

What Does It Measure?

Characterizing the **shape of a drop** of water on a surface like the skin and determining its contact angle is a well-known method to analyse **wettability**, skin's free surface energy, its interfacial tension and its **hydrophilic/hydrophobic properties**.

The Principle

When a **defined droplet** is applied to a solid surface, the liquid forms a certain drop shape. The point where the surface, liquid and air meet, determines the **contact angle**.

The relationship between the contact angle, the skin surface free energy, the liquid surface tension and the interfacial tension between skin and liquid is defined by **Young's equation**:

$$\gamma_S = \gamma_L \cos\theta + \gamma_{SL}$$

- θ : Contact angle
- γ_S : Surface free energy of the skin
- γ_L : Surface tension of the liquid
- γ_{SL} : Interfacial tension between surface and liquid

- Contact angle $< 90^\circ$ = hydrophilic surface
- Contact angle $> 90^\circ$ = hydrophobic surface

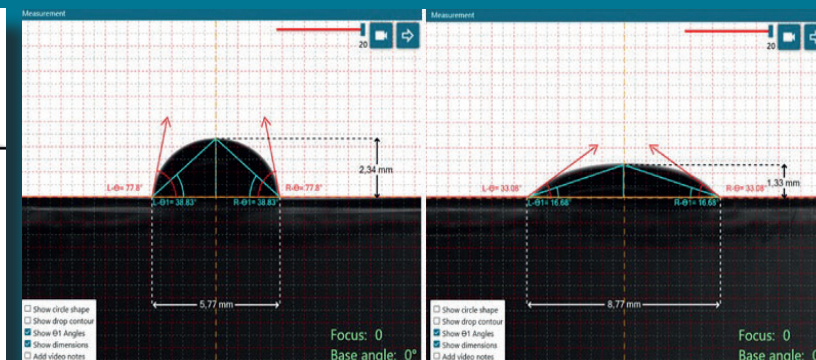
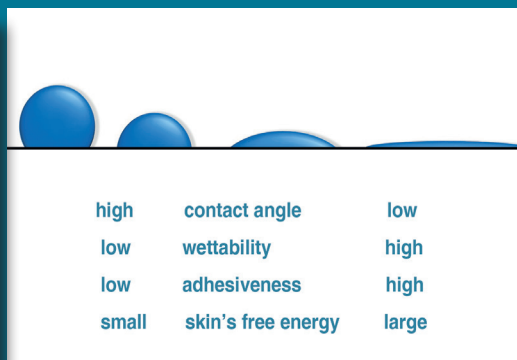
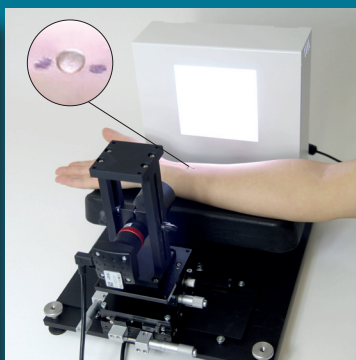
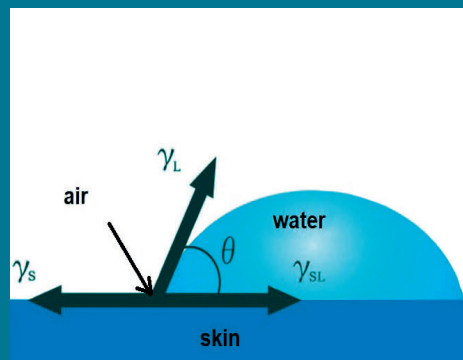
Higher wettability indicates more moisture at the skin surface (higher skin surface free energy). Dry skin shows correspondingly **lower wettability**.

Fields of Application

- **Effect of products** on skin and hair (degreasing, washing, moisturizing).
- Testing of the **spreadability** of products.
- **Water resistance** of products (e.g. sunscreen).
- Testing of **water repellence** of (cosmetic) products (e.g. lip gloss or nail polish).
- **Tissue engineering**, e.g. skin grafts for scars (improved adhesion of cells with increased wettability).

Advantages

- **Compact, flexible** system to analyse skin or other material.
- **High resolution**, sharp image of the drop.
- Modern and **convenient** software
- Very **easy focussing** of the camera.
- **Live calculation** of contact angle and dimensions of the drop.
- **Videos** of the drop placement can be taken.
- Add **Corneometer®** and **Tewameter®** measurements in the same software to get complete skin water-related information.
- **Convenient organisation** of images and results in studies. Evaluate **all data together** by one click.



Technical Data

Dimensions: 52 x 32 x 27 cm; Weight: 9 kg; External power supply: input: 100-240 V, 47-63 Hz, output: DC 12V/4A, port: USB 2.0 type B connector; Camera: 1/2" B/W CMOS-sensor 1.3MP (1280 x 1024 pixels), Illumination: 11 x 11 cm, white LEDs; Computer: Windows® 10/11, USB 2.0/3.0, computer specifications must meet system requirements. Technical changes may be made without prior notice.

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