

User manual

Coating thickness gauge SaluTron® ComBi D3



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Congratulations on the purchase of our coating thickness gauge **ComBi-D3**.

Description

The **ComBi-D3** is a simple and cost effective measuring device. It belongs to a range of non-destructive coating thickness gauges.

Measuring ability of **ComBi-D3**:

Fe: all non-magnetic coatings such as synthetics, lacquers, enamels, copper, chromium, zinc, etc.	on <i>steel or iron</i>
NFe: all isolating coatings such as lacquers, synthetics, enamels, paper, glass, rubber etc.	on <i>copper, aluminum or brass. This includes anodized coatings on aluminum as well.</i>

It is easy and handy to use and allows the user to make all necessary adjustments with the aid of a menu (**MODE**-button). This allows for change to be implemented quickly and simply. The gauge **ComBi-D3** can be used for a wide variety of applications and has to offer a large measuring range from 0 to 3.5 mm. Modern electronic and the robust casing guarantee an extended lifetime for the high precision instruments.

Battery exchange

The **ComBi-D3** gauge is powered by a 9 V alkaline battery. The battery compartment can be found in the top back portion of the instrument. If a battery icon appears in the display, the battery has to be exchanged.

If a replacement battery is not available immediately, several measurements can still be taken until the gauge shuts down completely (the display shows **bATT** and a discontinuous beep tone is audible).

Attention: Exhausted batteries are hazardous waste. Used batteries not with the domestic waste decontaminate, but deliver at stated collective places.

Switching on and off of the device

- The gauge can be switched on manually via pressing of **ON/OFF**-button or by directly placing the probe on the measurement object.
- It appears **LD3** (name of device) and then the last measured value.
- The gauge switched off automatically after 40 seconds of non-use or by long pressing (about 3 seconds) of **ON/OFF**-button.

Handling and storage

The **ComBi-D3** gauge is a high precision instrument with a wide scope of applications. It is therefore of great importance that the device is handled with care to ensure a long life and a prerequisite for precise and accurate measurement results. The following guidelines are to be followed to achieve the above:

- Protect the device from dust and dirt.
- Do not drop the device to the floor.
- Protect the device from moisture, aggressive vapors and chemicals.
- After use please put the device in the carrying case.
- Avoid direct strong sunlight and temperature shocks as these can have a negative influence on the measurement result.
- Precise measurement results can be achieved only with a clean probe. Therefore, use regularly a clean, damp cloth.
- Check the probe regularly for soiling such as paint or iron particles.

- If the device is not used for a long time, it is advisable to remove the battery to avoid possible damage caused by the leakage of a battery.
- If the device has a failure, contact your supplier for help.

Taking measurements

- Hold the device vertically on the location to be measured.
- Place the probe flat (**avoid tipping!**).
- To get the best results, place the thumb on the elliptical indicated position with the other fingers behind the gauge for balance.
- A beep is audible and the measured value appears on the display.
- Improper placement, as well as picking up the device before the end of the measurement and the zeroing on a non-metallic surface (substrate) is displayed with **Er0** (error).
- If the coating thickness exceeds the maximum range (3500 µm) or if the device is placed on the incorrect substrate (wood, paper, cardboard etc), the display shows **InF** (infinite).
- The V-groove on the measuring head helps by measurements on round objects, such as rods, tubes, shafts, radii etc.

Please do not perform measurements on magnets and in magnetic fields. Magnetic fields influence the results by the Fe- and strong electromagnetic radiation has the influence by the NFe measurements.

Zero calibration

A zeroing of the instrument is necessary after switching on, by different measurement processes, inserting of new battery or after prolonged use.

Place the device on the iron- or the aluminum plate in the carrying case. You can also use a piece of uncoated ferro (Fe) or non-ferro (NFe) metal (substrate) used in your process. If the displayed value is out of the basic tolerance, the instrument has to be zeroed. The following steps are to be taken to zero the gauge:

- Remove the device from the zero plate or the substrate.

- Press the **Zero** button. The display shows **P0.0** (zero point).
- Place the gauge on the zero plate or the substrate. **Pln** (infinity) appears followed by a beep tone.
- Lift the device at least 5 cm from the zero plate. **0.0** appears followed by another beep.
- To check the zeroing place the gauge on the zero plate or the substrate again. **0.0** should appear on the display followed by beep. If the result is different repeat the zeroing procedure.
- The device is now ready for accurate measurements.

Note that it is not necessarily to receive the same displayed result by repeated measurements at the same location. Measurement variations can be caused by roughness, dirt or bumps.

The menu of ComBi-D3

The various options from the menu can be accessed by repeatedly pressing the **Mode**-button. Pressing the **Enter**-key allows to select the displayed option. Now the **Mode**-button change or select the setting. Pressing of **Enter** confirms your choice and exits the menu.

- rSF** - Resetting the average value (mean) of the measurements (**YES** - Yes, **no** - no)
- GAG** - Choice of substrate material
AUT - automatic detection (*recommended*) indicated by **AUTO** icon in the display
FE - only steel or iron
nFE - non magnetic metals (aluminum, copper etc.)
- ConT** - continuous measurement indicated by **CONT** icon in the display (**On** - On, **OFF** - Off)
- UnT** - Choice of measuring unit between microns / mm and mil (**25.4** - µm/mm, **1.00** - mil)
- bEP** - Switching on or off of tons keys (**On** - On, **OFF** - Off)
- Sn** - Displays the serial number of the device

Automatic detection for the measurement on ferro or non-ferro

The automatic detection of subsurface material (**Fe** - ferro or **NFe** - non-ferro) is indicated by the **AUTO** icon in the display. Before each measurement, the device checks the material and selects the corresponds measurement method. If the device is placed on magnetic material (ferro), **Fe** icon is indicated in the display. By measurements on non magnetic metals (non ferro), **nFe** icon is indicated in the display. The **GAG** option of the menu enables or disables the automatic detection.

Display of the average value (mean) and the number of measurements

The device calculates with each measurement and without storing of individual results the average value. The display of mean is due to the short press (less than 3 seconds) of the **ON/OFF**-button and is indicated with **Ave** (average) icon in the display. If the **ON/OFF**-button is short pressed again, the number of last measurements applied to the mean together with **n** icon appears in the display. The **rST** option of the menu resets these values.

Delivery

- Coating thickness gauge **ComBi-D3**
- Carrying case with two zero plates (steel and aluminum)
- 9 Volt battery (alkaline)
- user manual

Technical Specifications

Base material (substrate) steel or iron:	Fe
Non magnetic metals: such zinc, copper, brass, aluminum, stainless steel, anodized aluminum:	NFe
Continuous measuring range:	0 - 3.500 µm or 0 -140 mil
Display of measured values:	from 0.0 - 999 in µm from 1.00 - 3.50 in mm or from 0.00 - 140 mil
Display resolution:	0,1 µm in the range of 0.0 - 99.9 µm 1 µm in the range of 100 - 999 µm 0.01 mm in the range of 1.00 - 3.50 mm or 0.01 mil in the range of 0.00 - 9.99 mil 0.1 mil in the range of 10.0 - 99.9 mil 1.0 mil in the range of 100 - 140 mil
Repeatability (basic tolerance):	+/- (1,5 µm + 2%) from 0 - 1000 µm +/- 3,5% from 1.00 - 3.50 mm
Minimum object size:	10 x 10 mm ² or (0.4" x 0.4")
Minimum curvature: convex: concave:	5 mm or 0.02" 30 mm or 1"
Minimum substrate thickness: Fe: NFe:	0.20 mm or 8 mil 0.05 mm or 2 mil
Temperature range: Storing: Operating:	-10°C to +60°C (14°F to 140°F) 0°C to +60°C (32°F to 140°F)
Probes:	Single point
Power supply:	9 Volt E block alkaline
Dimension (LxWxH):	118 x 58 x 38 mm or 4.6" x 2.3" x 1.5"
Weight incl. battery:	approx. 150 g or 5.3 oz

The **ComBi-D3** corresponds national (DIN) and international (ISO, BS, ASTM) standards and have the CE mark.

DIN 50981, 50984
ISO 2178, 2360, 2808
BS 5411 (3, 11) 3900 (c, 5)
ASTM B499, D1400

Technical data subject to change without notification.