

DermaLab TEWL Probe



TEWL Probe

The TEWL probe provides objective and reliable measurements of trans epidermal water loss (TEWL) across the outermost layer of the skin, stratum corneum. Measurements can be performed independently or to monitor changes before and after skin interventions or conditions. The TEWL probe and accompanying software enable precise measurements, supporting research and quality assessments in skin analysis.

Technology

TEWL measurements with the Cortex probe are based on Nilsson's vapor pressure gradient model, which states that diffusion of water vapor from the skin into the surrounding air creates a measurable vapor pressure gradient.

The open-chamber probe contains 10 humidity sensors positioned at five different distances from the skin, establishing a water density gradient. TEWL is then quantified using Fick's law and presented in $\text{g/m}^2/\text{h}$.

Specifications

- Principle: Relative humidity and temperature sensors centered in open chamber
- Range: 0-250 $\text{g/m}^2/\text{h}$
- Resolution: 0.1 $\text{g/m}^2/\text{h}$
- Display: Continuous real-time readout of TEWL
- Stop criterias: Standard deviation, time, slope target
- Diameter: 16.3 mm
- Measuring area: 1.0026 cm^2

Benefits

- The TEWL probe features a user-friendly design that enhances both usability and measurement efficiency
- The TEWL probe is small and light, allowing easy handling and measurement
- 5 layers of temperature/humidity sensors ensures low measurement uncertainty and provides accurate information of the pressure gradient
- The open-chamber design maintains natural skin conditions and allows for continuous measurements of TEWL
- The software provides both standard and extended view options to best match user preferences
- The software enables customizable stop criteria allowing the user greater control and flexibility in data collection
- The use of high-quality materials and metal enclosure provides a very robust construction

APPLICATION

Damaging skin conditions may increase TEWL, leading to dry and rough skin. This is commonly seen in conditions such as atopic dermatitis, newly healed wounds and scarring. TEWL may also be affected by factors such as temperature and humidity.

Examples of fields of application with the TEWL Probe:

- Measurement of skin barrier-related parameters
- Research on wound healing and scarring
- Observation of skin-conditions in dermatological research
- Product testing and development, e. g.:
 - Moisturizing creams
 - Anti-scarring products
 - Anti-aging treatments

Note: The probe is not a medical device and is not intended for medical purposes such as diagnosis or monitoring of skin disease.

The TEWL Probe

Is one of 11 parameters available for the customizable skin analysis tools: The DermaLab Combo and the DermaLab Mini. This probe is also available as a single parameter.

To learn more about our solutions, visit cortex.dk



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Selected published studies utilizing the DermaLab TEWL Probe

1. *Skin barrier in Atopic Dermatitis.* **Schmuth, Matthias, et al.** 5, s.l. : Journal of Investigative Dermatology, 2024, Vol. 144.
2. *Deficient functional wound closure as measured by elevated trans-epidermal water loss predicts chronic wound recurrence: An exploratory observational study.* **Chattopadhyay, Debarati, et al.** s.l. : Scientific Reports, 2024, Vol. 14.
3. *Simvastatin cream alleviates dermal fibrosis in a rabbit ear hypertrophic scar model.* **Dolivo, David, et al.** 2, s.l. : Journal of Cosmetic Dermatology, 2023, Vol. 22.
4. *Use of mineral oil as skin moisturizer and evaluated by using DermaLab Combo.* **Azad, A. K. and Azizi, Mohd Wan.** 2, s.l. : Asian Journal of Pharmacy and Pharmacology, 2016, Vol. 3.
5. *Impaired skin barrier and allergic sensitization in early infancy.* **Gerdin, Sabina Wärnberg, et al.** 5, s.l. : Allergy, 2022, Vol. 77.
6. *Deficient functional wound closure as measured by elevated trans-epidermal water loss predicts chronic wound recurrence: An exploratory observational study.* **Chattopadhyay, Debarati, et al.** s.l. : Scientific Reports, 2024, Vol. 14.
7. *Epidermal Barrier Parameters in Psoriasis: Implications in Assessing Disease Severity.* **Morariu, Silviu-Horia, et al.** 14, s.l. : Journal of Personalized Medicine, 2024, Vol. 5.
8. *Superficial Intradermal Injections of Cohesive Polydensified Matrix Hyaluronic Acid Fillers for the Improvement of Facial Pores and Skin Quality: A Split-Face Randomized Study.* **Rutnumnoi, Thanachat, et al.** 5, s.l. : Journal of Cosmetic Dermatology, 2025, Vol. 24.
9. *The Significance of TEWL after Microneedling and Microneedling- Radiofrequency procedures: Histological and IRB-Approved Safety Study.* **Sasaki, Gordon H.** s.l. : Oxford University Press, 2019.
10. *Comparative Study of a Moisturizer and Topical Tacrolimus for Treating Mild to Moderate Atopic Dermatitis: A randomized Single-Blinded Clinical Trial.* **Shim, Joonho, et al.** s.l. : Dermatologic Therapy, 2023.

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