

Tewameter® TM 300 – Assessing the Skin Barrier Function

The measurement of transepidermal waterloss (TEWL) is the most important parameter for evaluating the efficiency of the skin water barrier. Even the slightest damage in the skin water barrier can be determined at an early stage. The Tewameter® is the most accepted and best selling TEWL measurement device worldwide. Many international scientific studies demonstrate its importance in dermatological and cosmetological fields. There are various fields of application. Besides efficacy testing and claim support for cosmetics and pharmaceuticals, and objective clinical diagnosis in dermatology, there is a large application in occupational medicine, medical consultancy, observation of the newborn, the food industry and many more fields.



The Measuring Principle

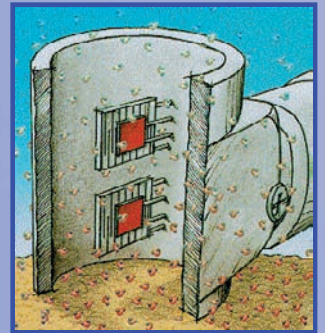
The measurement of the water evaporation is based on the diffusion principle in an open chamber.

The open chamber measurement method is the only method to assess the TEWL continuously, which are necessary for most applications without influencing the skin surface. Due to the modern, high quality

electronics of the probe a stable measurement result is achieved very quickly. The probe is very easy to handle. From all TEWL measurement instruments the Tewameter® shows the most accurate values.

$$\frac{dm}{dt} = -D \cdot A \cdot \frac{dp}{dx}$$

where: A = surface in m², m = water transported (in g), t = time (h), D = diffusion constant (=0.0877 g/m(h(mm Hg)), p = vapour pressure of the atmosphere (mm Hg), x = distance from skin surface to point of measurement (m)



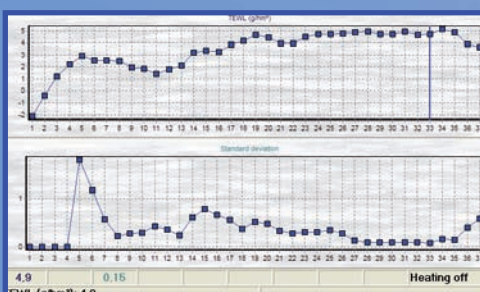
The Probe

The density gradient is measured indirectly by the two pairs of sensors (temperature and relative humidity) inside the hollow cylinder and is analysed by a microprocessor. The small size of the probe head minimizes the influence of air turbulences inside the probe. Also the low weight of the probe has no influence on the skin surface structure and allows easy handling.



The measured water amount flowing through the probe is extremely small,

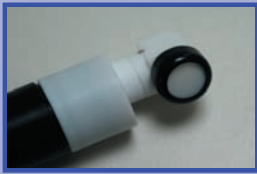
therefore the sensors work best when the probe has the same temperature as the skin. The Probe Heater PR 100 keeps the probe head to a certain temperature range of 28-32°C (corresponding to skin temperature). Thus a stable measurement is reached within a few seconds. This remarkable feature is a great benefit for all users of the Tewameter®.



probe not heated:
stable value after 33 s

probe heated:
stable value after 15 s

on by Measurement of Transepidermal Waterloss (TEWL)



For special applications, measurement values can be recorded over a long time (days).

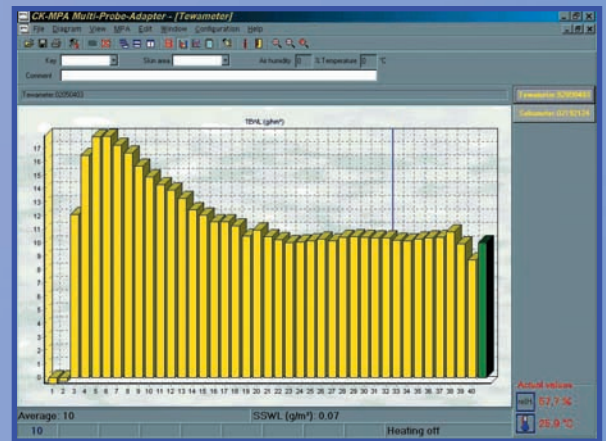
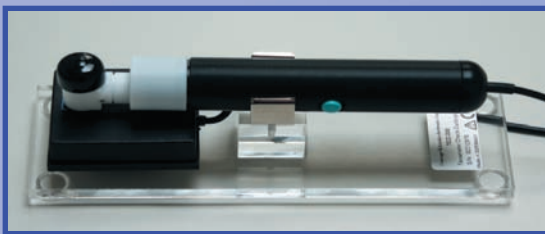
In some cases, where closed chamber measurements might be needed, the probe head can also be used as a closed chamber.

SSWL-Measurement

Besides the TEWL value, the calculation of the SSWL-value (skin surface waterloss after occlusion) and the partial water evaporation pressure (pd) are possible.

Check Calibration

The new technology of the probe does not require frequent, complicated and time consuming recalibration with different solutions. The accuracy of the probe can be checked at any time by a small electronic unit.



Sensor Regaining

A conditioning function (heating the sensor to approx. 70 °C) removes dirt particles from the sensor head. This ensures greater accuracy and prolongs the life of the probe.

Display

Separate display of the values for the upper and lower relative humidity and temperature sensors in the probe is possible. The information about temperature and humidity during the TEWL-measurement is of great importance for the evaluation of the accuracy of the TEWL results.



Disposal rings to keep the probe head hygienical (e.g. for measurements on wounds) or special caps for different applications are available on request.

Technical Data

Dimensions: Hollow cylinder: height 2 cm, \varnothing 1 cm, Weight: 90 g, Probe length: 15.3 cm, Cable length: 1.3 m

Resolution: Humidity: ± 0.01 % RH, Temperature: ± 0.01 °C

Accuracy within 10° C to 40° C and for TEWL-values lower than 70 g/hm²:

relative humidity (RH): ± 1.5 % RH in the range of 30 % RH to 90 % RH; ± 2.5 % RH in the range of 90 % RH to 100 % RH; ± 2.5 % RH in the range of 0 % RH to 30 % RH

waterloss: ± 0.5 g/hm² for RH ≥ 30 %; ± 1.0 g/hm² for RH ≤ 30 % temperature: ± 0.5 °C

Probe Heater: Dimensions: 10 x 11 x 10,5 cm, Weight: 470 g; External Power Supply: 12 V / 4 A

Technical changes may be made without prior notice.