

What Does It Measure?

The CutiScan measures the lateral skin displacement during circular suction/relaxation with a **video camera** (optical flow).

It offers a new dimension of looking at the **mechanical properties** of the skin (viscoelasticity & anisotropy).

The Measuring Principle

The probe combines mechanical force with imaging. It consists of a suction ring which **draws the skin** uniformly in all directions with a constant negative pressure provided inside the CutiScan-device for some seconds. Then the applied pressure is released completely again for some seconds. During the **suction and recovery** time a high resolution CCD camera inside the probe monitors the displacement of each pixel by an **optical flow algorithm** (Horn-Schunk method) in a video. From that video an overall graph of the skin dislocation is calculated,

offering interesting measurement parameters. Each direction in the graph provides a **curve of suction vs. relaxation** (related to those known from other mechanical measurement methods for the skin).

The higher the skin's ability to resist the displacement, the firmer the skin.

According to its **elastic/viscoelastic properties** skin cannot get back to the original position immediately after the pressure has stopped.

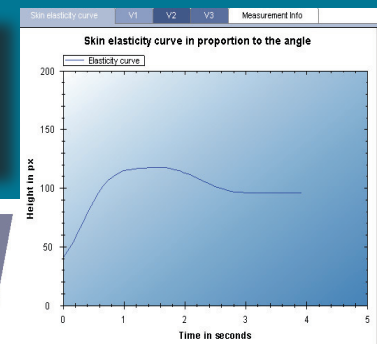
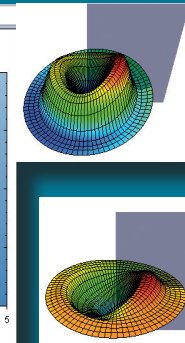
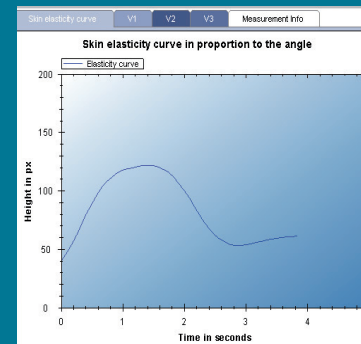
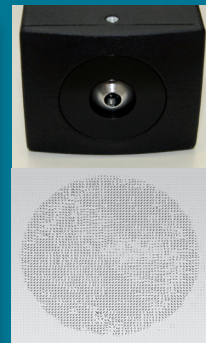
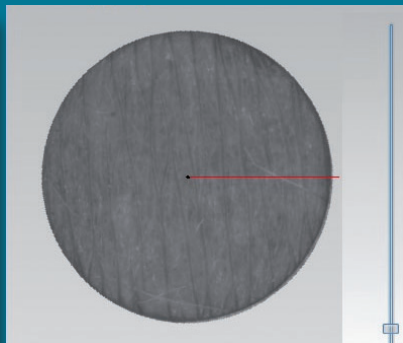
When looking at the skin **displacement in all directions**, it becomes obvious that in some directions the displacement and the returning rate are higher than in others depending on the linearity of the skin (**anisotropy**).

Fields of Application

There are no limits to applications wherever skin aging and elastic properties play a role.

Advantages

- Novel and **promising approach**.
- Information not only about the elastic & viscoelastic properties but also on **directionality** of the skin (anisotropy).
- For each measurement, a **complete video** is taken and saved.
- From this video, a graph consisting of **360 elasticity curves** is calculated. All curves can be saved in Excel®.
- Overall **measurement graphs** are available for maximum and minimum amplitude as well as for the distribution of viscoelasticity. They can be easily transferred into Excel®.



Technical Data

Device: Dimensions: 39 x 22.5 x 7.6 cm, Weight: 4.1 kg; Power supply: external 100-240 VAC, 47-63 Hz, DC 12V/4A;
Port: USB 2.0, type B connector; **Probe with integrated camera unit:** Dimensions: 14.5 x 5.5 x 4.7 cm, Weight: approx. 370 g, Suction ring: 14 mm Ø, Connections to device: pneumatic & USB, Cable length: 150 cm; Camera module: Image area: 5 mm Ø; Resolution: 1280 x 1024 pixel (approx. 1.3 MPix), Illumination: 20 UV-LEDs, (395nm - 400nm)
Measurement principle: suction (pressure setting up to 500 mbar) with simultaneous video of the displacement of the single image pixels, Units: displacement in pixel.
Technical changes may be made without prior notice.

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