

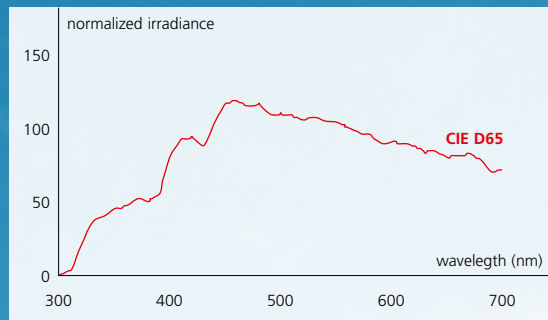


See things the right way  
with *byko-spectra pro*

Color harmony is a key quality criteria and dependent on the products' usage often guaranteed for different lighting conditions such as daylight, fluorescent and tungsten illuminations. The visual assessment is highly influenced by the type of light sources, surroundings and the observer. byko-spectra *pro* mastered the challenge to bring true daylight into your lab – as if you were outside.

### Best in Class Daylight with byko-spectra *pro*

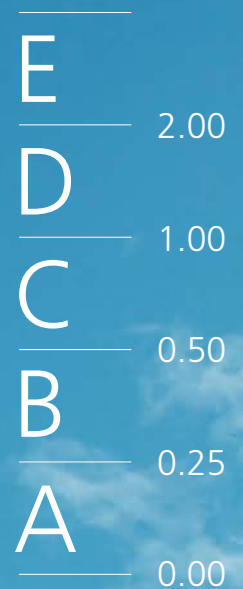
The most important color match is under natural daylight. Depending on daytime and weather conditions, natural daylight varies in color and intensity. Therefore, the International Commission on Illumination, CIE defined daylight illuminants with a specific color temperature and their relative spectral power distributions:



D65 is the theoretical representation of an average daylight at 6500K corresponding to a midday light in Western/Northern Europe (comprising both direct sunlight and the light diffused by a clear sky including UV component).

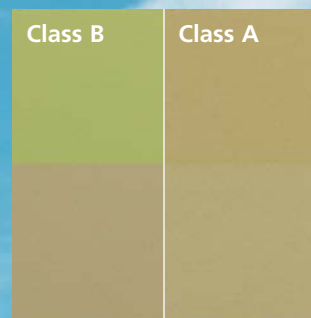
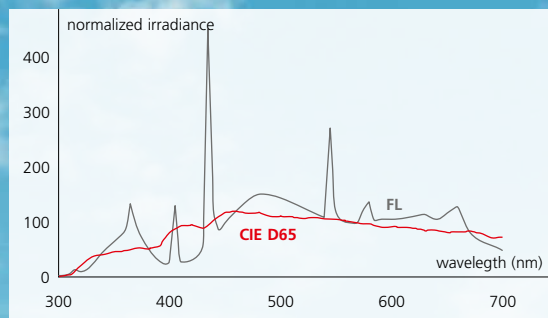
As there are no actual D65 light sources available, the challenge is to develop a D65 simulator as close as possible to the CIE D65 illuminant. The quality of a simulator is objectively assessed with the CIE Metamerism Index,  $MI_{VIS}$  corresponding to quality classes A-E with Class A being most accurate.

### $MI_{VIS}$ Class

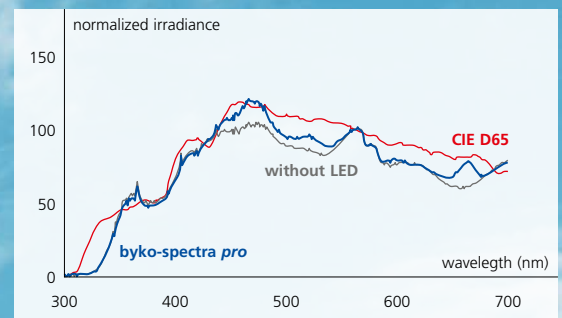


CIE Publication 51.2

### Daylight simulation with fluorescent tubes



### Daylight simulation with byko-spectra *pro* patented lighting setup





## byko-spectra *pro* – luminaire

### Light-up in Harmony

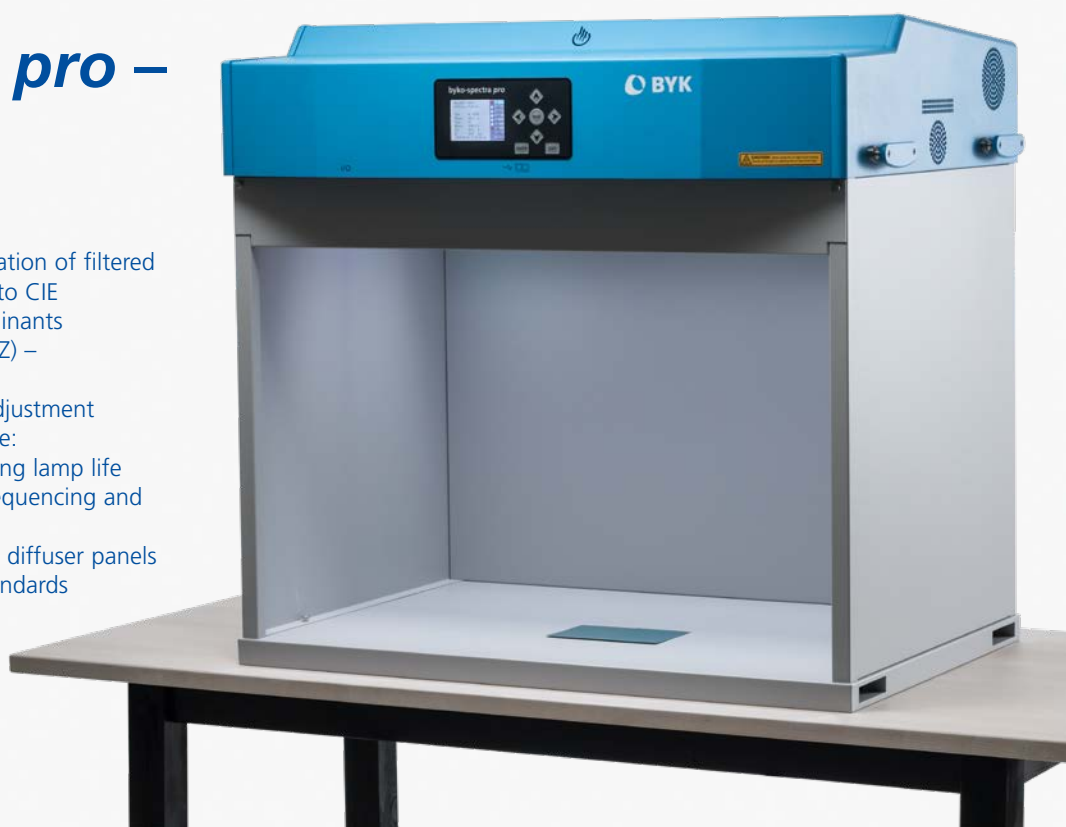
Lighting studios illuminate uniformly large appraisal fields allowing for critical color evaluation of system components or complete products like car bodies.

The byko-spectra *pro* luminaires can be hung from the ceiling as a set or as multiple units to outfit an entire color harmony room.

The luminaires have the same CLASS A illumination specifications as the light booths to ensure the precision you need in your visual color appraisals.

## byko-spectra *pro* – light booth

- › Class A daylight with smart combination of filtered halogen lamps and LEDs according to CIE
- › Metamerism evaluation with 7 illuminants  
Daylight (D65) – Incandescent (A, HZ) –  
Fluorescent (CWF, TL84, U30) – UV
- › Controlled illumination with auto adjustment
- › Actual lamp conditions always visible:  
Lux, Color Temperature  $T_{cp}$ , remaining lamp life
- › Comfortable operation with auto sequencing and remote control
- › Standardized gray interior walls and diffuser panels in compliance with international standards



## Class A daylight

A smart combination of filtered halogen lamps and LEDs guarantee best in class daylight simulation – tested according to CIE.



### 100% controlled illumination

The built-in sensors permanently control the lamp performance and automatically adjust the voltage to guarantee lamp stability.



### Lamp conditions – always in sight

Actual color temperature, light intensity (lux) and lamp operation time are shown on the display to trigger lamp replacement. The CLASS A daylight lifetime was extended to 600 hrs reducing the maintenance interval.

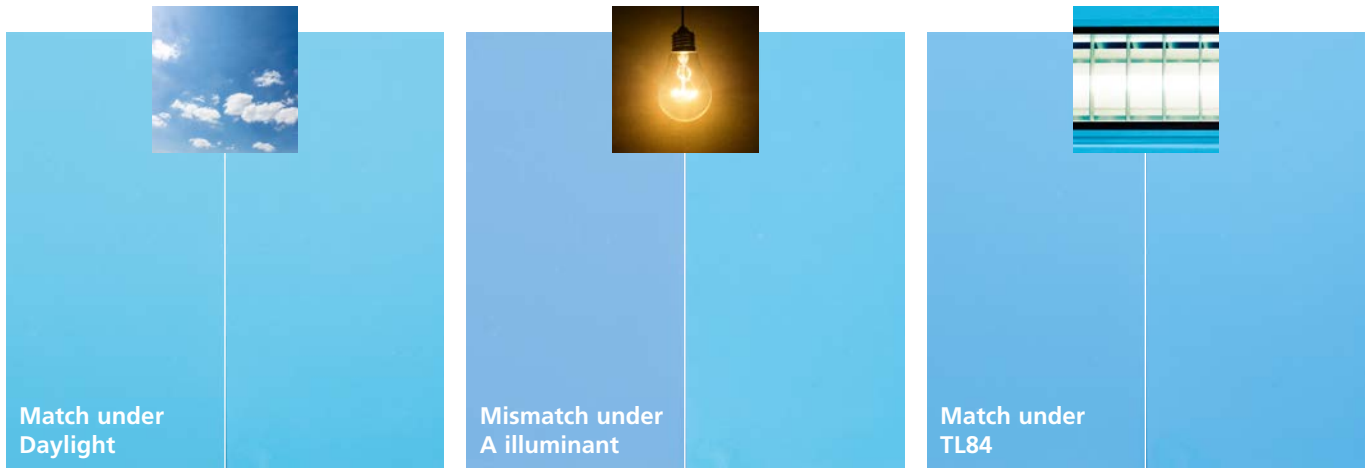


### Efficient and comfortable operation

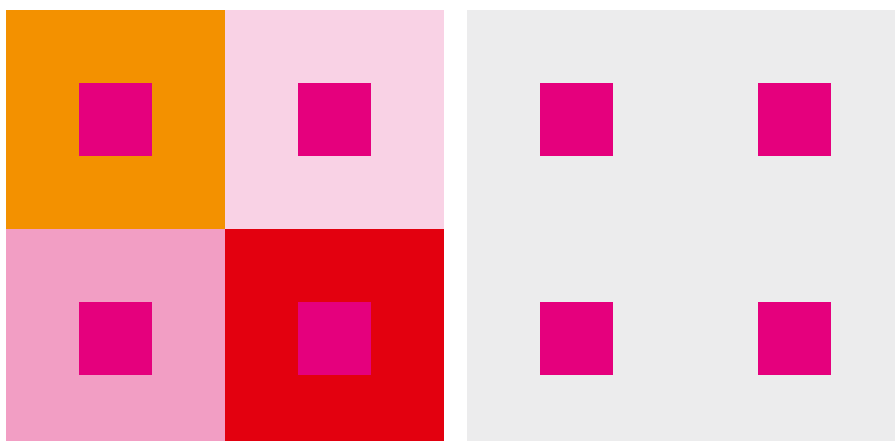
The large color display not only allows for the varying of the illuminants, but also enables easy menu guided operation. Switch the lamps with the included remote control even from a distance of up to 10 m. An Auto Sequence Mode runs automatically through the predefined sequence of illuminants for hands free operation to keep you 100% focused on color evaluation.

## No surprising metamerism

Depending on a products' usage color needs to match under variety of illuminations. This is particularly important for multi-component products consisting of different materials or parts with different pigment formulations. In these cases, there is the potential risk that for example the coffee machine appears uniform under daylight, but shows an apparent mismatch under indoor room lighting.



To be prepared for metamerism byko-spectra *pro* offers daylight with CLASS A performance, incandescent lighting, three fluorescent illuminations and UV light for the evaluation of color changes.



## What a difference a neutral background makes!

As diffused light is essential in the evaluation of solid colors, diffuser panels mix the light to ensure uniform lighting over the entire inspection field. To comply with international standards, the interior walls are a matte light gray color to eliminate the surrounding influence.

## Technical Specifications

Illuminations	Quality of illumination simulators		
Daylight	D65	Class A	$M_{vis} < 0.25$
Incandescent light	A		
Horizon (2300 K)	HZ		
Department store light	CWF, TL84, U30		
Ultra-violet light	UV		
Diffused illumination	Diffuser Panel		

Level of Illumination			
Daylight	D65	1800 lux	
Incandescent light	A	1800 lux	
Horizon (2300 K)	HZ	1800 lux	
Department store light	CWF, TL84, U30	500 – 2000 lux	(Default: 1500 lux)

### byko-spectra pro – light booth

Interior surfaces	Neutral gray, Munsell N5-N7
Viewing area	56 x 89 x 60 cm (22 x 35 x 23.5 in)
Dimensions	91 x 99 x 64 cm (36 x 39 x 25 in)
Weight	49 kg (108 lbs)

### byko-spectra pro – luminaire

Viewing area	89 x 60 cm (35 x 23.5 in)
Dimensions	21 x 99 x 64 cm (8.3 x 39 x 25 in)
Weight	40 kg (88 lbs)

**ASTM D1729:** Standard Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials

**ISO 3668:** Paints and Varnishes – Visual comparison of the color of paints

**SAE J 361:** Procedure for Visual Evaluation of Interior and Exterior Automotive Trim

**ISO 23603/CIE S012** (Previously designated as CIE Publication 51.2): Standard Method for Assessing the Spectral Quality of Daylight for Visual

**ISO/CIE 10526:** CIE standard colorimetric illuminants (withdrawn; revised by ISO 11664-2)

## You Are in Good Hands

To ensure long-term trustworthy appraisal conditions, that meet the required specifications, we offer on-site service and audits. Our maintenance programs support you to always keep viewing conditions consistent and accurate.