

**What Does It Measure?**

The Colorimeter Flex CL 440 measures **specifically the colour** of the skin. Measuring values are expressed as XYZ values and are calculated in **L\*a\*b\*** and **RGB** as index values.

**The Measuring Principle**

The probe sends out white LED light, arranged circularly to uniformly illuminate a large part of the skin. When the emitted light hits the skin surface, it is partly reflected and partly scattered. A small proportion travels into the skin and is scattered by the deeper layers. The **light reflected from the skin** is measured in the probe. The raw data of the probe are corrected with a special colour matrix to adapt them closely to standard values and are expressed accordingly.

**Fields of Application**

The probe has been developed especially for the needs of measuring changes in the skin color.

- Cosmetic and pharmaceutical **efficacy tests**, like for sun screen products, self-tanners, make-ups, whitening products, decorative cosmetics, hair care and carotene food supplements.
- Demonstration of aging spots, sun damage, **inhomogeneous skin colour**.

**Advantages**

- **Very reproducible** results on the skin surface, ideal tool for comparison measurements.
- **Specially designed** for skin colour measurement, as the absorption and reflection behaviour of skin differs very much from other materials due to its translucency and the multilayers.
- **Easy to handle**, short measuring time (1s).
- Sealed electronics and removable top pieces can be **cleansed easily**.

- Two **interchangeable measuring tops**: cylindrical 13 mm Ø illumination area (like the predecessor model CL 400) and conical 7 mm Ø illumination area for small skin areas like pigmented spots, nails or lips.
- Unique **placement aid**: Overlapping light spots indicate where exactly the measurement will take place.
- Automatic **calculation of ITA** (Individual Typology Angle) to classify 6 skin colours from very light to dark.
- Light, **constant pressure** of the probe on the skin surface with minimized effect on the surface (pressure on the skin leads to changes in microcirculation and thus in skin colour).
- Easy **check calibration** function.
- **Hair clip** available to place the probe conveniently directly on the hair surface.
- Available for C+K **MPA-systems** and as stand-alone device (MDD). Colour measurement as wireless probe (operation with RR 200 & MPA Wireless software) is supplied with Skin-Colorimeter CL 400 technology.



**Technical Data (for probe with cable)**

Length: 160 mm, Illumination: Ø 25 mm, Measuring area: Ø 6 mm, Illuminated area approx. 13 mm Ø (cylindric), 7mm Ø (conical), Weight: 95 g, Units: XYZ, RGB, L\*a\*b\* index values (due to the unique structure of the skin and the special light source the values do not fully correspond to ISO standards and are therefore expressed as index values).  
 Measurement principle: reflection, Light: 3 white LEDs arranged circularly, range of emitted wavelengths: 440-670 nm  
 Calibration to skin colours with a special correction matrix. Measurement uncertainty: ΔE < 2 units  
 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

