

What Does It Measure?

For many years, the measurement of **elasticity parameters** with the Cutometer® Dual MPA 580 has been worldwide acknowledged as **standard method**. The Multi Probe layout allows to connect up to four probes additionally to two Cutometer® probes. A Sebumeter® is also built in.

The Measuring Principle

The measurement is based on **suction**. Negative pressure created by a vacuum pump within the device draws the skin into the aperture of the probe.

Inside the probe, the **penetration depth** is determined by a non-contact optical measuring system. It consists of a light source and a light receptor, as well as two prisms facing each other, projecting the light from transmitter to receptor.

The light intensity varies due to the penetration depth of the skin. The resistance of the skin to be sucked up by negative pressure (**firmness**) and its ability to return into its original position (**elasticity**) are displayed as curves in real time.

Fields of Application

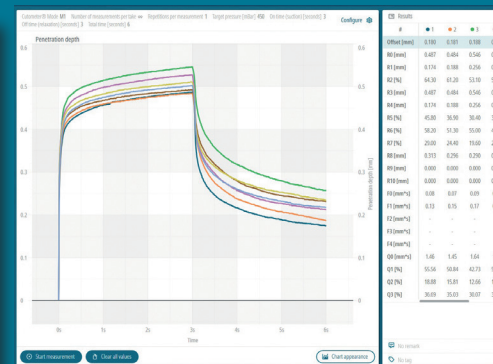
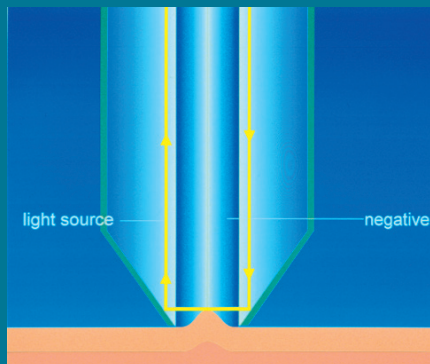
The measurement with the Cutometer® is used as standard in anti-ageing research and cosmetology.

- It is indispensable for formulation, **efficacy testing and claim support** for all kinds of cosmetic products (esp. anti-ageing products, firmness enhancing & anti-cellulite products).
- **Basic research** of mechanical properties of the skin and skin ageing.
- **Other materials** like food or textiles can also be assessed.

Advantages

- **Several probe aperture sizes** (2, 4, 6 and 8 mm Ø) for various skin sites and study requirements (e.g. different skin thickness, scars) are available. **Two probes** with different aperture sizes can be connected at the same time.

- A spring in the measuring head provides **constant pressure** on the skin.
- The **convenient handling** of the probe permits measurements at all skin sites.
- The probe head can **easily be cleaned** after each measurement.
- A multitude of **elasticity related parameters** can be calculated from the curves.
- Intuitive, **graphic explanation** of the various results.
- The settings in the programme are **very flexible** and can be adjusted according to different applications or **study layouts**.
- See the **live offset** at the start of each measurement for the control of pressure when doing **comparison measurements**.
- Export the results and curve data of a complete study directly to **Excel®**.
- Available solely as C+K **MPA system** to be operated with the overall **MPA CTplus software**.



Technical Data

Dimensions: Device: 39,0 x 22,5 x 7,6 cm, Probe: 10,7 cm x Ø 2,4 cm, Aperture: Ø 2 mm standard, (4, 6 or 8 mm on request); **Weight:** Device: 3,9 kg, Probe: 165 g incl. air tube; **Power supply:** ext. 100-240 VAC, 47-63 Hz, DC 12V/4A; **Measurement principle:** suction

Units: µm penetration depth into the probe opening, expressed as curves

Technical changes may be made without prior notice.

Courage+Khazaka electronic GmbH since 1986
Mathias-Brüggen-Str. 91 · 50829 Köln · GERMANY

phone +49 221 95 64 99 0 · fax +49 221 95 64 99 1
info@courage-khazaka.de · www.courage-khazaka.de



Parameters in the Software MPA CTplus

R-Parameters

- R0:** Uf **pliability/firmness** mm (amplitude at the end of the suction phase).
- R1/R4:** ability of the skin to **recover its initial state** (residual deformation in mm at the end of recovery).
- R2: visco-elasticity** in % (resistance to the mechanical force versus ability of recovery)
- R3/R9/R10:** Tiring effects in mm (**Fatigue**) visible for repeated suction/recovery circles.
- R5: net elasticity** in %: U_r/U_e = elastic part of the suction phase vs. immediate recovery during relaxation phase.
- R 6:** U_v/U_e **Portion of the visco-elasticity** of the curve during suction phase in %.
- R 7:** U_r/U_f proportion of the **immediate recovery** compared to the amplitude after suction in %.
- R 8:** U_a **Total recovery** after the pressure is cut off in mm.

F-Parameters

- F 0/F 1** = Area within the rectangle ($U_f \times$ suction time) above the curve/ within the rectangle ($U_f \times$ relaxation time) underneath the curve.
- F 2** = Area above the upper envelope-curve of 10-times repetition of the measuring cycle. The smaller F 0, F 1 and F 2, the more elastic the skin. A completely elastic material will show no area at all. The closer the value to 0, the **more elastic**.
- F 3:** Area within the enveloped curve, represents the **skin fatigue**.
- F 4:** Area beneath the enveloped curve, represents the **firmness** of the skin (resistance to the suction).

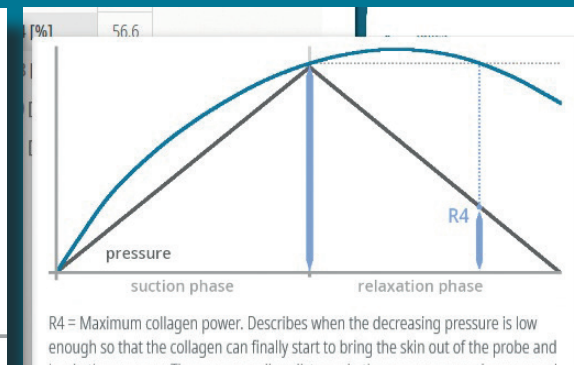
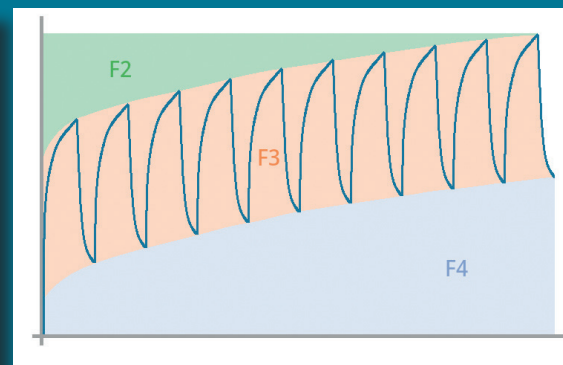
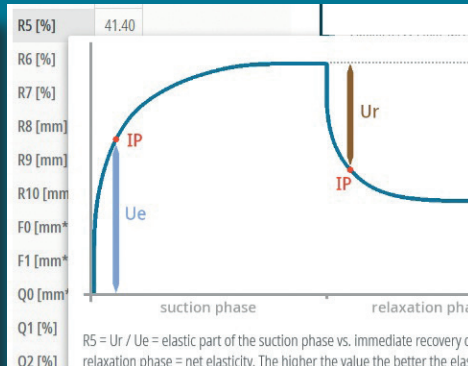
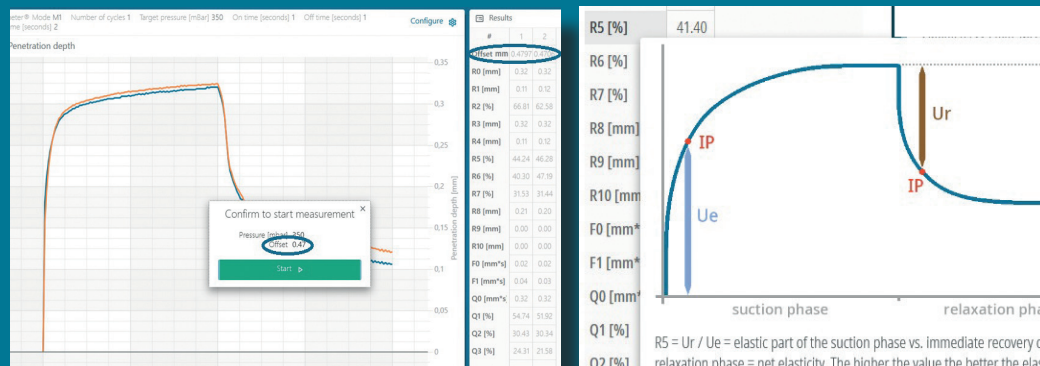
Q-Parameters

Correlations between **skin age and the elastic & viscous recovery** of the curves, developed by Dr. Di Qu*.

- Q 0: Maximum recovery** area, will decrease with increased firmness of the skin.
- Q 1: Total recovery** area, increases with higher elastic recovery.
- Q 2: Elastic recovery**, increases with higher elasticity.
- Q 3: Viscoelastic recovery**, age and treatment independent.

New Aging Parameters for Mode 2 and 3

- R3**=maximum amplitude in mm: At the **end of the suction phase**, the skin does not start to leave the probe or even goes deeper inside, due to **loss of collagen**.
- R4** = **maximum collagen power**: The distance in the pressure curve when the decreasing pressure is low enough for the collagen to bring the skin out of the probe in proportion to the maximum pressure.



Technical Data

Windows® 8 or 10; Screen resolution: minimum 1280 x 720, recommended 1920 x 1080; USB 2.0, 3.0; CPU: Intel i3/i5/i7 3rd generation; AMD Phenom II X4, or higher; Optional dedicated graphics card for smoother curve visualization, RAM: 4GB. The software is license-based. Download it for a 10 days trial from our download section. Technical changes may be made without prior notice.

*Di Qu, Senior Research Scientist, R&D Skin Care, Amway Corporation, Ada, Michigan, USA

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