



# CAISSON

Measuring equipment

- If the instrument casing becomes dirty, then wipe it with a lightly dampened cloth. Do not use abrasive cleaners and solvents. Do not allow moisture to enter connectors, sensor or casing.

## 14. Power supply

The color meter is powered by two AA batteries. You may use either disposable or rechargeable batteries. The battery status indicates the battery charge level. If an empty battery icon is displayed, replace the batteries. Batteries should be replaced with a new set of batteries of the same kind. Do not use a rechargeable battery in combination with a disposable battery or a partially discharged battery with a full battery.



## 15. Specifications

### ENVIRONMENTAL EFFECTS:

Storage temperature: -30 to 55°C.

Operating temperature: 10 to 40°C.

Low and high ambient temperatures can affect the data display speed and color matching accuracy.

Do not expose the instrument to high temperature, do not leave it directly in the sun.

### MEASUREMENT ACCURACY:

The average color recognition basis of two results is 99,5%. For the first best fit the accuracy is approx. 95%. The device may not recognize unambiguously about 0,5% of the colors.

### BATTERIES:

Two 1.5 V LR6/AA-size alkaline batteries.

Power consumption during normal operation: 350 mW.

Lifetime (at room temperature): approximately 18 h.

### PHYSICAL CHARACTERISTICS:

Dimensions: 128 mm x 79 mm x 25 mm.

Weight: 162 g with or 116 g without batteries.



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## Color Meter FMG-30

### User manual

#### 1. Description of the instrument

Color meter enables measurement of the color intensity difference between a sample under examination and a specimen. Based on a selected color palette, the device's feedback information shows two colors most closely related to the sample under examination and CIE Lab color space values L\*a\*b or the percentage of the components of the sRGB color space. The instrument's vertical construction enables measurement of very small areas.



Figure 1.: Color meter, general view

#### 2. Measurement method

The color sensor and two electroluminescent diodes create a system based on a 45°/0° geometry. The sample's surface is illuminated at 45 degrees. The sensor is placed at 0 degrees parallel to the sample's surface. The sample's color is mapped out with dE2000, a color-difference formula based on the CIE Lab color space, which describes the numerical difference between the sample's surface color and reference.

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### 3. General information

|                          |                        |
|--------------------------|------------------------|
| Model                    | FMG-30                 |
| Illuminating system      | 45°/0°                 |
| Light source             | white LED              |
| Sample's minimum size    | 32 mm x 20 mm          |
| Power supply             | 2 x AA Batteries       |
| Dimensions               | 128 mm x 79 mm x 25 mm |
| Weight with batteries    | 162 g                  |
| Weight without batteries | 116 g                  |
| Work conditions          | 10°C to 40°C           |
| Storage conditions       | -30°C to 55°C          |

### 4. Contents

- Manual
- Guarantee
- Batteries

### 5. Available color palettes

Color meter enables measurement of a sample against the following color palettes: Ral Classic, Ral Effect, Ral Design, Sikkens 5051, NCS, Pantone, PPG The Voice of Color, PPG Chromatic, Caparol 3D System-PLUS, Unik'colors, Naé par Unikalo, Nuancier Colorimix, Ral Unikalo.

### 6. Initial settings of the instrument


When turned on for the first time, the instrument operates on the Ral Classic color palette. The instrument automatically turns off after 3 minutes of not being used. When turned on, the instrument operates on the previously used color palette, display mode and language.



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### 12. Turning the instrument of

- To turn the instrument off, press and hold down for 3 seconds , and then release the button. .
- The color meter turns off automatically within 3 minutes of not being used.
- If the battery charge is too low, an icon will pop up, showing a discharged battery and the instrument will turn off. The battery must be replaced

### 13. Maintenance and service

The FMG-30 is designed and constructed to provide many years of reliable operation. However, if a fault occurs that impairs the instrument's correct functioning, remove the batteries to prevent the risk of further damage. For more information about preventing faults or damage to your FMG-30, please read the Instrument Care section below.

### Warranty

Notwithstanding the statutory warranty claims, CAISSON provides a warranty in accordance with the laws of the Customer's country for a period of at least two years from the date of sale of the instrument to the end user. The warranty covers only those faults which are caused by defects in material or workmanship. A warranty claim must be accompanied by a proof of purchase with the date of sale specified. Warranty repairs shall only be performed by an authorized distributor of CAISSON. The following are excluded from the warranty:

- Use of force, damage caused by external factors or foreign bodies such as sand or water;
- Damage caused by failure to comply with the instructions for use;
- Normal wear and tear.

The warranty does not cover instruments that are partially or entirely disassembled.

### Instrument Care

- Protect the instrument from impact. Do not drop it or subject it to rough handling. Transport it in the supplied carrying case.
- Do not immerse the instrument in liquids
- Do not look directly at the measuring optics when the instrument is turned on.
- Never mix fresh and partially-used batteries.
- Protect the instrument from water, dust, extreme temperatures, high humidity and direct sunlight during storage and use.
- For long-term storage, remove the batteries. Do not leave discharged batteries in the instrument, as they may leak and cause damage.



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## 11. Making measurements

The sample to be examined should be dry and opaque. The samples can be placed horizontally (on the table), vertically (on the wall) or at an angle.

The colors matched by the instrument are for guidance only. Visually confirm that the color given by the instrument is similar to that of the sample. Depending on the environmental conditions, color identification may not be accurate. Final color confirmation should be based on the physical template.

This instrument contains a sensitive optical system that must be kept dry and dust free preferably at room temperature and in the case if not used. Clean it only with a microfiber cloth and gently blow off dust from the optical system. Any contamination may affect readings.

1. Turn the instrument on by means of
2. Select the desired color palette by means of the fast selection menu.
3. Place the instrument on the surface under examination. **Caution!** The part with the sensor must touch the surface with all edges.
4. To make a measurement, press the button "OK" . **Caution!** While making a measurement, take care that the instrument remains motionless.
5. After the measurement has been finished, the result will show in the display.
6. You can make another measurement by pressing "OK" .

When the measurement is complete, two color numbers will appear on the screen that best match the sample being tested.

Factors that may affect the measurement result:

- Optical system obstruction
  - Low or high temperature
  - Inappropriate use of the instrument
  - Measurement carried out incorrectly
  - The instrument was not stable
  - Contaminated sample
  - Uneven sample surface
  - A sample that changes appearance depending on the viewpoint
  - Metallic or husked dye content
- 
- Samples with extremely high brightness (can contain fluorescent pigments)



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## 7. Description of the instrument



Figure 2.: Front panel



Figure 3.: Backpanel

1. Menu navigation button for scrolling up.
2. Turn-on/off button or menu option confirmation.
3. Menu navigation button for scrolling down; if held down, it will rotate the display upside down.
4. LCD display that shows:
  - a) color closest to the sample under examination,
  - b) color second closest to the sample under examination,
  - c) L\*a\*b / RGB values,
  - d) currently selected color palette,
  - e) battery charge indicator.
5. Color sensor.
6. Battery holder.

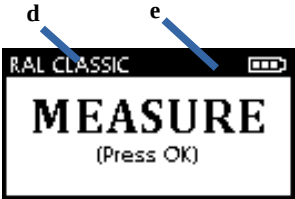


Figure 4.: Main display

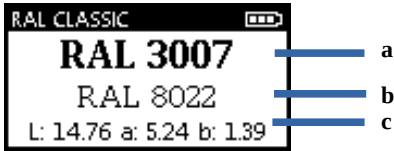


Figure 5.: Display with a measurement result



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## 8. Menu description

To enter the menu, press and hold down both ▲▼ for 3 seconds. To navigate through the menu, use ▲▼ to select the illuminated item, press “OK” (power button icon).

Menu options:

- Back,
- Multiple measure,
- Display mode,
- Color palette,
- USB,
- Language.

- **Back**

“Back” brings you back to the main display.

- **Multiple measure**

“Multiple measure” starts an alternative measurement mode. The results of subsequent measurements with measured L\*a\*b/RGB values are presented in the consecutive lines of the display, which allows for a simultaneous comparison of up to 4 samples. Pressing ▲▼ will deactivate the function.

| RAL CLASSIC |       |             |
|-------------|-------|-------------|
| 4.          | R:8%  | G:10% B:10% |
| 3.          | R:59% | G:19% B:15% |
| 2.          | R:57% | G:43% B:39% |
| 1.          | R:7%  | G:10% B:10% |

Figure 6.: Multiple measure



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- **Display mode**

“Display mode” enables changing values of measurement. Use ▲▼ to select L\*a\*b (CIE Lab color space values) or RGB (the percentage of the components of the sRGB color space).

| RAL CLASSIC |             |
|-------------|-------------|
| RAL 1014    |             |
| RAL 1015    |             |
| R:88%       | G:89% B:62% |

Bild 7.: RGB[%] values

| RAL CLASSIC |                   |
|-------------|-------------------|
| RAL 2002    |                   |
| RAL 3028    |                   |
| L: 49.81    | a: 59.32 b: 52.85 |

Bild 8.: Lab values

- **Color palette**

Use ▲▼ to change the color palette to which the measurement will be compared. You may choose between Ral Classic, Ral Effect, Ral Design, Sikkens 5051, NCS, Pantone, PPG The Voice of Color, PPG Chromatic, Caparol 3D System-PLUS, Unik'colors, Naé par Unikalo, Nuancier Colorimix, Ral Unikalo.

- **USB**

Enables connecting the color meter to a computer by means of a microUSB – USB

- **Language**

Use ▲▼ to change the language between German, Dutch, French, Italian, English, Czech or Swedish.

## 9. Quick selection of color palette

From the main window (Figure 4) or the measurement result (Figure 5) you can quickly change the current color palette. To see the list of available palettes, press one of the buttons ▲▼, select the desired element in the color palette and confirm with “OK” (power button icon).

## 10. LRV (contrast) measurement

The contrast between colors is based on the LRV value. From the main window (Figure 4) or the measurement result (Figure 5), you can start the contrast function. To activate the function, press the left button ▲ for a longer time. A message will appear with instructions on how to perform the measurement.