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Sharper vision,
better results.

CLM-196 – Laboratory Colorimeter Datasheet

CLM-196

Laboratory Colorimeter

Laboratory Colorimeter

The CLM-196 benchtop colorimeter enables spot color measurement of a wide range of production materials. This professional instrument, individually calibrated and temperature-compensated, is supplied with free application software. EOPTIS plans to continuously enhance this software by integrating new features based on specific requirements, which will be made available to all customers once development is complete.

CLM-196

Laboratory Colorimeter

Accurate, objective, daily monitoring of production.

- Practical color quality control, immediate, objective, and highly repeatable measurements;
- Sensitivity up to 60x greater than the human eye;
- Classification of measured products into batches;
- Reconstruction of the color to be produced.

CLM-196

Laboratory Colorimeter

Verify the color of raw materails and finished goods

Compare a color with a standard or custom database

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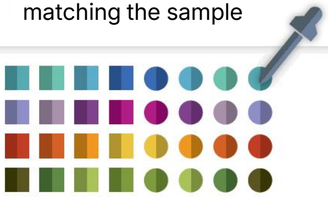
Measure the quality of your COLOR

Find the best color matching the sample



Attest your work quality with a report

Benchtop colorimeter with high reliability and long-term stability at an extremely competitive price

Conceived, developed and manufactured in ITALY

CLM-196

Type of materials

Cosmetics powders

Coffee

Seeds

Ceramic powders

Food liquids

Nail polishes

Fruit juices, pulps and mousses

Ice cream bases

CLM-196

Technical specifications

Color sensor	Based on the spectral value of the standard CIE 1931 color-matching functions (DIN ISO 13655 and DIN 5033)
Light source	Integrated white LEDs
Target type	Reflective (matte or glossy)
Working distance	Contact
Measurement geometry	(45°c:0°) according to CIE15:2004, ASTM E1164
Repeatability	0.03 ΔE*ab typ (30 measurements at 5s on white reference)
Illuminants	D65, D55, D50, A, C, FL2, FL7, FL11
Observers	CIE-1931 2° e CIE-1964 10°
Measurement area	∅ 10mm (standard)
Dimensions	74 mm (H) x 100mm (Ø)
Power	USB self-powered
Weight	940 g

CLM-196

Functional specifications

Color coordinates	CIE L*a*b, CIE XYZ, CIE L*u*v, CIE L*C*h, Yxy, sRGB, Yellowness Index, Color name.
Color differences	DeltaE*ab, dL* da* db* dC*, dX dY dZ, dL* du* dv* du*v*, dL* dC* dh, dY dx dy dxy, dR dG dB, dy
Acquisition mode	Software-triggered, single or multiple readings.
Recipe management	Ability to save parameter setups as “projects”
Report generation	Customizable reports with company logo, for analysis and history, in .pdf and .xml formats (Excel-compatible)
Database creation	Storage of measurement sequences and reference sequences
Advanced functions	Multiple measurement Average calculation of a set of measures or references Continuous measurement Creation of custom color spaces from a specific formulas

Accessories

Standard configuration

With «CLM-196.Tran»

With «CLM-196.Solid»

The standard configuration of the CLM-196 allows the measurement of powders, granules, and non-transparent liquids.

The CLM-196.Tran accessory consists of a dedicated eyepiece that screws onto the instrument body, together with several mechanical components that fit into the sample cup. This configuration allows the measurement of the color of transparent or semi-transparent liquids.

The CLM-196.Solid accessory consists of a dedicated eyepiece and enables the measurement of solid samples placed directly on top of the instrument.

Factory calibration and report documents

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Certificate of traceable calibration

Certificate No.	24290023 - 2530
Calibration Item	CLM-196 Benchtop Colorimeter
Serial Number	24290023

This certificate is provided for the Tristimulus Colorimeter listed above to confirm that said colorimeter has been calibrated against Eoptis' calibration standard tiles, which are traceable to the Research Institutes of Sweden AB (RISE), following the calibration procedure described hereafter by qualified and trained person(s) of Eoptis.

Calibration Procedure

The calibration procedure is based on 24 ceramic tiles by Mount Baker Research L.L.C.. These tiles, adopted by Eoptis as calibration standard, have been calibrated by means of a Konica-Minolta CM-508C spectrophotometer under (45°/0°) geometry. The last calibration process is dated June 5th , 2023.

The procedure adopted for tiles calibration [1] relies on a kit of 12 colored tiles from CCS series II coded as MU94, a ceramic white reference tile coded as MW94 and a black reference tile coded as MY94. The Spectral Radiance Factors (SRF) were measured and are traceable to the Research Institutes of Sweden AB (RISE). The estimated 2σ (95% confidence level) absolute accuracy of the certified Spectral Radiance Factors of the 24 ceramic tiles is 99.2% ± 0.3%.

Tristimulus Values computed from SRF under defined Standard Illuminant and Observer pairs have been used to match the raw data of the Colorimeter by means of an Eoptis' proprietary algorithm. Raw data for the 24 tiles have been acquired by the Colorimeter under calibration by averaging the data from a sequence of 4 consecutive acquisitions with 5 second delay interval. Measurement aperture of the Colorimeter is placed at the center of the tile to within ±0.5mm accuracy.

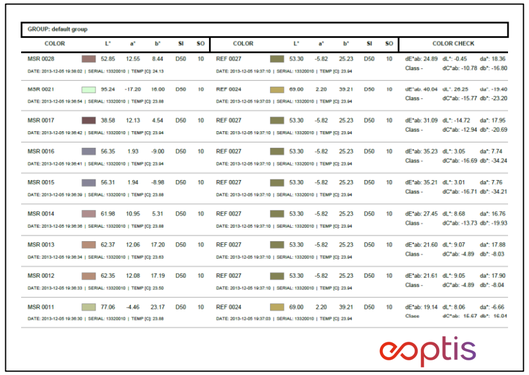
After calibration, by means of the same procedure described above, the Tristimulus values for the C.I.E.L*a*b* color space of the tiles have been acquired by the colorimeter and compared with the certified values to assess the system performance. Repeatability is also tested, based on 30 replicate measurements of the White Reference Standard supplied with the Colorimeter (matching serial number) at 5 second intervals without replacement or recalibration. Mean value has been set as reference to compare deviations. Results are listed in the following performance report for D65 Illuminant, 2° Observer.

Place and date of Calibration: Trento - July, 24th 2025
Recommended calibration interval: 1 year

Certified by
Luca Clementel - Technical Manager

References

[1] CENTROCOT – Accredited Calibration Laboratory - Certificate of Traceable Calibration LAT 226 N.23RA07746



GROUP: default group

COLOR	L*	a*	b*	SI	SO	COLOR	L*	a*	b*	SI	SO	COLOR CHECK
MSR 0028	52.85	12.55	8.44	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 24.89 dL*: -0.45 da*: 18.36 Class - dC*ab: -10.78 db*: -16.80
MSR 0021	95.24	-17.20	16.00	D50	10	REF 0024	69.00	2.20	39.21	D50	10	dE*ab: 40.04 dL*: 26.25 da*: -19.40 Class - dC*ab: -15.77 db*: -23.20
MSR 0017	38.58	12.13	4.54	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 31.09 dL*: -14.72 da*: 17.95 Class - dC*ab: -12.94 db*: -20.69
MSR 0016	56.35	1.93	-9.00	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 35.23 dL*: 3.05 da*: 7.74 Class - dC*ab: -16.69 db*: -34.24
MSR 0015	56.31	1.94	-8.98	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 35.21 dL*: 3.01 da*: 7.76 Class - dC*ab: -16.71 db*: -34.21
MSR 0014	61.98	10.95	5.31	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 27.45 dL*: 8.68 da*: 16.76 Class - dC*ab: -13.73 db*: -19.93
MSR 0013	62.37	12.06	17.20	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 21.60 dL*: 9.07 da*: 17.88 Class - dC*ab: -4.89 db*: -8.03
MSR 0012	62.35	12.08	17.19	D50	10	REF 0027	53.30	-5.82	25.23	D50	10	dE*ab: 21.61 dL*: 9.05 da*: 17.90 Class - dC*ab: -4.89 db*: -8.04
MSR 0011	77.06	-4.46	23.17	D50	10	REF 0024	69.00	2.20	39.21	D50	10	dE*ab: 19.14 dL*: 8.06 da*: -6.66 Class - dC*ab: -16.47 db*: -16.04

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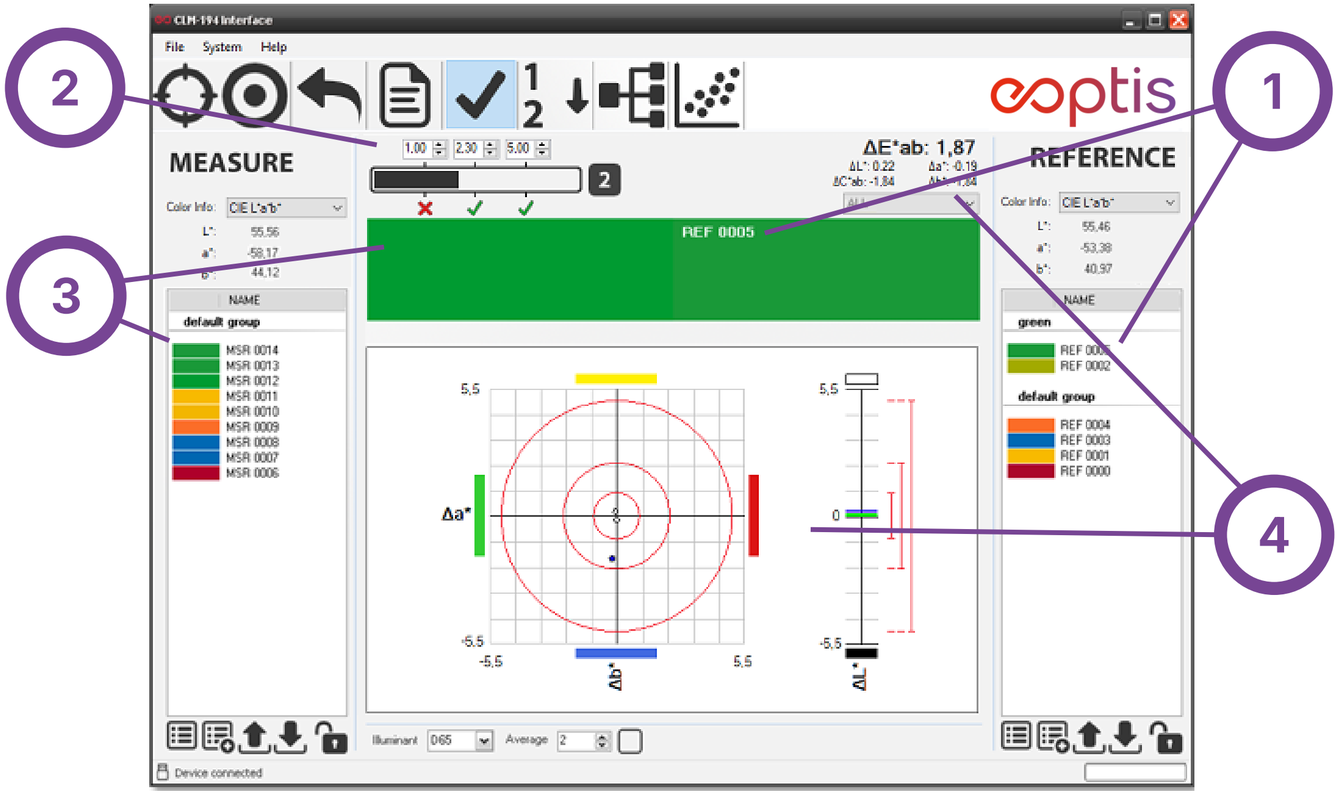
Factory calibration

Each device leaves our laboratories only after undergoing a complete calibration process. Thanks to our proprietary algorithms and procedures, we guarantee absolute accuracy and highly repeatable color measurements. The reliability and stability of these measurements are ensured for 12 months.

Report documents

Measurement results can be exported in PDF format, with the option to include the company logo, or in editable XML format for further analysis and processing.

«CLM19X Interface» application software



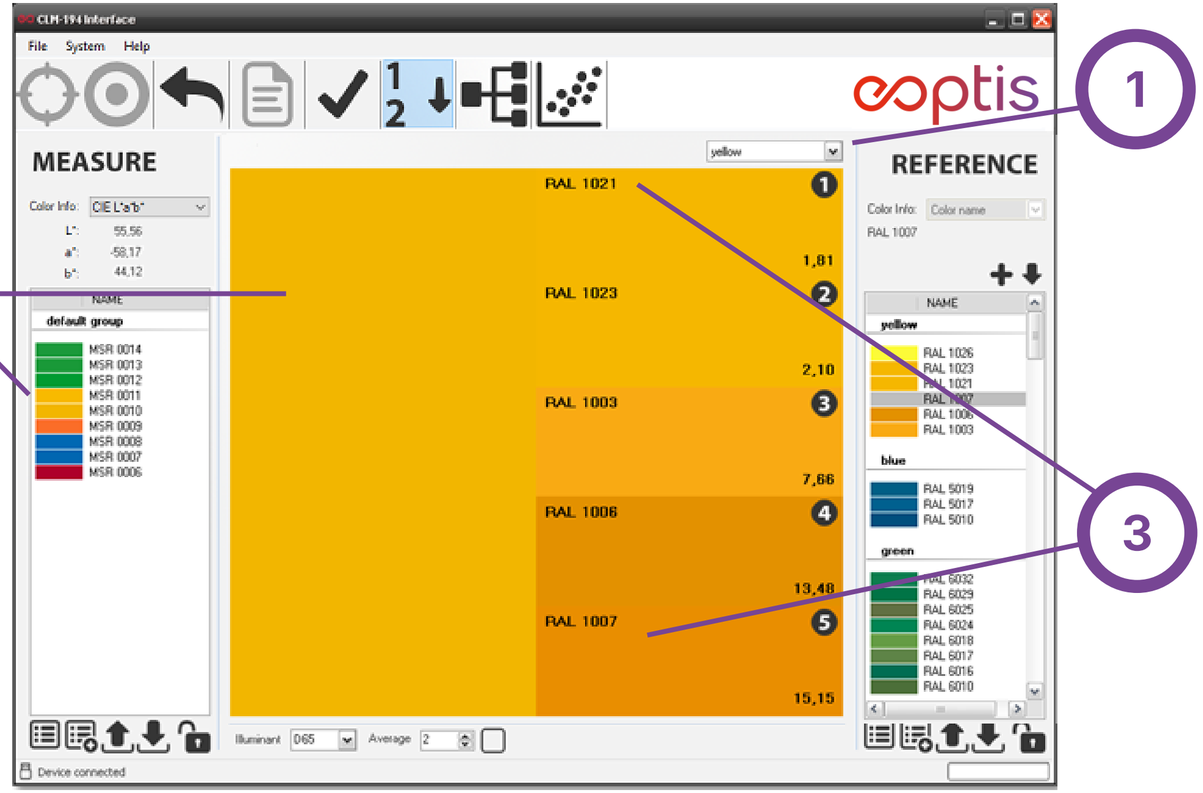
"Check Color Difference" feature

This function is used to determine the difference between two samples.

Procedure

1. Select a reference from a database or measure a reference sample
2. Set the tolerance thresholds
3. Measure the sample of interest
4. Check the difference using the graph and the tolerance level.

«CLM19X Interface» application software



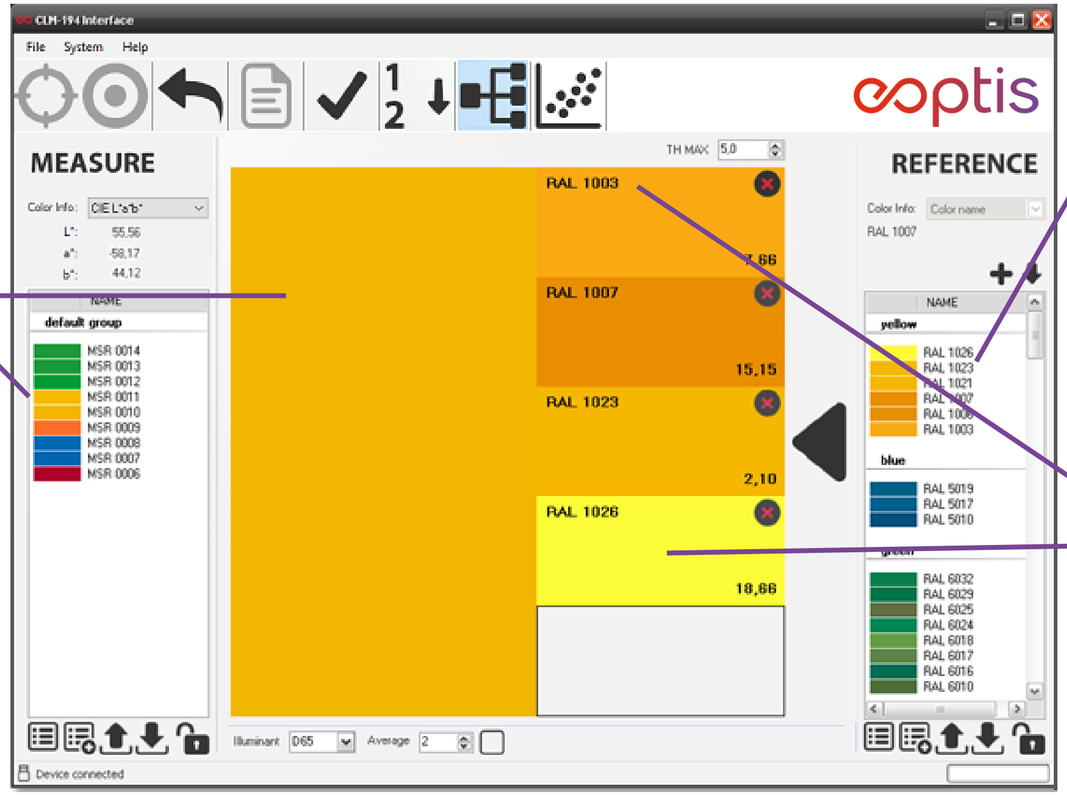
«Color matching» feature

This function is used to identify which color in the database is closest to the sample of interest.

Procedure

1. Select the database to reference
2. Measure the sample of interest
3. Review the five best matches, ranked from most similar to least similar.

«CLM19X Interface» application software



«Color classification» feature

This function is used to group measurements into homogeneous color categories.

Procedure

1. Select up to 5 colors from the reference acquisitions. Each of the 5 colors defines a class
2. Measure the sample of interest.
3. Verify which class the measured sample belongs to.

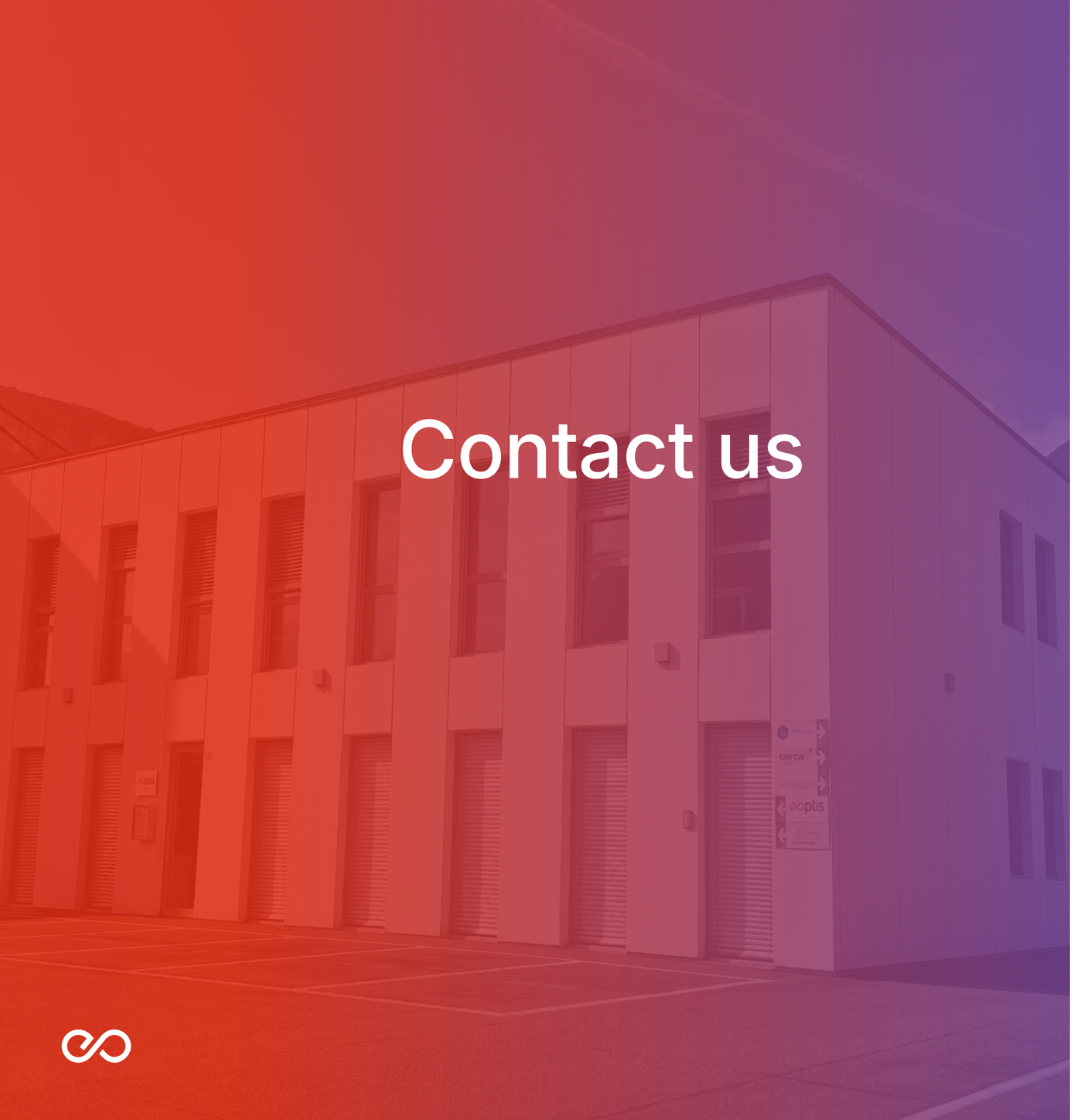
Standard equipment and accessories

Standard equipment

- CLM-196 Benchtop Colorimeter
- “CLM19X Interface” application software
- Calibration certificate with RISE traceability
- White calibration target
- 1 optical glass sample cup
- Rigid, watertight carrying case with molded interior.

Accessories

- Transparent liquids kit «CLM-196.Tran»
- Solid parts kit «CLM-196.Solid»



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