


GretagMacbeth

Visual Color Communication

Product and Resource Guide

COLOR MAKES THE DIFFERENCE

 **GretagMacbeth™**



SpectraLight® III Color Viewing Booth

► Make critical color decisions with the world's most accurate daylight simulation

The **SpectraLight III** color viewing booth uses GretagMacbeth's patented filtered tungsten halogen light source to give you the world's most accurate simulation of natural daylight.



It features six different light sources:

- Daylight (your choice of D75, D65 or D50)
- Illuminant A (home lighting) tungsten halogen
- Horizon daylight
- Ultraviolet (two levels)
- Cool White Fluorescent
- Your choice of TL84 or U30

Ultraviolet can be used alone or in combination with other light sources for the detection and evaluation of optical brighteners, whitening agents, or fluorescent dyes and pigments.

The booth's interior is made from a low gloss, neutral-gray (Munsell N 7/ standard) material to eliminate color viewing errors.

Available in either booth or single, dual and multiple overhead luminaire configurations, SpectraLight III features our *SmartLogic* software for accelerated throughput with faster color approvals. Using the booth's digital display, you can easily program a sequence of different light sources for hands-free viewing, maximizing operator efficiency and productivity.

An automatic energy-saving mode extends lamp life. And an easy-to-read elapsed-time meter reminds you when it's time to replace a lamp. User-adjustable color temperature permits convenient one-button calibration. This enables you to self-certify your viewing booth when used with a traceable spectroradiometer, saving your company recertification costs.

The **SpectraLight III** exceeds all major national and international standards governing daylight simulation quality and viewing conditions.

These include:

- ASTM D1729 for visual evaluation of color differences of opaque materials
- ISO 3664 for viewing color reproductions
- DIN, ANSI, and BSI standards
- CIE Publication 51
- BS950
- QS 9000
- SAE J361
- JIS Z 8723
- GM 9220P
- AS 4004

Dimensions

	Booth	Luminaire
Height	27.5"	9.5"
Width	37.1"	37.1"
Depth	24.4"	25.7"
Weight	154 lbs.	92 lbs.
Shipping Weight	194 lbs.	107 lbs.

Selecting Light Sources to Industry Standards

Light source	Application	Standards
D75 North Sky Daylight at 7500K	Opaque materials Cotton classing Diamond grading	ASTM D1729 ASTM D1684-90 GIA Gem Trade Laboratory D-Z grading system
D65 Average North Sky at 6500K	Visual correlation with spectrophotometric readings Interior and exterior automotive trim	Japanese and European BS950, AS 4004, JIS Z 8723, DIN 6173, GM 9220P, QS 9000 SAE J361, Detroit Color Council Bulletin No. 3
D50 Noon Sky Daylight at 5000K	Graphic arts	ANSI PH 2.30, ISO 3664

The Judge® II and The Judge® II-S

► Make accurate color decisions anywhere, anytime

The **Judge II** and **II-S** achieve the closest match to natural daylight available in a fluorescent source, with the best Color Rendering Index (CRI) and CIE Assessment Index in the industry. The patented seven-phosphor fluorescent source renders color more accurately than conventional three-phosphor fluorescent lighting.

It features five different light sources:

- Daylight (your choice of D75, D65 or D50)
- Illuminant A (home lighting)
- Ultraviolet
- Cool White Fluorescent
- Your choice of TL84 or U30

Ultraviolet can be used alone or in combination with other light sources for the detection and evaluation of optical brighteners, whitening agents, or fluorescent dyes and pigments. The booth's interior is made from a low gloss, neutral-gray material to eliminate color viewing errors.

The **Judge II** and **II-S** meet or exceed all major standards for the visual evaluation of color. These include ASTM D1729 for visual evaluation of



color differences of opaque materials, ISO 3664 for viewing color reproductions, and DIN, ANSI, and BSI standards.

The Judge II is a foldable, portable version. The Judge II-S is a stationary booth.

Dimensions

	Judge II	Judge II-S
Height	22.25"	21.85"
Width	27"	26.5"
Depth	22.25"	20.5"
Weight	35 lbs.	50 lbs.
Shipping Weight	40 lbs.	60 lbs.

Examolite® Luminaires

► Convenient overhead light source for daylight viewing

These light sources are suspended above your viewing area to provide accurate, simulated daylight for visual evaluation of color. Prismatic tempered diffusing glass ensures excellent brightness control and visual comfort. A specular anodized aluminum reflector maximizes fixture efficiency.

Built from heavy-duty, 20-gauge steel housing finished in a high-reflectance baked white enamel, Examolites can be suspended over the work area by a chain. Or, they can be inserted into any standard ceiling grid to accommodate evaluation rooms.

Use Examolites for quality control, grading, sorting, metamerism testing, and product evaluation. Examolite provides the same lighting conditions your customers use to accept or reject your color choice or match.

Dimensions

Length	48"	Weight	90 lbs.
Width	23.75"	Shipping Wt.	135 lbs.
Height	8"		



Two models are available:

- SD840B features three different light sources:
 - Daylight (your choice of D75, D65 or D50)
 - Cool White Fluorescent (typical office lighting)
 - Incandescent (home lighting)
- TC440B permits color evaluation under blended North Sky Daylight D75 as used for sorting, grading and general evaluation under north sky daylight. An optional matte white, UV-stabilized 1/9-inch acrylic is available for diamond grading and food applications.

Proofflite® Transparency Viewers

► Standardized lighting ensures accurate color evaluation

GretagMacbeth Proofflite transparency viewers meet the needs of the graphic arts and photography industries with superior quality and design.



Available in three different sizes:

- PLT 1010, 10" x 10" (25.4 x 25.4 cm) viewing area
- PLT 1620, 16" x 18" (40.6 x 45.7 cm)
- PLT 1642, 16" x 42" (40.6 x 106.7 cm)

Proofflite viewers ensure accurate viewing with unsurpassed daylight simulation.

Our patented 5000K lamps provide uniform illumination and superior color balance across the viewing surface. Therefore, everyone viewing your transparencies sees them in the same light. Rated for 5,000 hours of operation, Proofflite conforms to ANSI PH 2.30 and ISO 3664 specifications for visual evaluation. Each viewer is engineered with an electronic energy-saving ballast that ensures noiseless instant start-up, eliminates electromagnetic interference, and provides cool, flicker-free operation for reduced eye strain.

Proofflite viewers' light weight and compact design make them easy to move around and place in work areas with limited space. A built-in stand enables vertical, horizontal, and angular positioning – even wall-mounting.

Prooflite® Viewing Systems

- ▶ *A total viewing environment for judging color in the graphic arts industry*



In the Prooflite Viewing System, a Prooflite overhead luminaire (PLD) is installed in a Prooflite viewing booth. The result is a controlled viewing environment for evaluating color quality and uniformity.

The overhead luminaire provides patented 7-phosphor fluorescent simulated daylight. Your choice of:

- D75 North Sky Daylight
- D65 Average North Sky Daylight
- D50 Noon Sky Daylight

Proofrites can be suspended over the work area by a chain. Or, they can be inserted into any standard ceiling grid. All Prooflite PLDs use a reflector constructed of non-UV absorbing and non-yellowing anodized aluminum to prevent significant changes in color temperature. The system's diffuser is made of prismatic "water

white" glass, which – unlike plastic – won't crack or yellow with age.

The viewing booth prevents ambient light from entering the viewing area and interfering with the luminaire's illumination of the product or sample. The interior of the booth features durable, vinyl acoustical walls and a high-pressure laminated work surface to form a totally neutral gray viewing environment. So there is nothing to hinder quick and accurate visual evaluation of products or samples.

The Prooflite Viewing Booth is available with a stand or as a separate tabletop unit.

Dimensions

	Height	Width	Depth	Weight
Booth (PVB)	84"	56"	31.75"	275 lbs.
Luminaires:				
PLD 50-440	8"	23.75"	48"	57.5 lbs.
PLD 75-440	8"	23.75"	48"	57.5 lbs.
PLD 50-840	8"	23.75"	48"	68 lbs.
PLD 75-840	8"	23.75"	48"	68 lbs.
PLD 50/75-840	8"	23.75"	48"	68 lbs.

Why Daylight?

Daylight renders color accurately. Since natural daylight changes throughout the day and with changes in the weather, the need exists to simulate daylight. Almost 100 years ago, Norman Macbeth – an illumination engineer and founder of the former Macbeth – identified the need to use simulated standardized daylight for making accurate visual color judgments.

Depending on the light source, color perception varies. That's because the spectral quality or color content of the light affects how we see color. The spectral quality of natural daylight depends upon atmospheric conditions, geographic location, time of year – even time of day. For example, the color appearance of early morning sunrise and late afternoon sunset can be as low as 2300° Kelvin [also known as horizon daylight*]. At noon, the color appearance of light is approximately 5000° Kelvin and can exceed 10,000° Kelvin (on a clear day facing a north sky).

Norman Macbeth pioneered the development of accurately simulated daylight. This technology is still used today in GretagMacbeth viewing booths which permit accurate color viewing under all phases of daylight – including filtered tungsten halogen daylight, horizon daylight, blended daylight, and patented 7-phosphor fluorescent daylight. GretagMacbeth lighting products provide accurate simulation of daylight and can be used at night for second and third shift color evaluation.

*unique to GretagMacbeth Spectralight, see page 2



Sol•Source® Daylight Desk Lamp

► Viewing booth quality – at affordable desktop prices

Sol•Source is a unique item – the only desk lamp in the world that provides true daylight simulation. Using the same patented technology as our most advanced color viewing systems, Sol•Source features a filtered tungsten halogen light source to provide the most accurate simulation of natural daylight available today – 7500K, 6500K, or 5000K.

This attractive, lightweight desk lamp can be clamped on a table edge or placed on a desk using the optional weighted base. The flexible arm easily adjusts to aim the light exactly where you want it.



With Sol•Source, you get natural daylight viewing in an office, studio, factory, or showroom for not much more than the cost of a traditional desk lamp. It's ideal for graphics, fashion, art, printing, retail, and other applications that need an accurate, cost-effective daylight source for viewing colors.

Lighting Services

- Optimize viewing conditions and comply with major industry standards

Lighting Audits

Need better color viewing conditions?

We'll show you the light.

Using the industry proven LightSpex Spectroradiometer and an experienced technician, GretagMachbeth can perform a full lighting audit in your facility. We'll identify where light sources may be causing inaccurate color viewing and ensure compliance with major industry standards – and recommend the right solutions for your facility.

periodic recalibration of your viewing booths as part of an acceptable TQM program. GretagMachbeth has the expertise and equipment to perform this service for you – quickly and affordably.



Lighting Certification

Ensure compliance with Total Quality Management (TQM) programs and major industry standards

When your products must match rigid color quality standards, you want to make sure your colors are accurate and defensible. ISO, other standards, and individual customers may require

Color Viewing Products Selection Guide at a Glance

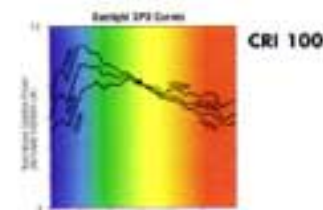
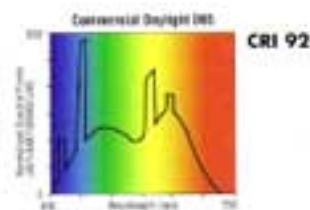
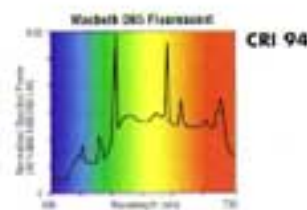
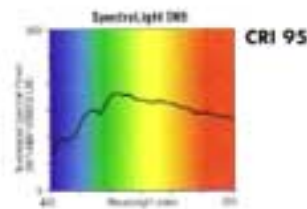
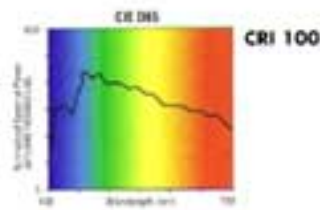
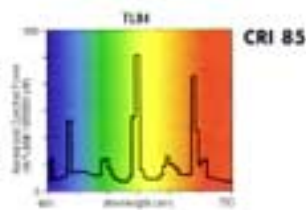
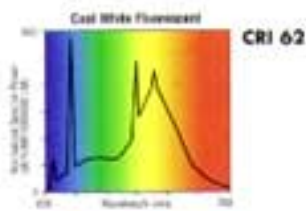
	Critical Color Decisions*	General Pass/Fail Non-critical	Grading & Sorting	Metamerism Testing	Color Specification and Selection	Graphic Arts Proofing	Graphic Arts Desktop Publishing	Graphic Arts Printing	Graphic Arts Practical Evaluation From End-Use Perspective	Evaluation of Optical Brighteners and Fluorescent Whiteners Agents	Color Viewing Rooms
SPECTRALIGHT**	•			•	•				•	•	
JUDGE**		•		•	•	•			•	•	
EXAMOLITE SDB40			•	•				•	•		
EXAMOLITE TC440			•	•							
PROOFLITE PLD						•	•	•			•
PROOFLITE PLT						•	•				
SOL•SOURCE					•	•	•				

*Critical color decisions refer to decisions made in conjunction with a color laboratory and/or within a supply chain that not only determine the color difference, but the corrective action required.

Note: Only SpectraLight contains actual UV energy found in natural daylight in addition to high intensity UV (five times that of natural daylight).

**Near UV energy five times that of natural daylight for evaluating the strength of optical brightening and fluorescent whiteners agents (OBA and FWA).

**The UV energy is long wave length (Black Light Blue - BLB) and is not harmful to humans.



Does High Color Rendering Index (CRI) Mean Accurate Color Rendering?

► The Seven-Phosphor Advantage

If you were to evaluate a red jacket under incandescent or home lighting, it would appear to be a warmer red than that same jacket viewed outdoors. This would lead you to believe that colors viewed in home lighting aren't necessarily representative of the true color. This is because incandescent light, Illuminant A, is high in red and yellow energy but low in green and blue. Daylight, on the other hand, contains more evenly balanced amounts of all colors making it a better choice for color rendering. Yet both light sources could theoretically have the same color rendering index (CRI).

That's what could happen when light sources are selected based on CRI alone. Why?...CRI (calculated by lamp manufacturers) compares the light source to be evaluated against an arbitrary reference. Depending on the color temperature of the light sources being tested (say under 5000 degrees Kelvin), the arbitrary reference would be a Planckian radiator similar to tungsten halogen or home lighting. This light source accents reds, oranges and yellows while weakening blues and greens. So your arbitrary reference, assigned a CRI of 100, is already poor at rendering color. When the light source compared is 5000 degrees Kelvin or greater, it is compared to a phase of daylight (which renders color more accurately) instead of tungsten halogen which has the highest CRI, yet poor color rendering capabilities.

What can you do? Ask your lamp supplier for the spectral power distribution curves (SPD). The curves display the amount of color energy within a light source. So the more evenly balanced the curve across the visible spectrum (red, orange, yellow, green, blue, indigo and violet or ROY G BIV), the better the light source renders color. If, however, the curve is higher in some areas of the spectrum, as is the case with incandescent, which has high red energy and little blue/green energy, the greater the distortion of color — regardless of the CRI.

The patented seven-phosphor coating on the GretagMacbeth fluorescent daylight technology provides the best daylight simulation available in a fluorescent source. Several independent studies have confirmed this. The coating ensures an evenly balanced spectral power distribution curve. So you'll get a high CRI and accurate color rendering compared to natural daylight. GretagMacbeth uses the CIE Assessment of Daylight Simulators, CIE Publication 51. This is a far more accurate method of determining the quality of a daylight simulator. More information on color and color rendering is available in our book *Fundamentals of Color and Appearance* (see page 22).