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GretagMacbeth™

COLOR-EYE® 2180
COLOR-EYE® 2145
QUICK OPERATION MANUAL

Technical Publication No.:
CBH1-CE2145/CE2180/1.0-97-10
Issued: June 1997
Part No. 17800060

INTRODUCTION.

The benchtop Color-Eye 2145 and benchtop Color-Eye 2180 are spectrophotometers that measure reflectance at every 10 nm from 360nm to 750nm. The Color-Eye 2145 uses 45/0 illumination geometry. The Color-Eye 2180 uses sphere illumination geometry.

SAFETY INSTRUCTIONS



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature that accompanies the unit.



The lightning flash with arrowhead, enclosed within an equilateral triangle, is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure. This voltage may be of sufficient magnitude to constitute a risk of electrical shock.

- PLEASE READ AND FOLLOW INSTRUCTIONS—Read and follow all safety and operating instructions before you attempt to install and operate this unit.
- RETAIN THIS MANUAL FOR FUTURE REFERENCE—Once you have read this manual, keep it handy for others to read or refer to when they need to operate the unit.
- OBEY WARNINGS—Please comply with all warnings and safeguards that we provide in this manual. They have been written to keep you and your unit safe.
- CHOOSE PROPER POWER SOURCES—This product should only operate with the power specified in the Electrical Requirements section of this manual.
- DO NOT OVERLOAD CIRCUITS—Do not overload wall outlets or use extension cords with this unit. This can result in a risk of fire or electric shock. Overloaded AC outlets and extension cords are dangerous, and can also affect performance. Periodically examine cords to make certain that they are not damaged, cracked or severely twisted during operation. Cords that show any signs of damage or wear should be replaced immediately.
- PROTECT FROM WATER AND MOISTURE—Maintain electrical safety when you use this unit. Do not use it in an area where there is possible hazard of electric shock from spilled water or other liquids or uncontrolled moisture.
- CLEAN PROPERLY—Make certain to unplug the spectrophotometer before you attempt to clean it. Do not use liquid cleaners or aerosol cleaners on your unit. Such cleaners may not be compatible with the painted surfaces, and may actually damage the optics. Use only a slightly damp, lint-free cloth to clean the surface of the unit. Do not attempt to clean the inside of the viewport or the unit itself.
- DO NOT FORCE OBJECTS INTO THE PRODUCT—Never push objects of any kind into the viewport or interior of the unit in an attempt to clean them or to mop up spilled liquids that may have entered these areas. If spills should occur that enter the unit, turn the unit OFF immediately, and contact a GretagMacbeth Service Representative to determine the best way to handle clean-up, drying, and return to the factory for damage assessment.
- THIS DEVICE IS *NOT* EXPLOSION-PROOF and should *not* be used in a hazardous atmosphere where it may be exposed to flammable substances.
- USE CAUTION AFTER POWERING OFF THE UNIT—Your instrument contains components that have a high voltage charge after the unit is powered off. The unit should be opened only by a GretagMacbeth authorized service agent.

SPECIFICATIONS

	CE 2145	CE 2180
Electrical Requirements	**Power consumption: 30 watts**	**Power consumption: 30 watts**
	120 VAC ± 10% or 230 VAC ± 10% 50 - 60 Hz	**120 VAC ± 10% or 230 VAC ± 10% 50 - 60 Hz**
Environmental Requirements	**Operating Temperature: 60°F to 90°F (15°C to 32°C) Operating Relative Humidity 0% to 90% (Noncondensing)**	**Operating Temperature: 59 to 90 F (15° C to 32° C) Operating Relative Humidity 0% to 80% (Noncondensing)**

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CALIBRATION AND OPERATION

With the spectrophotometer properly installed using the guidelines set forth in “SPECIFICATIONS”, calibrate the instrument using the calibration procedure described below.

Calibration Procedure

1. Connect the power cord and communications cabling.
2. Power ON the unit.
3. Set up and run the GretagMacbeth software program that you want to use.
4. *Color-Eye 2180 users only:* Select the desired specular component configuration.
5. Place the calibration tile with its white side facing the unit so that it completely covers the viewport opening.
6. Use the GretagMacbeth software program to cue the white tile calibration.
7. After calibration return the white tile to its storage area.
8. *Color-Eye 2180 users only:*
   a. Open the sample holder completely.
   b. Use the GretagMacbeth software program to cue the open port calibration.

Measurement Procedure

1. After calibration is complete, place the sample facing the unit so that it completely covers the viewport opening.
2. Use the GretagMacbeth software program to initiate the measurement.
3. Remove the sample from the unit.

CLEANING AND MAINTENANCE

Cleaning the Instrument

Maintain full electrical safety when you clean the instrument by unplugging the unit (if connected to an AC/DC converter) and disconnecting it from all cabling to other equipment such as the personal computer. Use only a slightly damp, lint-free cloth to cleanse the surface of the unit. Do not attempt to clean the inside of the viewport or the inside of any other part of the spectrophotometer. Cleaning the inside of the instrument should be done only by an authorized Factory Service Representative.

Cleaning Calibration Tiles

Ceramic standards (calibration tiles) are widely used in color science as standards of reflectance factor. Their principal virtue is the stability of their reflection properties. If they are to serve their intended purpose, it is necessary that the surface be kept clean and damage-free. The cleaning of any precision optic risks degrading the surface. Therefore, the need for cleaning should be minimized by returning the tile to its storage case or covering it with a protective bag when it is not in use. If cleaning is required, the following procedure is recommended:

Materials Required

Camel’s-Hair brush: Available at hardware stores.

Distilled water: Available at the pharmacy.

Isopropyl alcohol: Spectroscopic grade.

Soap: Ivory® brand soap or any non-moisturizing bar soap.

Dust Free tissue: Use a lens tissue which meets Federal Specification NNN-P-40A, Type I or equivalent.

CAUTION

Make certain that your hands are clean before handling the tile. Do not touch the white surface of the tile with the fingers while you are cleaning it. Natural oils, creams and other materials found in the hands can alter the optical properties of the tile and can result in an inaccurate calibration.

Lint and other small particles are usually best observed by illuminating the tile with a diffuse light source that does not produce surface glare. Inspect the tile at a sharp angle rather than looking directly at the tile's front surface.

1. Brush the tile surface with a camel's-hair brush.
2. Breathe a light mist of condensed vapor on the tile. Immediately wipe lightly with lens tissue. Avoid smearing the tile with natural greases from the hands by wiping with the untouched center part of the lens tissue.
3. After the tile has been wiped, inspect it again. If it is clean, STOP. If any smears remain, proceed as follows:
   a. Wet the center of the tile with isopropyl alcohol. DO NOT USE RUBBING ALCOHOL.

> **CAUTION**
>
> Never use cleaning solutions that contain abrasives. Use of abrasives or physically scraping the tile can change the surface reflectance values. This will invalidate calibration.

   b. Wipe the tile lightly with lens tissue.
   c. Dust with a camel's-hair brush to remove any remaining paper fibers.
   d. Breathe a light vapor mist on the tile, and wipe it lightly with lens tissue.
   e. Inspect the tile for remaining smears. Repeat if necessary. If foreign matter persists, proceed as follows:
      (1) Wet fresh lens tissue with distilled water, and rub on bar of Ivory® brand soap.
      (2) Wipe the center of the tile with soapy tissue to remove the matter.
      (3) Rinse the tile with hot tap water and then with cold distilled water. Apply this method only when necessary to remove something from the area actually involved in measurement.

Spare Parts: *Consult your Price List for additional information or call your local GretagMacbeth sales office..*

Color Tile Set 6 **P/N 59006170**
Set of six 2" by 2" GretagMacbeth Tiles: white, mid-gray, deep gray, yellow, green, and cyan.

Color Tile Set 13 **P/N 59006870**
Set of thirteen 2" by 2" GretagMacbeth Tiles: white, mid-gray, deep gray, yellow, green, cyan, pale gray, difference gray, deep pink, orange, difference green, red, and deep blue.

BCRA Tile Set. **P/N 59001030**
Set of twelve 2" by 2" GretagMacbeth Tiles: pale gray, difference gray, deep pink, orange, green, cyan, mid-gray, deep gray, red, bright yellow, difference green and deep blue.

Small Area View (SAV) Plate (CE 2180 only) **P/N 23008262**

TECHNICAL PUBLICATION No. CBH1-CE2145/CE2180/1.0-97-10
ISSUED: June 1997 Part No. 17800060

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