

ASSESSING COLOR SCALE



www.grabner-instruments.com

**AUTO COLOR
MINICOL**

AUTO COLOR

Fully automatic, portable color VIS spectrometer

AUTO COLOR offers a worldwide unrivalled range of measuring color scales. The instrument was specifically designed for the color analysis of Gasoline, Diesel and petrochemical products. The unmatched accuracy, repeatability and reproducibility of the results due to the flexibility of the adjustable cell and the measurement of the full spectrum, provide objective and reliable color data according to all major petrochemical industry scales.

Opposed to a filter instrument, the AUTO COLOR is a full range spectrometer with a holographic grating and a 256 pixel linear array detector for highest precision for a wide range of products. Like no other instrument AUTO COLOR allows the user to measure liquids according to a variety of preconfigured color scales – or to design a user-specific color scale.



Key Features

One for All: Highest accuracy for all major color scales, dyes & markers

- ASTM Color (ASTM D 1500, D 6045)
- Saybolt Color (ASTM D 156, D 6045)
- Gardner Color (ASTM D 1544)
- IP 17/52 Method A+B
- CIE Values (ASTM E 308): Chromaticity Coordinates, CIE-Lab, CIE-Luv
- Lovibond® Tintometer® color scale (AOCS Cc13e-92)
- Solvent Yellow 124 "Euomarker" for Diesel
- Solvent Red 164 in Diesel (ASTM D 6258)
- Sudan® M Red 462 in Diesel
- Trace Red Dye in Jet Fuel
- Black Dye in marine fuel
- Also available upon request: Blue, green, black and many other dyes

Automatic, portable and easy to use

- Fully automatic cell cleaning, sample introduction, cell path length adjustment
- Results display on the large LC graphic display within seconds, with spectral display or printout on an optional PC or printer (RS232)
- Total visible spectrum measurement
- Adjustable sample cell 1 - 100 mm
- Small, portable and rugged for field application
- Optional 6 Position Auto Sampler

TECHNICAL DATA

Wavelength Range	385 - 725 nm	Sample Throughput	15 samples per hour
Resolution	9 nm	Measuring sample volume	6 mL
Path Length Range	0 to 100 mm	Rinsing sample volume	9 mL
Repeatability according to standards	ASTM Color: < 0.10 (D6045) Saybolt Color: < 0.14 (D6045) Solvent Red 164 (1 mg/L): < 0.18 Gardner Color: < 0.06 units	Power Supply	100/120/230/240 V, 50/60 Hz, 67 W
Reproducibility according to standards	ASTM Color: < 0.48 (D1500) Saybolt Color: < 1.24 (D156) Solvent Red 164 (1 mg/L): < 0.77 Gardner Color: < 0.5 units	Field Application	12V/10 A DC (vehicle battery)
Measuring Time	1 second	Dimensions	W x H x D: 200 x 320 x 180 mm (7.8 x 12.8 x 7.1 inches)
Turnaround Time (depending on scale)	4 minutes	Weight	8 kg (17 lbs)

MINICOL

One button color analysis by filter photometer

MINICOL is a milestone in color scale testing: The fully automated tristimulus filter colorimeter MINICOL was specifically designed to offer precise color measurement of various liquid petroleum samples. MINICOL comes factory calibrated to measure color according to all major industry scales.

Unlike common colorimeters MINICOL doesn't require on-site calibration. This means no reference liquids or colored glass standards: The instrument is fully calibrated and ready to measure with all standard values stored in a reference database.

Measurement is done easily and fast due to the true one-button-analysis operation, an intuitive graphics display and simple menu navigation.

MINICOL combines the key qualities of all Grabner Instruments products: It's a smart solution, packed in a small instrument, producing great results.



Key Features

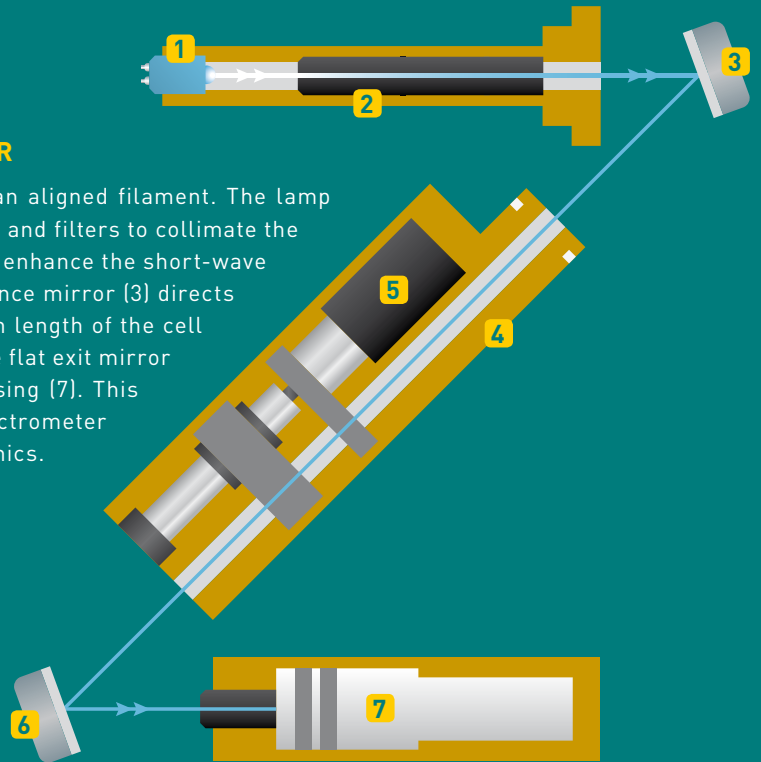
- ASTM Color (ASTM D 6045, equivalent ASTM D 1500 and DIN ISO 2049)
- Saybold Color (ASTM D 6045, equivalent ASTM D 156)
- Platinum-Cobalt (Pt-Co) Color (ASTM D 5386, equivalent ASTM D 1209, ASTM D 1686)
- CIE Values (ASTM E308)
- Microcontroller based
- Factory calibrated - no further calibration necessary
- True one-button analysis
- RS 232 & USB interface
- Results in less than 30 seconds
- Simple and small
- Cost efficient

TECHNICAL DATA

	SAYBOLT (ASTM D156, D6045)	ASTM COLOR (ASTM D1500, D6045)	PT-CO COLOR (ASTM D1209, D1686, D5386)
Range	-16 to +30	0 to +8	0 to 30 or 500
Repeatability	< 0.14	< 0.1	< 0.9 (0 to 30) / < 5% of value (above 30)
Reproducibility	< 1.24	< 0.48	< 2 (0 to 30) / < 10% of value (above 30)
Turnaround Time	< 30 seconds		
Sample throughput	120 samples per hour		
Interfaces	RS 232, USB and PC-keyboard interface		
Power Supply	Universal AC Input, 90-260V, 47-63Hz, max. 110 W		
Dimensions	W x D x H: 325 x 250 x 170 mm (12.8 x 9.8 x 6.7 inches)		
Weight	6.5 kg (14.3 lbs)		

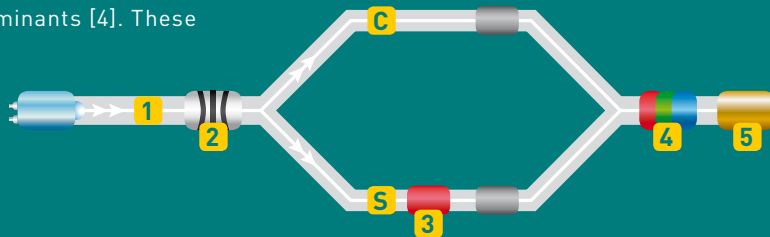
■ MEASURING PRINCIPLE OF AUTO COLOR

The light source is a halogen lamp (1) with an aligned filament. The lamp sits in a lamp housing (2) that contains lenses and filters to collimate the beam, suppress infrared (heat) radiation, and enhance the short-wave (blue) part of the emitted light. The flat entrance mirror (3) directs the light to the transmission cell (4). The path length of the cell can be adjusted with the driving motor (5). The flat exit mirror (6) directs the light to the spectrometer housing (7). This housing contains the collimating optics, the spectrometer with the CCD detector, and the readout electronics.



■ MEASURING PRINCIPLE OF MINICOL

The MINICOL principle for color testing is simple and smart: A sample is poured into the glass sample container [3] and the container is placed into the light path [1] of the automatic instrument. A transmittance measurement is performed in order to determine the CIE tristimulus values (under CIE Standard Illuminant C and the CIE 1931 Standard Observer) of the sample in question. Light passes through a series of standard filters [2] and is then split into two paths, a sample path [S] and a control path [C], used to compensate for any color or intensity drift of the source. CIE tristimulus values of the sample in question are determined by integration over selected illuminants [4]. These are then converted by the appropriate algorithm into a value on the Saybolt or an ASTM color scale [5].



G **GRABNER**
INSTRUMENTS
an **AMETEK** company

Grabner Instruments
Messtechnik GmbH
A-1220 Vienna/Austria
Dr. Otto-Neurath-Gasse 1
Phone +43/1/282 16 27-0
Fax +43/1/280 73 34
info.grabner-instruments@ametech.at
www.grabner-instruments.com