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WORLD LEADER IN PORTABLE SKIN RESEARCH INSTRUMENTS



CATALOG 2023

WORLD LEADER IN PORTABLE SKIN RESEARCH INSTRUMENTS

Delfin Technologies offers innovative, scientifically validated portable instrumentation for measuring various skin properties and the effect of products to the skin.

Delfin offers a wide range of instruments for measuring various skin parameters. Our patented and protected product range is a result of innovative device research and development carried out on a

continuous basis. Instruments are scientifically validated and tested and calibrated for quality and accuracy.

The principle idea of Delfin instruments is that there is no need for a central unit to which you will connect probes. All Delfin instruments are independent intelligence probes that are fully portable and work wirelessly together with our Delfin Modular Core (DMC) software.



DELFIN INSTRUMENTS ARE USED IN OVER 40 COUNTRIES WORLDWIDE

Delfin instruments are used in a wide range of applications from academic skin research to R&D of pharmaceuticals, personal care and toiletries companies, from claims validation studies and clinical trials to zoology.

We focus on delivering the best when it comes to the accuracy and reliability of measurements. Delfin instruments are renowned also for their practicality and user-friendliness. Efficient after-sales service is an integral part of our offering.

Delfin customers benefit from our knowledge database through hundreds of peer-reviewed publications and abstracts in which Delfin instruments have been used. Furthermore, we co-operate globally with a network of expert researchers and advisers.

For further information on Delfin instruments please contact a Delfin office below or one of our official representatives, which are listed on Delfin's web page at www.delfintech.com.

DELFIN SOLUTION BENEFITS

- † Intelligent battery operated probes
- † Sensitive, accurate and reliable measurements
- † Scientifically validated
- † Ergonomic design, extremely practical to use
- † Fast and convenient measurements
- † Simultaneous multiparameter measurements
- † Free selection of probes - add as many as you need
- † Modular design, unlimited expandability
- † No separate central unit
- † Wireless connection to PC, easy-to-use software

DELFIN INSTRUMENTS' APPLICATION AREAS

- † Product and formulation R&D in pharmaceutical, wound care, personal care and chemical industries
- † Skin research studies and clinical trials
- † Medical research applications
- † Efficacy testing
- † Claims substantiation
- † Assessment of skin types
- † Evaluation of skin care and treatments
- † Marketing and promotion of skin care products

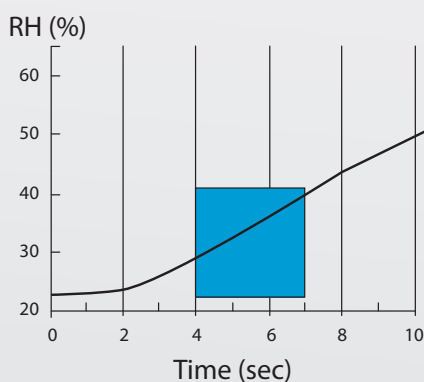
BENEFITS

- Short measuring time, typically 10 seconds
- No horizontally positioned measurement surface needed
- Wide measurement range – accurate up to 200 g/m²h
- Immediately ready to use – no daily calibration procedure required
- Non-sensitive to ambient airflows
- Does not change skin's natural behavior – no artificially created climate change, no de-icing

USED FOR

- TEWL, skin barrier function and penetration studies
- Effect of skin care, treatment and nutrition
- Wound healing
- Sympathetic skin response, hyperhidrosis
- Skin irritation
- Water loss through nails, scalp, lips
- Skin surface water loss
- Material permeability, *in-vitro* studies
- Animal health and zoology

MEASUREMENT PRINCIPLE



TEWL is calculated from the RH increase in the closed chamber.

VAPOMETER

PRACTICAL AND RELIABLE TEWL, EVAPORATION AND PERMEABILITY MEASUREMENTS



VAPOMETER INSTRUMENTATION

The VapoMeter measures transepidermal water loss (TEWL) and evaporation rate as g/m²h. It may be used either as a stand-alone device or measurement data may be collected wirelessly to the DMC software.

The VapoMeter is battery-operated and portable. This offers great freedom of movement and the possibility of measuring difficult areas at any angle. Changeable and re-usable adapters are available for different *in-vivo* and *in-vitro* user applications.

CLOSED CHAMBER PRINCIPLE – NO DAILY CALIBRATIONS

The core of the VapoMeter is a sensitive humidity sensor that is inside a cylindrical measurement chamber. This chamber is closed by the skin or other measurement surface during the measurement period and is unaffected by ambient airflows. The sensor monitors the increase of relative humidity (RH) inside the chamber during the measurement. The evaporation rate value (g/m²h) is automatically calculated from the RH increase. The chamber is passively ventilated between measurements and the ventilation time is automatically controlled.

ADAPTERS FOR DIFFERENT APPLICATIONS



ELASTIMETER

ELEGANT INDENTATION INSTRUMENT
FOR SKIN ELASTICITY MEASUREMENTS



ELASTIMETER INSTRUMENTATION AND MEASUREMENT PRINCIPLE

The portable ElastiMeter eliminates alterations to skin that conventional skin elasticity measurement devices may cause. It is a quick and practical instrument to use.

The ElastiMeter consists of a 0.6 mm length indenter, a reference plate and built-in force sensors. The probe head is briefly pressed against the skin. The indenter imposes a constant

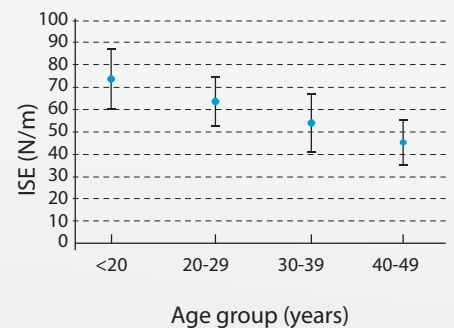
deformation when the reference plate is in full contact with the skin. The skin resists the deformation and the instant skin elasticity (ISE) is determined.

This measurement principle is based on the analysis of the biomechanical response of the skin and subcutaneous tissue and it is mathematically modeled using 3D computational FE (Finite Element) analysis.

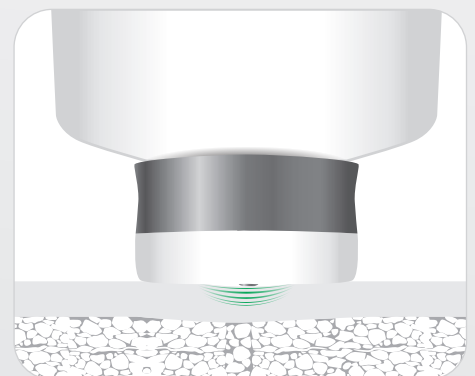
BENEFITS

- Fast and convenient measurement
- Fully portable
- Measure practically at any body site
- Does not alter skin structure
- No central desktop unit needed

INSTANT SKIN ELASTICITY ON VOLAR FOREARM



ELASTICITY MEASUREMENT WITH INDENTATION



*Skin resists the deformation and
ISE (N/m) is determined.*

BENEFITS

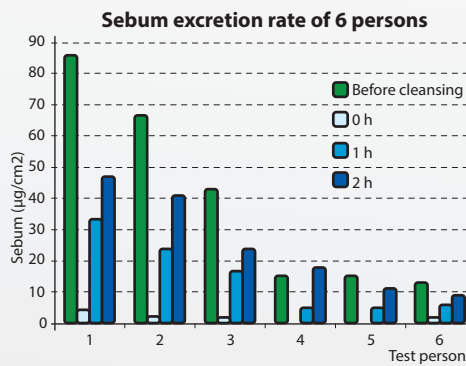
- ♦ Fast and convenient measurement
- ♦ Fully portable
- ♦ Built-in microbalance – no separate desktop unit needed
- ♦ Measures micrograms, not units on arbitrary scales
- ♦ Utilizes advanced quartz crystal sensor technology

SEBUMSCALE

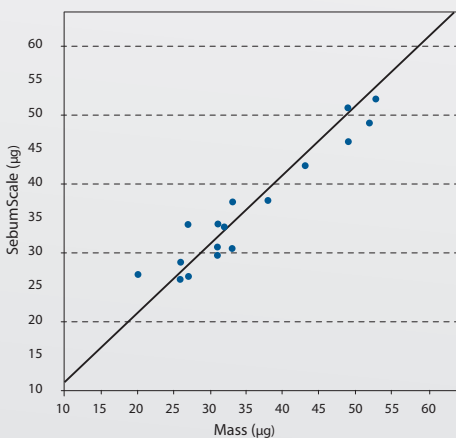
SKIN SEBUM MEASUREMENTS MADE EASY



SEBUM EXCRETION AFTER SKIN CLEANSING



SEBUMSCALE CORRELATION WITH PRECISION BALANCE



SKIN SEBUM

Skin sebum measurements are performed in connection with skin complications and in the claims substantiation of personal care and pharmaceutical products such as cleansers and products for anti-acne and oily skin. Skin sebum excretion measurements with absolute units are now possible for the first time.

The sensitive SebumScale measures the amount of sebum accurately in micrograms and it is a reliable and convenient tool also for skin type assessment and clinical trials.

SEBUMSCALE INSTRUMENTATION AND MEASUREMENT PRINCIPLE

The SebumScale is a compact instrument applying microbalance technology for accurate and repeatable mass weighing. The disposable SebumScale measurement sensors have an effective measurement area of 1 cm². The sensor is briefly placed on the skin and the instrument then measures in a few seconds the mass of the sebum collected from the skin in 0.1 µg resolution.

SEBUMSCALE MEASUREMENT SENSORS



SKINGLOSSMETER

ACCURATE MEASUREMENTS OF SKIN SHINE



SKINGLOSSMETER INSTRUMENTATION AND MEASUREMENT PRINCIPLE

The SkinGlossMeter measures the specularly reflecting light from skin and other surfaces to accurately determine their gloss values. In the SkinGlossMeter the light beam reflects back at the same angle as it contacts the measured surface.

The SkinGlossMeter has an excellent correlation with industrial standard Gloss Units (GU) based on international ISO, ASTM and DIN standards. The displayed Skin Gloss Units (SGU) derive directly from the industrial gloss standard and are actual scaled up units of the values that skin yields.

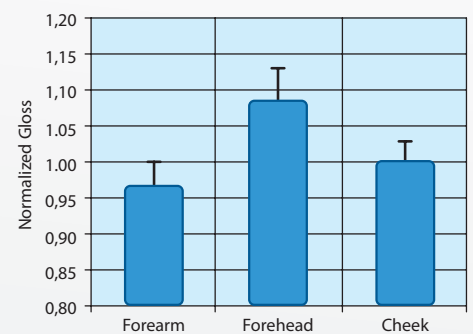
As a light source the instrument has a built-in 635 nm red semiconductor diode laser with the spot diameter of 50 μm .

The gloss values are measured with a photodetector and the total intensity of the reflected beam is calculated. The power of the laser is optimized for accurate measurements and is less than 1mW to ensure that the SkinGlossMeter is a safe instrument to use.

BENEFITS

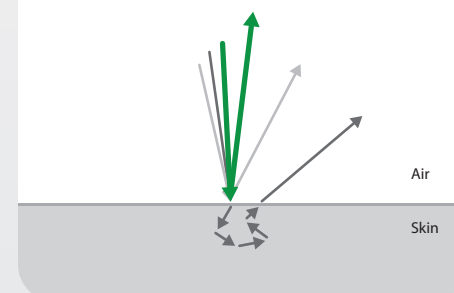
- Direct skin contact
- Short measuring time
- Use on skin, hair, lips and other non-planar surfaces
- No separate desktop needed
- Measures only specularly reflecting light
- Portable and wireless

DIFFERENCES IN GLOSS LEVELS ON HEALTHY SKIN SITES



MEASUREMENT PRINCIPLE

- 1 Specular light, Specular gloss
- 2 Surface scattering
- 3 Tissue scattering



The SkinGlossMeter measures specularly reflecting light (component 1). The light beam reflects back at the same angle as it contacts the measured surface.

BENEFITS

- Highly sensitive measurement of water content and edema in skin and subcutis
- Totally non-invasive
- Local measurements on virtually all areas of the body
- Probes for different measurement depths up to 5 mm

USED FOR

- Lymphedema – related to cancer, surgery, drugs and trauma
- Edema – cutaneous edema, venous edema, postoperative edema, tissue water status
- Wound healing, burns and thermal injury
- Radiotherapy – acute and late radiation reactions
- Irritant and allergic skin reactions
- Pharmaceutical research and product development – effects of topical drugs in skin, transdermal delivery
- Personal care R&D
- Skin research studies
- Treatment effects

LOCAL MEASUREMENTS OF TISSUE WATER

MOISTUREMETERD

The **MoistureMeterD**, the **MoistureMeterD Compact** and the **MoistureMeterEpiD** are part of the MoistureMeterD product family. They measure tissue water content at different depths locally and non-invasively.



MOISTUREMETERD INSTRUMENTATION

The MoistureMeterD is a desktop model consisting of a measuring unit and four probes for different measurement depths from 0.5 mm to 5 mm in effective measurement depths. The LCD screen displays the three most recent TDC (tissue dielectric constant) readings.



SELECTING PROBE SIZE

PROBE	APPLICATION EXAMPLES
XS5	Cosmetic products, transdermal drug penetration
S15	Irritation reactions, wound healing, burns, transdermal drug penetration
M25	Blood circulation, lymphedema, postoperative edema
L50	Subcutaneous tissue metabolism, cellulite treatment

MOISTUREMETERD COMPACT



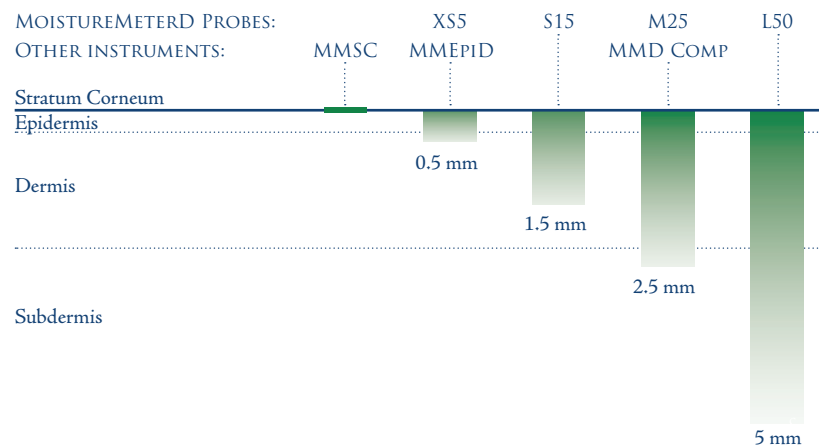
MOISTUREMETERD COMPACT INSTRUMENTATION

The MoistureMeterD Compact is an all-in-one measurement unit that is composed of an integrated probe, a built-in contact pressure sensor and a display. The display shows measured values in percentage water content (PWC, 0 to 100 %) down to an effective depth of 2.5 mm.

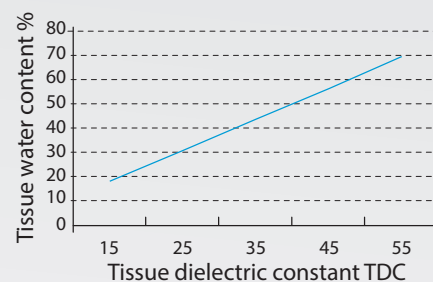
MEASUREMENT PRINCIPLE

The MoistureMeterD generates a high frequency, 300 MHz, low power electromagnetic (EM) wave which the tissue is exposed to. The reflected EM wave is registered and the obtained value is a dielectric constant, which is proportional to the water content of the measured tissue. The value increases with increasing water content and edema.

MEASUREMENT DEPTHS

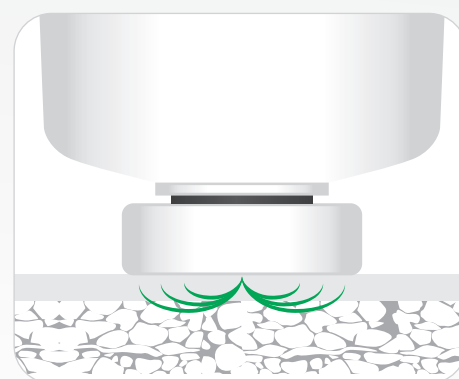


RELATION BETWEEN MOISTUREMETERD AND MOISTUREMETERD COMPACT MEASUREMENTS



Tissue dielectric constant is converted to percentage water content reading.

LOCAL EDEMA MEASUREMENT



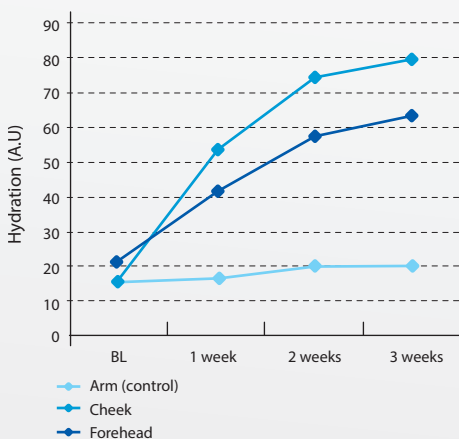
EM field is induced into the skin and PWC is measured.

BENEFITS

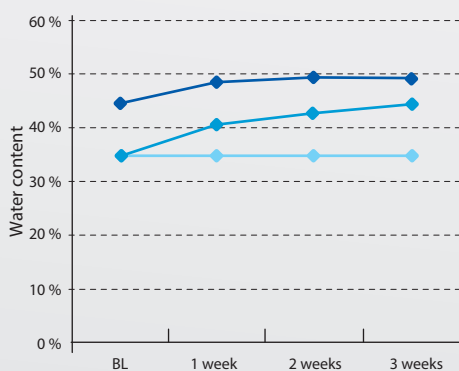
- Highly sensitive measurement of hydration changes down to epidermal layer
- Displays tissue's percentage water content (0 - 100 %)
- Fully portable with rechargeable battery
- Built-in pressure sensor for consistent, reproducible and user-independent measurements

MOISTURE MEASUREMENTS AFTER 3 WEEKS' USE OF DEEP HYDRATING CREAM

Surface hydration, measured with Delfin MoistureMeterSC



Deep hydration, measured with Delfin MoistureMeterEpiD



MOISTUREMETEREPID

RAPID MEASUREMENT OF SKIN'S DEEP HYDRATION



SKIN'S DEEP HYDRATION

Measurement of tissue's percentage water content at epidermal level provides important information to assist with understanding skin healthiness and the effect of products and ingredients on the skin. Delfin's unique MoistureMeterD product family introduces a practical and cost-effective way to measure skin hydration at the epidermal layer.

MOISTUREMETEREPID INSTRUMENTATION

The MoistureMeterEpiD is an all-in-one measurement unit that is composed of an integrated sensor probe, a built-in contact force sensor and a display. The display shows non-invasively measured local percentage water content (0 to 100 %) effectively in the epidermis.

MOISTUREMETERSC

SENSITIVE AND ACCURATE SKIN SURFACE HYDRATION MEASUREMENTS



SKIN HYDRATION

The measurement of skin hydration at stratum corneum level is one of the most measured properties of the skin. Since the thickness of the stratum corneum varies by body area, as does also the thickness of the stratum corneum's dry layer, it is important to take these into account and not use a constant measurement depth. The patented technology of the MoistureMeterSC addresses these issues and ensures sensitive, reliable and user-friendly measurements.

MOISTUREMETERSC INSTRUMENTATION

The MoistureMeterSC is an all-in-one unit that comprises a sensitive round probe head, a built-in contact force sensor and a graphic display. Measurement values as well as the used contact pressure are displayed on the screen.

MEASUREMENT PRINCIPLE

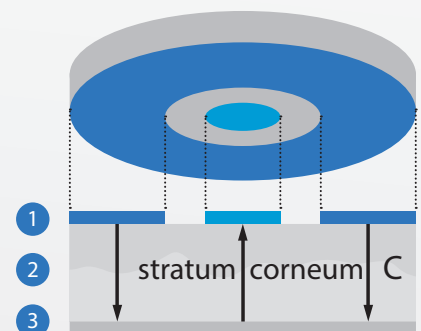
The measurement principle of the MoistureMeterSC is based on the layered capacitive structure of the skin. The capacitor plates are formed from the probe and the highly conductive epidermal layer while the dry layer of the stratum corneum acts as an insulator. The measurement depth of the MoistureMeterSC varies and is determined by the thickness of the stratum corneum's dry layer.

MoistureMeterSC measurement values are arbitrary units and a combination of the dielectric constant and the changing thickness of the stratum corneum's dry layer. This technique makes skin hydration measurements extremely sensitive and reproducible.

BENEFITS

- Built-in pressure sensor for consistent, reproducible and user-independent measurements
- Non-sensitive to electrolytes
- Small and lightweight for easy handling
- Measurements on all body sites
- Probe can be easily cleaned

LAYERED CAPACITIVE STRUCTURE OF THE SKIN AND ELECTRODES



- 1 Probe electrodes - conductive
- 2 Stratum corneum - low water content, poorly conductive, insulator
- 3 Epidermis and dermis - high water content, conductive

BENEFITS

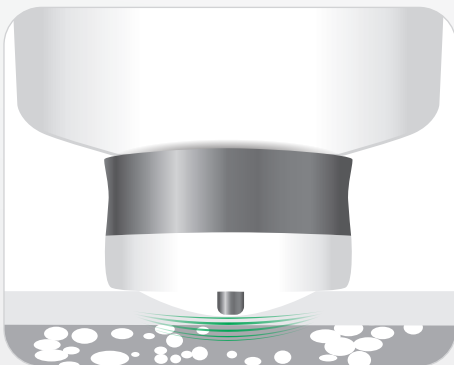
- Fully portable indentation instrument
- Measures induration of skin and upper subcutis non-invasively
- Fast and sensitive measurement
- Does not alter skin structure

SKINFIBROMETER

UNIQUE INDENTATION INSTRUMENT FOR TISSUE INDURATION MEASUREMENTS



INDURATION MEASUREMENT



SkinFibroMeter measures force (N) against indurated subcutis

SKIN AND SUBCUTANEOUS INDURATION

Measuring tissue induration has been challenging with conventional devices that alter the measured tissue structure. Delfin has developed the portable SkinFibroMeter to eliminate this and to introduce a quick and practical induration measurement.

The SkinFibroMeter utilizes an indenter that is briefly pressed on the skin. The skin and especially the subcutaneous tissue resist the change in shape to external force of the indenter.

SKINFIBROMETER INSTRUMENTATION AND MEASUREMENT PRINCIPLE

The SkinFibroMeter consists of a 1.3 mm length indenter, a reference plate and related built-in force sensors. The device is briefly pressed against the skin and the contact pressure is registered. The indenter imposes a constant deformation when the reference plate is in full contact with the skin. The skin and the underlying upper subcutis resist the deformation and the induration value in Newtons (N) is determined.

The measurement principle is based on the analysis of the biomechanical response of the skin and subcutaneous tissue to external force. The response is mathematically modeled using 3D computational FE (Finite Element) analysis.

SKINCOLORCATCH

ADVANCED TECHNOLOGY FOR SKIN COLOR MEASUREMENTS



SKINCOLORCATCH

Skin colour measurements are widely used in both medicine and cosmetic industry. Erythema and melanin indices are indicators quantifying intensity of skin erythema and pigmentation. With traditional colorimeters erythema measurement is often affected by melanin and vice versa. These issues have been solved in the fully portable and pocket sized Delfin SkinColorCatch. The device also shows RGB, CIE $L^*a^*b^*$ and $L^*c^*h^*$ color coordinates and calculates automatically the ITA degree, which classifies the skin tone.

SKINCOLORCATCH INSTRUMENTATION AND MEASUREMENT PRINCIPLE

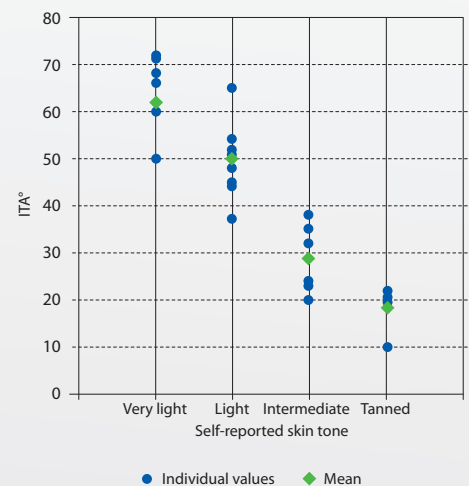
White LEDs corresponding to daylight are arranged circularly inside the measurement chamber of the SkinColorCatch. When the SkinColorCatch is gently placed on the skin, the LEDs illuminate the skin in the angle of 45 degrees to minimize gloss. The light reflecting back from the skin is detected with an RGB color sensor.

The measurement is not affected by ambient lighting conditions and the optical orifice of the SkinColorCatch is designed to minimize possible blanching effects caused by the contact pressure against the skin.

BENEFITS

- ♦ All-in-one colorimeter
- ♦ Melanin and erythema indices insensitive to each other
- ♦ Calculates ITA automatically
- ♦ Direct skin contact
- ♦ Calibration check tool included
- ♦ Portable and battery operated

ITA° AND SELF-EVALUATED SKIN TONE OF 30 CAUCASIAN SUBJECTS' FOREARM



BENEFITS

- Measures flat and small sites
- Semiconductor sensor, no risk of glass breakage
- No need of internal filling solution
- Easy sensor cleaning
- Measures also skin surface temperature
- Large display with background light
- Battery operated
- Designed for easy carrying



LAQUA

PORTABLE PH METER

Skin pH measurements indicate the acidity of the skin, which can be affected for example by skin diseases, aging, hormones and many substances.

LAQUA is a portable, hand-held, wireless pH/ORP meter for laboratories or for use on the field. It measures also the temperature of the skin.

The flat ISFET semiconductor electrode allows easy measurements

on the skin, the scalp or other non-liquid material. The electrode does not contain breakable glass and there is no need for internal filling solutions.

The LAQUA is waterproof, dustproof and shockproof. The measurement result is shown on the large display and wirelessly transferred to the Delfin Modular Core software.

DELFIN MODULAR CORE

SOFTWARE PACKAGE

All Delfin instruments can be used with the same data collection software. Measurement data may be collected wirelessly to the Delfin Modular Core (DMC) software.

The DMC software package includes the software, the wireless receiver unit to be plugged into the computer's USB port and the RoomSensor.



DMC SOFTWARE

The DMC software allows users to set up individual projects, store and view measurement data.

The data is saved into database files. One DMC project may be the whole research study or a single measurement session. Project information (subjects, sites and sessions) can be added in corresponding tables or copied from another project or template. Items can be added or deleted also during the study, but deleting is denied for items already associated with measured data.

The measured data can be exported into a CSV file for further analysis in Excel or other data processing software. The data can also be displayed and printed graphically in the DMC.

ROOMSENSOR

Knowing environmental conditions is important when performing skin measurements. The RoomSensor offers an easy way to document the relative humidity (RH) and the temperature of the measurement room during the measurement session.

The RoomSensor measures ambient RH (%) and temperature (°C or F) and sends the information wirelessly to the DMC software. The readings are displayed on the bottom bar of the software in real time and automatically stored with each individual measurement result.

SYSTEM REQUIREMENTS FOR DMC SOFTWARE

Operating system Windows 7, 8.1 (not RT) 10 and 11

USB 2.0 or higher 1 port

Software



RoomSensor

Receiver



WWW.DELFINTECH.COM

HEAD OFFICE

Delfin Technologies Ltd
P.O. Box 1199
70211 Kuopio, FINLAND
tel. +358 50 911 1199
info@delfintech.com

Worldwide distributors: www.delfintech.com