LensColor Analyzer TFM-1

The TFM-1 acquires the spectral characteristics of ophthalmic lenses with refractive power of up to ± 20 diopters. The lens transmission is measured over the wavelength range of 280 to 780nm. The color values L*a*b*, the UV transmission T_{UV} 380nm and T_{UV} 400nm and the light transmission T_V are determined in accordance with the DIN EN ISO 8980-3 standard. Furthermore, the values are displayed and saved to a database.

The system was developed in cooperation with Rodenstock GmbH, Munich, Germany.

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Applications

The LensColor Analyser TFM-1 was designed and developed for the use in dye bath development, in production of lenses for stock, and in realization for customer specific ophthalmic sunglasses.

The transmission of other optical components e.g. filters can be measured of course, as well.

Instrument Hardware

The main parts of the TFM-1 are the illumination unit, the sample holder, and the optical receiver unit. The sample holder is easily accessible at the front side of the instrument. Lens with diameters of 30 to 100mm and various refractive powers fit into the same holder for simplified handling.

A Xenon flash lamp with very high lifetime and a wide spectral range is used for illumination. Special optics form a quasi parallel light beam, 8mm in diameter, to acquire data over a relatively large spot.

The transmitted light is detected by means of a high-grade spectrometer module from Carl Zeiss. Due to their robust design, these devices provide an outstanding reproducibility; no recalibration of the wavelength scale is required.

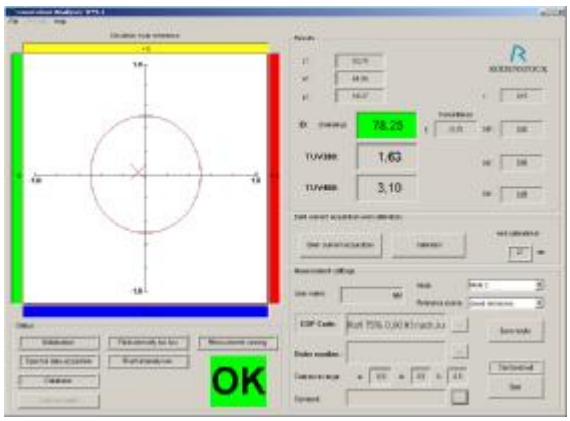
To obtain the transmission values with the necessary accuracy, a second spectrometer module simultaneously measures the optical power of each individual flash, for perfect referencing.

The operation of the measurement system as well as the transmission of the acquired data to a host computer is done via a USB interface.

Application Software

The included software is transparent in structure and easy to use.

The software controls the measurement procedure, processes the acquired spectral data, displays the results graphically and numerically, and archives the measured values.



User interface TFM-1 software

Two user levels are available:
The first - general user - level allows the performance of all necessary measurement procedures.

The second - administrator - level is secured by password and allows to set and/or change parameters for the measurement procedure respectively to control the principal funtions of the system.

Processing and Archiving of Measured Data

The colorimetric values are determined from the transmission data acquired by the TFM-1. The graphic display of the deviation of the colour values a* and b* from the given references, as well as the display of the tolerance range allows a fast and easy judgment of the production status.

The reference data can be acquired by measurement, can be selected from the database manually or automatically by means of the integrated look-up function.

The measured data can be saved to the database with the related order number. Therefore, a well defined assignment between individual order and production is maintained, providing a flawless documentation of the production process.

An SQL database is provided for total archiving, with several measurement systems accessing one central database.

Accessories

A barcode scanner, available as an option, allows the automatic entering of the order number. This significantly speeds up the whole measurement procedure and data storage, especially during production.

Technical Data

Samples

Lens types:	plano, single, bifocal, multifocal
Radii/refr. power:	- 20 dpt to + 20 dpt
Thickness:	0.5 – 15 mm
Diameter:	30 – 100 mm

Features

Spectral range:	280 - 780 nm
Spectral resolution:	5 nm
Spectral accuracy:	< 0.2 nm
Transmission range:	5 - 100%
Transmission resolution:	0.5%
Transmission accuracy:	< ± 0.3%
Measurement time:	1.5 sec
Class of protection:	IP50

Colour Values

L*a*b* (D65)

UV transmission T_{UV} 380 and light transmission T_V in accordance with DIN EN ISO 8980-3

UV transmission T_{UV} 400 following the DIN procedure

Reproducibility L*a*b*: < ± 0.1

Instrument

Dimensions

Height:	540 mm
Width:	220 mm
Depth:	300 mm
Weight:	15.5 kg
Operating temperature:	10 - 40°C
Storage temperature:	0 - 60°C

Power supply

Voltage:	100 - 230 VAC
Frequency:	47 to 63 Hz
Power:	max. 100 W
Fusing:	2A slow blow

Interface

USB Port:	2.0 (1.1 compatible)

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