in ventilation system, which allows the measurement of large amounts of sweat.		Measuring moisture diffusion using a humidity sensor	Sweat is soaked into the patch and displayed as a color change. (not quantifiable)	Sweat is soaked into the patch and quantified.	Visualization of Mental sweating from changes in electrical properties of skin.	Visualization of sweating from changes in electrical properties of skin.
Object	Thermal/ Mental sweating	Thermal sweating	(TEWL)	Thermal sweating	Thermal sweating	Mental sweating	Thermal sweating
Consumables	—	—	—	patch	patch	—	—
wearable	—	Yes	—	Yes	Yes	Yes	Yes

SKINOS Perspiration Meter - Core technology & Advantage -

Difference method ventilation capsule type sweat meter

ambient air moisture



ambient air moisture + perspiration

- The difference method is to detect moisture with two hygrometers.
- One measures ambient air moisture supplied to the capsule. The other measures ambient air moisture + perspiration returned from the capsule.
- The amount of perspiration is calculated from the difference in output between the two hygrometers.

Advantage

① It can measure changes in sweat rate continuously, with high accuracy, and high response.

② Can be used for a wide range of purposes, from small to large amounts of sweating, and from psychological sweating to thermal sweating.

③ No consumables are required, maintenance-free, and easy to operate.

④ Highly safe. The part that is attached to the skin is only a capsule that allows air to pass through, and is completely insulated from the electrical circuit.

⑤ Since it is localized, differences between areas can be evaluated.

Products

Approved as a medical device in Japan

SKN-2000M

2channels desktop type perspiration meter.

【 Usage example 】

- ✓Confirmation of the presence or absence of sweating at the time of diagnosis in anhidrosis patients and confirmation of the effectiveness of treatment. [Medical]
- ✓Identifying the focus of neurological disease.[Medical]
- ✓Clinical trials of drugs and methods for treating sweating disorders.[Medical]
- ✓Verification of cooling methods for the body in hot environments and during exercise.[Sports, Sciences of living]
- ✓Examining differences in sweat rates in different parts of the body and using this information in clothing design.[home economics]

SMN-1000

1channel handy type perspiration meter.

【 Usage example 】

- ✓Measuring emotional sweating and visualizing changes in emotions and feelings. (e.g. using as a lie detector, Checking danger recognition when operating a driving simulator, checking the immersive feeling during a VR experience, checking tension during a presentation, etc.)[Psychology, Engineering, Pedagogy]
- ✓Check the timing of sweating and changes in sweat rate during exercise or in hot environments.[Sports, Sciences of living]

New producs !! Wrist Wearable Perspiration Sensor SKWL-1000

World's first wristwatch device equipped with a highly sensitive perspiration sensor.

Heart rate

Skin tempera ture

Humidity around skin

Atmospheric pressure

Activity Steps CaloriesConsumed

+Perspiration

Changes in sweat rate.

Total body perspiration.

Water supply alert :
Detects early dehydration and promotes rehydration.

Heatstroke warning :
Detects increased physical load and prompts the user to take a break.

SKWL-1000 can meet many needs with just one unit !
Solutions to support the health of blue-collar workers and athletes.

Promotes proper hydration.
Dehydration can lead to a decline in athletic ability and concentration, as well as the aggravation of heatstroke. SKWL-1000 encourages you to replenish with fluids based on sweat rate data.

Notifies you of increased heat stress.
Notifies you of increased risk of heat stroke. Notifies you of increased heat stress based on ISO9886 and American Conference of Governmental Industrial Hygienists (ACGIH) standards. Sweat rate data can be used to improve the accuracy of warning alerts.

Check for sweating disorders.
If you can't sweat, you will easily get heatstroke. Check for sweating disorders associated with autonomic nervous system disorders such as diabetes or skin diseases.

Application of perspiration measurement.

- Sports science, Study of heat dissipation. (Thermal sweating)
- Psychology, Brain science, Study of emotional response.(Mental sweating)
- Dermatology and toiletry.
- Study of comfortable environment.

Company Profile & Contact

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