BalancedCare™ by axis | PATIENT BATHROOM

Since our founding in 1991, Axis Lighting has always been a family-owned company, with an emphasis on people. Our diversity translates into architectural designs that transcend the ordinary and performance that exceeds the norm. We've taken our balanced approach to lighting into the healthcare market to provide solutions that not only function properly, but also provide beautiful, timeless design for all users of the space.

Form meeting function – it's in our DNA.

Balanced**Care**™
PATIENT BATHROOM

Providing safe patient navigation to and from the patient bathroom to prevent dangerous falls is a critical concern. Steplights placed outside the bathroom balance the need for safe navigation while avoiding circadian disruption. Like the patient room, the lighting in the bathroom is also multi-functional. These spaces benefit from modern, hospitality-driven designs with enhanced functionality, such as sconces with integral nightlights and vanity mirrors with high vertical illumination. Balanced**Care**™ by Axis brings it all together.

The BalancedCare™ Approach

Design for healthcare has been a tale of two extremes – offering either functional but institutional appearance, or extremely decorative forms while ignoring cleanability and other critical standards. The BalancedCare™ family by Axis Lighting ties it all together. BalancedCare provides lighting for wellness without trade-offs, offering patent-pending BeWell™ performance optics for both visual comfort and functionality, along with features that promote infection control and equipment compatibility. Finally – a product offering that addresses **ALL** the requirements of today's complex healthcare environment.

BalancedCare™ Pillars

WELLNESS

The built environment can have a positive effect on the overall state of a person's physical and emotional wellbeing. With a focus on patient and staff wellness, thoughtfully configured lighting that balances both visual and circadian needs, as well as links to nature, promotes healing outcomes.

ARCHITECTURAL FORM

BalancedCare luminaires provide timeless, stylized forms concealing sophisticated technologies that complement and enhance today's architecture. Sleek, low profile styles replace mundane, institutional looks of the past and elevate healthcare lighting design to today's standards.

FUNCTIONAL OPTICS & VISUAL COMFORT

BeWell light guide technology provides multiple precise distribution options to deliver the many layers of light required in healthcare environments, as well as glare-free comfortable lighting that supports the visual tasks of staff while enhancing the overall wellbeing of patients.

INTELLIGENT CONTROL

BalancedCare is an intuitive 'controls-agnostic' collection with intelligent patient bed control compatibility, as well as wireless and POE; and spectral programmability provided by tunable white and BIOS SkyBlue® technologies. We partner with industry-recognized controls suppliers for integration into any building automation system.

INFECTION CONTROL & PERFORMANCE

BalancedCare products are constructed of materials and finishes that withstand hospital cleaning protocols, standing up to the most stringent infection control requirements. They meet functional and application-specific industry listings such as UL, ADA, Ingress Protection (IP) and National Sanitation Foundation (NSF) standards.

EASE OF MAINTENANCE

Smooth, non-corrosive surfaces can withstand the harsh cleaning protocols necessary to minimize risk of hospital-acquired infections (HAIs). Room-side access to drivers and components facilitates maintenance efforts, reduces costs, and prolongs sustainability of luminaire systems.

BalancedCare™ TECHNOLOGIES

BalancedCare by Axis Lighting creates the required balance between innovation and patient/healthcare worker wellness. This is achieved by combining BeWell Optics™, BeWell Controls™ and BeSealed® luminaire construction in the next generation of healthcare solutions.

BeWell light guide optics provides glare-free, comfortable lighting that supports the visual tasks of staff, and enhances the overall wellbeing of patients.

BeWell Controls is an intuitive, "controls-agnostic" approach with intelligent patient bed control compatibility, as well as wireless and POE; and spectral programmability provided by tunable white and BIOS SkyBlue® technologies.

BeSealed ties it all together with product design features that support easy maintenance and cleanability, that meet the most rigorous independent listings in the industry.

BeWell™ OPTICS

BeWell™ TECHNOLOGIES

BeSealed® CONSTRUCTION

BeWell™ CONTROLS

Providing Multidimensional Distribution and Immersive Illumination

Precisely coded and aligned molecules in the light guide shape LED output, from individual points of light, in all three dimensions. The science is complicated. The result is easy – controlled distribution that puts light only where you need it. Direct, indirect, asymmetric or a combination with high efficacy performance, no matter the distribution.

Visual comfort takes on a whole new meaning. Instead of reflected glare, the unique light guide produces comfortably diffuse illumination for a more natural appearance. It matters most when placed in line of sight, like a bed light directly above the patient. That's where comfort is put to the test.

Innovative Optical System Directs Light Where It's Needed — Comfortably

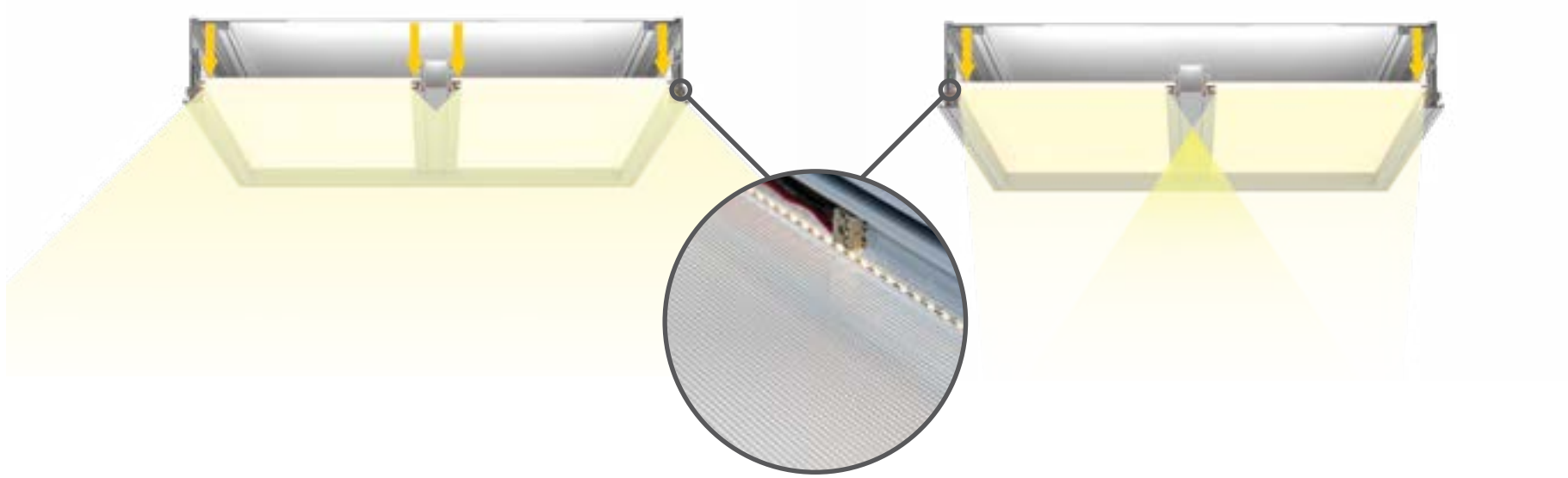
BeWell Optics delivers lighting that promotes a healing environment. BeWell is a patent pending, materials-based technology that uses molecular optics to direct - not reflect - light. The result is amazingly uniform distribution, without glare, shadowing, or pixelation. BeWell provides better visual acuity for tasks, and softer, healing visual comfort in the space.

AMBIENT

BeWell Optics replaces traditional segmented reflectors to disperse the light uniformly across the entire lens.

EXAM

In the same luminaire, BeWell optics balances concentrated higher intensity light for examination with softer ambient light.



SEALED LIGHT GUIDE

Unique patent pending sealed light guide design, optimized for optics, infection control and multi-function controllability

BeSealed Construction

All BalancedCare luminaires feature BeSealed design attributes that enable easier maintenance, less costly construction, updated lighting technology, and engineered features that support today's stringent infection control standards. BeSealed is the BalancedCare total mechanical solution.

BeSealed® CONSTRUCTION

IP64 NSF

BalancedCare lightweight sealed housing technology eliminates complex and costly welded housing construction

Extruded aluminium housing maximizes LED heat dissipation to ensure cool operation and long life

LENS TOOL

The lens tool seamlessly pulls the doorframe away from the housing and provides easy access to the internal electrical cartridge

TORSION SPRINGS

Torsion springs secure the doorframe to the housing, and ensure a tight seal without the use of exposed fasteners for aesthetics and cleanability

BeWell Controls

When designing around BalancedCare luminaires, you get the support of Axis Lighting's robust electrical team of professional engineers who work towards proper integration and performance of control systems. Axis is agnostic with respect to controls and has partnered with industry recognized controls suppliers to support integrated lighting within healthcare environments, ranging from the nurse call system to the entire facility.

Successful lighting for healthcare includes the entire system — not only luminaires and controls — but also the physical switches and digital interfaces for the wide variety of building occupants. BeWell Controls supports the design team's controls intent, while advocating for maximum flexibility and friendly usability for patients and medical staff.

Long active on many of the healthcare and controls industry committees, our recognized domain experts are very familiar with research and best practices, which enables us to work with specialized healthcare design teams and adds value that consistently improves project outcomes for our customers.

Our in-house innovation specialists will help deliver everything from standard 0-10V dimming and code compliance to cutting edge Power Over Ethernet (POE) systems. Whether it's advanced IOT sensing for people and asset tracking, color technology for health and wellbeing, or other new use cases, the BalancedCare team understands and supports the complex healthcare environment.

BeWell™
CONTROLS

WIRELESS PoE

Healthcare facilities are heavily regulated and undergo continuous maintenance, inspection and recertification to ensure 24/7 operation. BalancedCare luminaires can be integrated into the overall building automation network, allowing facilities managers to schedule lighting and other systems according to usage requirements, which is one way to simultaneously reduce costs and reduce a facility's carbon footprint.

Patient Bathroom

WELLNESS

Reducing the risk of falls is of the highest priority in patient bathrooms. Safe maneuverability from vanity to toilet area, often assisted by staff, is improved by uniform, shadow-free illumination. In addition to effective lighting in patient bathrooms, BalancedCare addresses safety and infection control concerns for overall wellness.

FUNCTIONAL OPTICS & VISUAL COMFORT

BeWell™ Optics optimizes light distribution, comfortably directing light where needed for patient bathroom needs. High vertical light levels at the vanity – without shadowing – improve facial modeling for patients of all ages. Glare-free lighting is important for both patient comfort and safety while tending to hygiene, as well as a nurse's ability to effectively assist. Low level amber nightlighting introduces a layer of safety without disturbing patients' sleep patterns.

INTELLIGENT CONTROL

BeWell™ Controls encapsulates everything from wall switches to sensors in patient bathrooms, to provide safety and enhance the patient and staff experience. Sensor-enabled nightlighting from the vanity mirror guides a patient from bed to bath without reaching for a wall switch or being disturbed by harsh white light. Bathroom light turns on simultaneously with overbed exam light to facilitate patient evaluation. Convenience and safety are prioritized.

ARCHITECTURAL FORM

Sleek, low profile architectural forms that blend into the healing environment are a refreshing change from the mundane and institutional looks of many healthcare products today; they conceal the sophisticated features and state-of-the-art performance these luminaires provide.

INFECTION CONTROL & PERFORMANCE

Sink basins, showers and commodes introduce opportunities for bacteria and viruses to propagate. BalancedCare luminaires feature sealed housings and optical media, along with smooth, corrosion resistant surfaces for ease of cleanability. Ingress Protection ratings determine that fixtures are sealed against contaminants and moisture in these areas, and NSF2 ratings assure cleanability. Look for the performance icons associated with each product.

BeSealed® CONSTRUCTION

EASE OF MAINTENANCE

Smooth, non-corrosive surfaces can withstand the harsh cleaning protocols necessary to minimize risk of healthcare associated infections (HAIs). Roomside access to drivers and components facilitates maintenance efforts, reduces costs, and prolongs life of luminaire systems.

Lighting Requirements

Distinct functional modes deliver high quality lighting for a complex environment: These functions work independently or together to deliver light levels and distributions that align with recommended practice, designed to suit both patient and staff needs.

MIRROR

Integrally illuminated vanity mirror, flat or beveled, with color rendering and illuminance levels to enhance facial modeling or to evaluate skin tones for patients of all ages and abilities. Mirror has 5° tilt option for wheelchair viewing angle; provides recommended 400 lux vertically from 36" to 60" at vanity's edge.

NIGHTLIGHT

Sensor-enabled white or amber nightlight (590 nm) provides safe entry into bathroom without having to fumble for a switch. Turning on a bright white light could prevent patient from returning to sleep and disrupt circadian rhythms; provides the recommended 60 lux on vanity surface.

Supplementary Requirements

Distinct functional modes deliver high quality lighting for a complex environment: These functions work independently or together to deliver light levels and distributions that align with recommended practice, designed to suit both patient and staff needs.

STEPLIGHT

Low level steplights help patients safely navigate from bed to bathroom at night. Mounted at 18" Above Finished Floor (AFF), with 90° cutoff to minimize glare, they provide recommended low level illuminance of 4 lux.

GENERAL AMBIENT

Layers of light are especially important in a patient bathroom; recessed ceiling mounted luminaires and/or sconces help fill the volume of space with shadow-free lighting to provide the recommended 100 lux at floor, 2:1 avg:min uniformity.

SCONCE

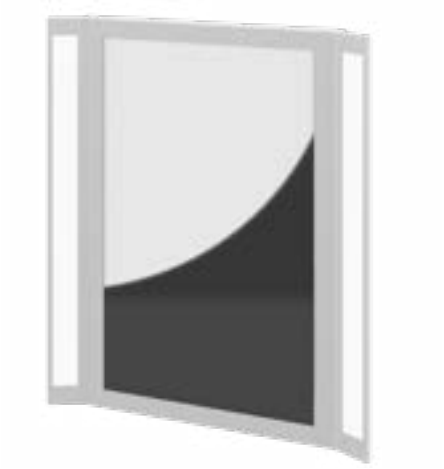
Slim, soft-glow decorative sconces provide a soothing aesthetic, project less than 3" from the wall for ADA compliance and include an integral amber nightlight. They contribute to general ambient lighting.

FLAT VANITY MIRROR BCVF SHOWN

Vanity Mirror

Available in either a contemporary flat or beveled design, the BalancedCare™ Vanity mirror integrates vertical LED lighting, which improves facial modeling for grooming. The mirror has an optional amber nightlight for patient safety, and also tilts at a 5° angle to enable visibility for patients in wheelchairs.

- Shallow depth, surface-mount with beveled or flat edges
- Integral shadow-free vertical BeWell Optics for superior facial modeling
- LED lighting with high color-rendering (90 CRI), as well as red rendering (R9>50) for skin tone evaluation
- Fixed 5° tilt adjustment available for ADA accessibility
- Optional amber or white (2700K-4000K) nightlight



BEVELED MIRROR
BCVB

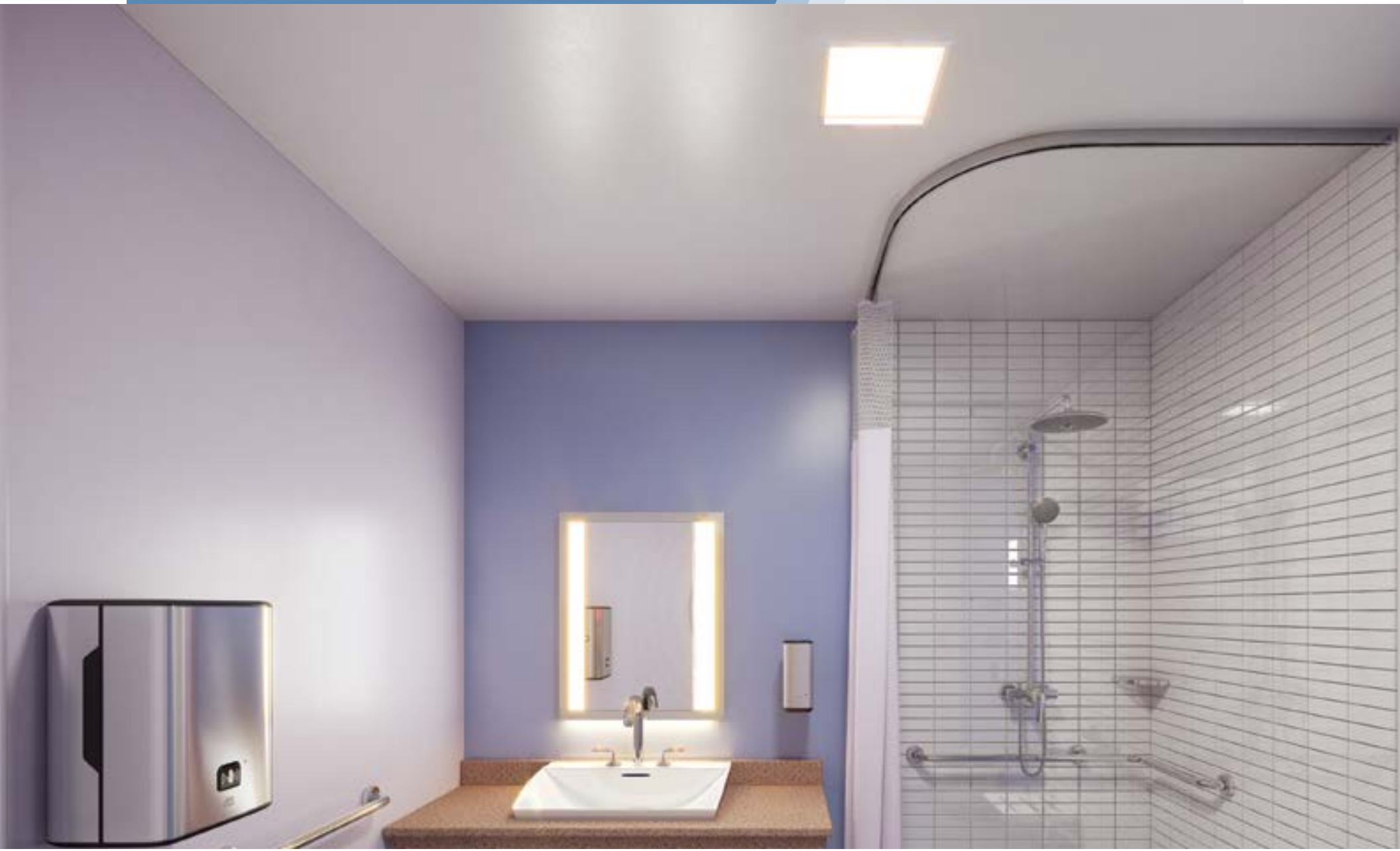
Optional 5° tilt

Angled light panels direct light towards face for shadow free illumination.
Mirror Depth= 1 ¼" (32mm)

FLAT MIRROR
BCVF

Patent Pending

* FOR POLYCARBONATE OPTION ONLY



FLEXIBLE AMBIENT BCFA22 SHOWN

Flexible Ambient

Employing BeWell™ light guide technology, this series delivers multiple light distributions with glare-free visual comfort. The center strip can be illuminated or left blank, or customized with accents, Mikrolite downlights or decorative louvers. Available in 1'×1', 1'×4', 2'×2' and 2'×4' dimensions.

- BeWell™ light guide directs light from each point source, eliminating transition lines, pixelation, and shadows
- General diffuse and wide distributions available
- Modular optical chamber with room-side access
- Controls and sensor ready
- Optional integration of MikroLite™ recessed downlights or Stencil™ surface accents (1'×4', 2'×2', 2'× 4')
- Low profile design, housing only 4" deep
- Available CCTs: 3000K, 3500K, 4000K
- Tunable white and BIOS also available

BCFA11
(1'×1')

BCFA14
(1'×4')

BCFA22
(2'×2')

BCFA24
(2'×4')

BCFA22

Patent Pending

Flexible Ambient Options

The Flexible Ambient Series is available with multiple options to enhance design. The center strip can be left blank or illuminated, to add an extra boost of ambient light. Mikrolite downlights are also available in various configurable lengths and multiple beam spread offerings, while stylish accents can field rotate 359° to add a spot of light where desired. The louver allows higher lumen outputs in a visually comfortable package.

Flexible Ambient provides general ambient lighting with adjustable accents to highlight signage and add extra dimension in an elevator lobby.

ILLUMINATED CENTER STRIP

BLANK CENTER STRIP

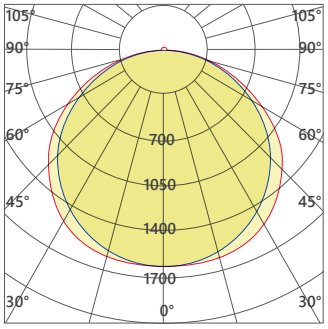
MIKROLITE

LOUVERED

ACCENTS

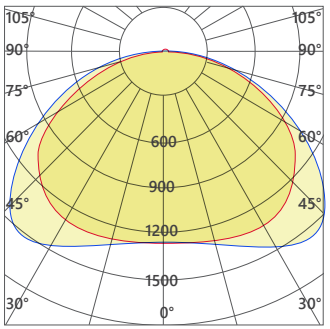
Flexible Ambient Distributions

The Flexible Ambient family takes ambient lighting to a whole new level. Its two distinct distributions — general diffuse and wide — allow spacing flexibility between luminaires, depending on ceiling height and application. The general diffuse distribution is suitable for lower or standard height ceilings, such as waiting areas, offices or nurses' stations; the wide distribution can be spaced farther apart for higher ceilings in areas such as lobbies, dining areas or atria.



GENERAL DIFFUSE

For standard ceilings at 8' to 9' height, such as this nurses' station with floating ceiling,integrating luminaires with general diffuse distribution, at a closer spacing, provides uniformity and visual comfort for ambient lighting throughout busy days and nights.



WIDE

For 12' to 15' ceilings, the wider distribution luminaires can be placed farther apart, acting as a quiet backdrop to guest activity or architectural details. They provide uniform, shadow-free lighting for areas such as waiting rooms, lobbies or atria.

CLOSED BOOK SCONCE BCSC SHOWN

Sconces

Architectural sconces complement ambient lighting in the corridor, and often provide low-level lighting when daytime transitions to evening. BalancedCare Lighting offers three decorative designs in multiple sizes for scalability, with integral nightlight option to aid navigation. Additionally, each luminaire is low profile to meet ADA requirements, and features BeSealed Construction for cleanability.

- Designed with comfortable BeWell Optics providing ambient lighting and wall glow
- Amber nightlight option to aid navigation
- Detachable backplate for quick-disconnect and room-side access to driver
- Horizontal or vertical orientation, surface mounting in multiple lengths and widths
- Shallow depth (Open Book - 1 7/8", Box - 2", Closed Book - 2 5/8")
- BIOS and tunable white available in select sizes

BOX
BCSB

CLOSED BOOK
BCSC

Low profile (less than 3")
ADA compliant

OPEN BOOK
BCSO

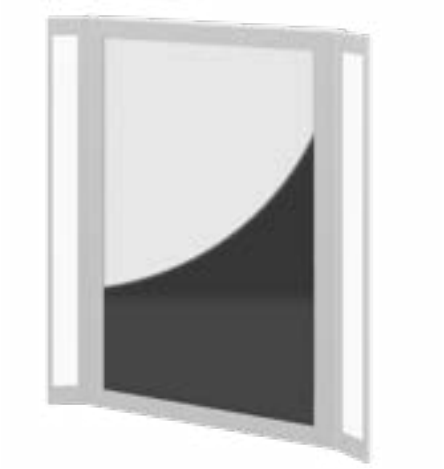
Patent Pending

CLOSED BOOK SCONCES BCSC SHOWN

Vanity Mirror

Available in either a contemporary flat or beveled design, the BalancedCare™ Vanity mirror integrates vertical LED lighting, which improves facial modeling for grooming. The mirror has an optional amber nightlight for patient safety, and also tilts at a 5° angle to enable visibility for patients in wheelchairs.

- Shallow depth, surface-mount with beveled or flat edges
- Integral shadow-free vertical BeWell Optics for superior facial modeling
- LED lighting with high color-rendering (90 CRI), as well as red rendering (R9>50) for skin tone evaluation
- Fixed 5° tilt adjustment available for ADA accessibility
- Optional amber or white (2700K-4000K) nightlight



BEVELED MIRROR
BCVB

Optional 5° tilt

Angled light panels direct light towards face for shadow free illumination.
Mirror Depth= 1 ¼" (32mm)

FLAT MIRROR
BCVF

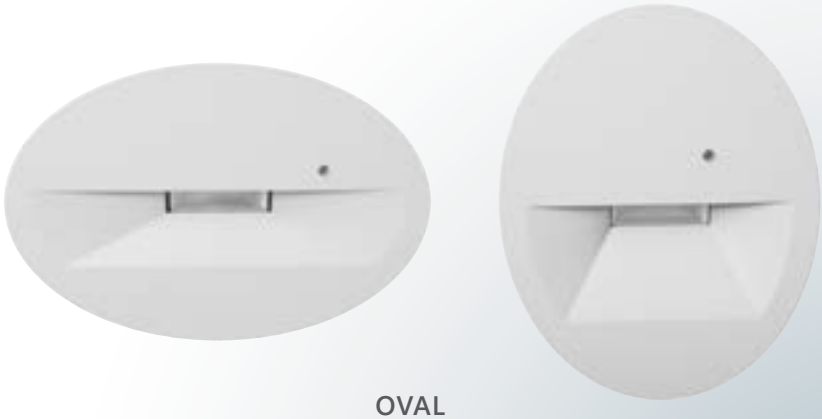
Patent Pending

RECTANGULAR HORIZONTAL STEPLIGHTS BCSRH SHOWN

Steplights

BalancedCare™ Steplights provide safe navigation through the patient room, bathroom, corridors and other common areas. Durable in design, they are available in multiple styles and optional white (2700-4000K), amber or blue LED.

- Rectangular and oval faceplates, horizontal and vertical mounting
- Steplights mount to a standard junction box
- 90° cutoff obstructs light trespass
- Multiple LED choices: White 2700 - 4000K, Amber or Blue
- Activation by photocell sensor
- Pre-set light level can be adjusted up or down during installation
- Semi-recessed; faceplates extend only $^{5}/_{8}$" off wall
- Soft contoured design prevents dust collection and is easy to clean



OVAL
BCSOH / BCSOV

Thru wall option

White LED:
2700-4000K

Amber LED

Blue LED

RECTANGULAR
BCSRH / BCSRV

Patent Pending

Vanity Mirror

FLAT
BCVF

BEVELED
BCVB

Flexible Ambient

FLEXIBLE AMBIENT
BCFA11 (1'×1') BCFA14 (1'×4')

Steplights

RECTANGULAR
BCSRV / BCSRH

OVAL
BCSOV / BCSOH

Listings and Technologies

ADA Compliant — objects projecting from walls (e.g., sconces) shall protrude no more than 4" into walks, halls, corridors, passageways or aisles

CCEA Approved — The City of Chicago Environmental Air (CCEA) rating ensures that the luminaire is inherently airtight. Wiring and/or branch circuit terminations are sealed off and gasketed from the plenum air space. This listing ensures that the luminaire is sealed to limit air flow from the room side to the plenum.

Damp — Denotes that the luminaire is UL Listed for Damp Locations. A damp location is normally or periodically subject to condensation of moisture in, on, or adjacent to the electrical components of a luminaire.

IK10 – an IK rating indicates the capacity of an enclosure to protect its contents from external impacts in accordance with IEC 62262:2002 and IEC 60068-2-75:1997. The IK10 rating is the maximum on the scale from IK00 (no protection) and proves protection against 20 joules of impact (the equivalent to the impact of a 5kg mass dropped from 400mm above the impacted surface)

IC — Insulated Ceiling (IC) recessed lights are rated for direct contact with insulated ceilings or, that is, they can be installed in contact with combustible material or blanketed with thermal insulation.

IP64 — UL Certified IP64 per IEC 60598 ensures that the enclosure is dust-tight and protected against splashing water without any harmful effects.

NSF2 — denotes that the luminaire has been evaluated for corrosion resistance, cleanability and the ability of exposed material to withstand normal wear. This supports the infection control standards established by healthcare.

UL/CUL Listed — All BalancedCare luminaires have been tested to be in compliance with Underwriter's Laboratory (UL) performance standards. UL is a world leader in product safety testing and certification.

BeWell™ Optics — BeWell is a patent-pending, materials-based lightguide technology that uses molecular optics to direct light. These highly efficient optics are multi-functional, available in direct, indirect, asymmetric or a combination to deliver high performance, comfortable illumination.

BeSealed® Construction — Design attributes that enable easier maintenance, less costly construction, updated lighting technology, and engineered features that support today's stringent infection control standards.

BeWell™ Technologies — BeWell Technologies encompasses BalancedCare controls (which includes patient controls, wireless and POE), Axitune tunable white and color tuning systems, and BIOS SkyBlue.

BeWell™ Controls — BeWell Controls takes a systems approach to ensure seamless integration between the luminaires, sensors, control devices and users. It includes all elements of a facility's controls system, supporting Axis' agnostic approach to provide comprehensive systems support.

POE — Power over Ethernet (POE) delivers both lighting power and data transfer on one low-voltage wire, and enables communication with multiple building systems using Ethernet protocol, along with many types of sensors. All BalancedCare luminaires are UL Listed 2108 for POE compatibility.

Axitune Tunable White — Tunable white technology enables the user to independently control both color temperature and intensity of light within a given application. This provides the ability to change the color of light from warm to neutral to cool in appearance, over time, based on the needs of the occupant or the space. See page 16 for additional information.

BIOS® — Axis Lighting is a proud partner with BIOS Lighting. Its SkyBlue® technology creates environments that improve alertness and promote better sleep, health and well-being. BIOS is available in BalancedCare overbed luminaires.

Ratings Explained

EXAMPLE

IP64 DEGREES OF PROTECTION INDICATED BY THE FIRST CHARACTERISTIC NUMERAL

Numeral	Short Description	Brief details of objects which will be "excluded"from the enclosure
0	Non-protected	No special protection
1	Protected against solid objects greater than 50 mm	A large surface of the body, such as a hand (but no protection against deliberate access). Solid objects exceeding 50 mm in diameter.
2	Protected against solid objects greater than 12 mm	Fingers or similar objects not exceeding 80 mm in diameter. Solid objects exceeding 12 mm in diameter.
3	Protected against solid objects greater than 2.5 mm	Tools, wires, etc., of diameter or thickness greater than 2.5 mm Solid objects exceeding 2.5 mm in diameter.
4	Protected against solid objects greater than 1.0 mm	Wires or strips of thickness greater than 1.0 mm. Solid objects exceeding 1.0 mm in diameter.
5	Dust-protected	Ingress of dust is not totally prevented but dust does not enter in sufficient quantity to interfere with satisfactory operation of the equipment.
6	**Dust-tight**	**No ingress of dust**

EXAMPLE

IP64 DEGREES OF PROTECTION INDICATED BY THE SECOND CHARACTERISTIC NUMERAL

Numeral	Short Description	Brief details of objects which will be "excluded" from the enclosure
0	Non-protected	No special protection
1	Protected against dripping water	Dripping water (vertically falling drops) shall have no harmful effect.
2	Protected against dripping water	Vertically dripping water shall have no harmful effect when the enclosure is tilted at any angle up to 15° from its normal position.
3	Protected against spraying water	Water falling as a spray at an angle up to 60° from the vertical shall have no harmful effect.
4	**Protected against splashing water**	**Water splashed against the enclosure from any direction shall have no harmful effect.**
5	Protected against water jets	Water projected by a nozzle against the enclosure from any direction shall have no harmful effects.
6	Protected against heavy seas	Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.
7	Protected against the effects of immersion	Ingress of water in a harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time.
8	Protected against submersion	The equipment is suitable for continuous submersion in water under conditions which shall be specified by the manufacturer.

SOLUTIONS DESIGNED TO SIMPLIFY CIRCADIAN LIGHTING IN EVERYDAY APPLICATIONS

BIOS SkyBlue® for Healthcare

Life is all about contrast, perhaps none as important as light and dark, day and night.

As humans, we have evolved with blue sky and daylight as natural cues to keep our body clocks aligned with the 24-hour day. This healthy contrast between daylight and darkness allows our circadian rhythms to function as designed.

Even though this natural lighting cycle is healthy, hospital lighting typically feels anything but natural. BIOS SkyBlue® uses technology to bridge the gap, stimulating circadian response while maintaining the appearance of white light in familiar correlated color temperatures (CCTs).

WHAT YOU DON'T SEE CAN HELP YOU

Benefits of Natural Light without Compromised Light Quality

To the naked eye, the white light produced by a BalancedCare™ luminaire with SkyBlue option may appear identical to the white light from traditional LEDs, but the actual spectrum is different – it delivers greater melanopic content, which contributes to higher melanopic to photopic (m/p) ratios, higher equivalent melanopic lux (EML) and circadian stimulus (CS) – current circadian lighting metrics.

A broad range of Axis luminaires seamlessly integrate SkyBlue technology to enable creation of environments that improve alertness and promote better sleep, health and well-being. For additional Axis lighting featuring BIOS SkyBlue technology, please visit www.axislighting.com

BCFA
BalancedCare Flexible Ambient

BCSB/BCSC/BCSO
Sconces

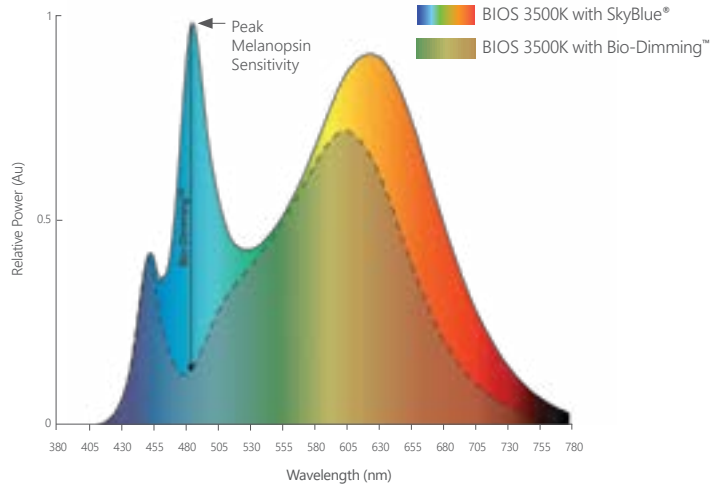
BCMF*
BalancedCare Multi-Function Overbed

*Ambient Mode Only

BIOS DYNAMIC SOLUTION FOR 24-HOUR FACILITIES

Better sleep by night, improved alertness by day

BIOS 3500K Dynamic Engine Spectral Power Distribution



Dimmer Settings With Bio-Dimming™ *

	DIMMER SETTINGS*	BIOS SKYBLUE*	LIGHT OUTPUT		
	100% (FULL ON)	100%	100%	BIO-DIMMING™	BIOS SkyBlue maintained for maximum circadian Impact. Light output remains relatively constant.
	99%-51%	100%-0%	100%-90%		
	50%	NO BIOS	90%	INTENSITY DIMMING	BIOS SkyBlue removed to provide minimal circadian impact. Light output dims down linearly.
	49%-0%	NO BIOS	LINEAR DIMMING		

* Also compatable with push button dimmers

BIOS dynamic light engines use easy-to-program Bio-Dimming™ to provide full SkyBlue® content during the day and allow SkyBlue® to be removed in the evening while light levels remain constant. Once SkyBlue is reduced then light levels can be changed.

Functional white light with healthy impact

- Maintains appearance of white light while invisibly delivering a spectrum with greater melanopic content
- Peaks at 490 nanometers (nm) to target melanopsin, the light-sensitive protein contained in our non-visual photoreceptors

Static solution supports proper daytime circadian stimulus

- The static spectrum delivers a steady but invisible blue-light boost to white light throughout the day, in choice of 3000K, 3500K or 4000K

Dynamic solution for 24-hour facilities

- Supports daytime circadian stimulus, reduces nighttime stimulus
- Skin color in its true light
- CRI > 80; R9 > 75 at each correlated color temperature, because color rendering is so important in healthcare

The controls you know

- Uses any single channel LED driver with 0-10V dimming interface

CIRCADIAN LIGHTING METRICS

Circadian Stimulus (CS), Equivalent Melanopic Lux (EML), and Melanopic Equivalent Daylight Illuminance (MEDI)

Metrics have been developed as tools to enable lighting professionals to create environments that promote alertness by day and good sleep at night – prime examples of circadian rhythms, or biological processes that repeat every 24 hours.

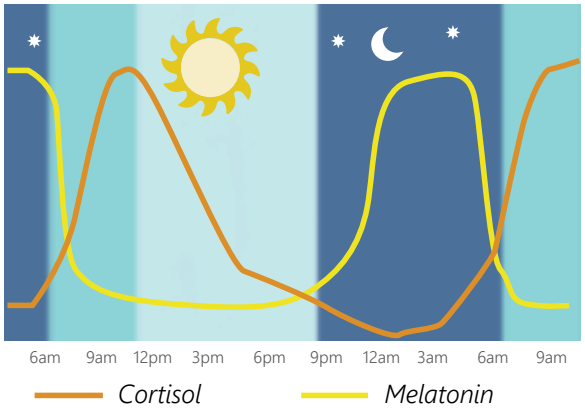
This becomes especially important in hospitals where schedules are erratic, where support of circadian health can also improve overall health and wellbeing.

Key elements to entrain – or synchronize – humans' biological clocks to the light/dark cycles of the 24-hour day are amount, spectrum, length of exposure, time of day, distribution, and personal light history – one's sensitivity to light.

Research has shown that these elements, when delivered in the right combination, can improve sleep quality, reduce agitation, depression, and fatigue for patients, caregiving staff, and families in hospital environments. These positive effects can last beyond a patient's discharge or after a night shift nurse leaves to go home.

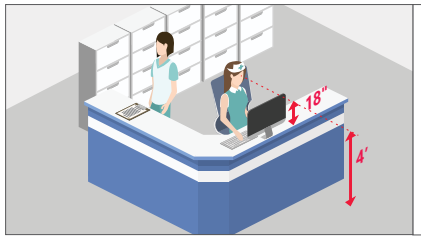
Delivering the right light at the right time of day helps avoid circadian disruption, which can cause poor sleep but also increase risk of serious illnesses such as cancer, heart disease and delirium.

Recently discovered photoreceptors in the human eye – photosensitive retinal ganglion cells or ipRGCs– contain the protein melanopsin, which is highly sensitive to 460-480 nm blue wavelengths. When stimulated by light, ipRGCs send a signal to the body's master clock, telling it to reset its cycle for the next 24 hours. That signal triggers a variety of biological processes, including essential production of hormones such as melatonin and cortisol.



Importance of light/dark signal:

Cortisol rises with the early light of day, keeping us awake and alert. Melatonin is suppressed by light during the day, but rises as darkness sets in to promote sleep.



ALL CIRCADIAN METRIC CALCULATIONS REQUIRE

Spectral power distribution **(SPD)** of light sources; correlated color temperature **(CCT) is not an accurate measure**

Light measured on the **vertical plane at eye level,** either 4'-0" Above Finished Floor (AFF) or 18" above the workplane, for adjustable height desks

CS characterizes the human response to light in terms of melatonin. EML and MEDI characterize a light source's effectiveness at stimulating melanopsin.

The three are not interchangeable, and each tells a different story – but any of them will indicate if one is on the right path to effective circadian lighting design, depending on the application.

Each metric provides its own calculation tool and counts toward achieving points in the **WELL Building Standard,** v1 or v2, in the **Circadian Lighting Design** category.

CS

- Factors in contribution of all five photoreceptors, along with amount and spectrum to assess circadian stimulation
- It estimates the percentage of melatonin a person will suppress after one-hour exposure to a light source during the day, which in turn affects that person's melatonin levels at night
- Robust melatonin levels may result in better sleep, improved mood, performance, and feelings of alertness
- High CS of >0.3 recommended for early morning, reducing to <0.1 in the evening
- *https://www.lrc.rpi.edu/cscalculator/*

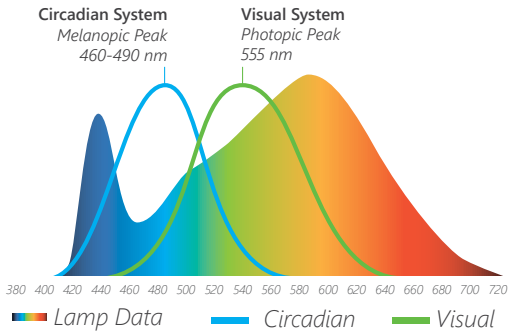
EML

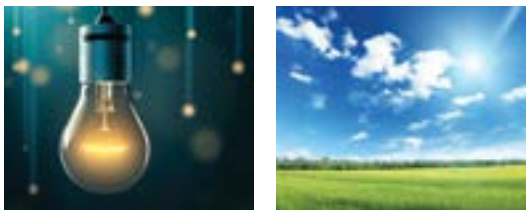
- Introduces the unit 'melanopic lux' as a measure of light's effect on stimulating the circadian system compared to the visual system
- It is a two-part calculation involving the melanopic to photopic (M/P) ratio and lilluminance at the eye (Ev)
- The M/P ratio formula converts visual response to circadian response based on the SPD of one (or more) light sources
- It will indicate whether light source A is better or worse than light source B, of equal energy, at stimulating melanopsin
- ***EML = M/P ratio x Ev (vertical illuminance)***
- *https://standard.wellcertified.com/tables > Table L1: Melanopic Ratio > IWBI link to spreadsheet*

MEDI

- Factors in contribution of all five photoreceptors to determine how the ipRGCs respond to light compared to rods and cones
- Like EML, it is a two-part calculation requiring the melanopic daylight efficacy ratio (m-DER) and illuminance at the eye (Ev)
- M-DER compares a light source's ability to stimulate melanopsin to that of standard daylight
- ***MEDI = m-DER x Ev (vertical illuminance)***
- *https://balancedcare.axislighting.com/wp-content/uploads/2020/11/CIE-S-026-alpha-opic-Toolbox_Nov2020.xlsx*

Image by Lighting Research Center





WHAT IS UGR?

Glare is in the eye of the beholder! UGR measures its impact on visual comfort while helping to achieve WELL points.

The Unified Glare Rating (UGR) is a metric used to predict *discomfort glare* in interior applications and considers the direct light component. It has gained renewed interest of late to achieve points toward WELL certification. Well v2 of the WELL Building Standard, under the L04 Electric Light Glare Control category, allots points for achieving a UGR of 16 or lower as a luminaire consideration, or as a space consideration, for regularly occupied spaces. As a glare evaluation method, UGR has been defined in CIE documents: CIE 117-1995, CIE 190-2010, CIE 232-2019.

UGR is not meant to be an attribute of the luminaire alone – but should be based on an application.

It indicates the contrast, or ratio, between luminaire luminance (perceived as brightness) to background luminance from a reference vantage point, i.e., a patient sitting up in bed, looking straight ahead, with a multi-function luminaire above their head and recessed general ambient luminaires in the adjacent guest area.

Line of sight is important – the relationship of viewers to luminaires will result in multiple UGR values, as shown in the application example below, where:

Luminaires	UGR (Average) at 3.5′ AFF	Observer Position
A-1-1000 lm+C-Ambient-7000 lm (shown below)	11.95	Patient Viewpoint from right to left across room, in example below
	11.77	Guest Viewpoint from top to bottom towards bed, in example below
A-1-1000 lm+C-Exam-14,280 lm	11.02	Patient Viewpoint
	13.39	Guest Viewpoint

Type A-1 is the BalancedCare Flexible Ambient 1×1 (BCFA) and Type C is the BalancedCare Multi-Function 2×4 (BCMF24).

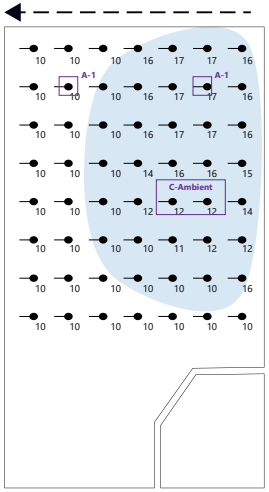


Figure 1: *calculation results in UGR of 11.95 from patient viewpoint (Ambient mode shown).*

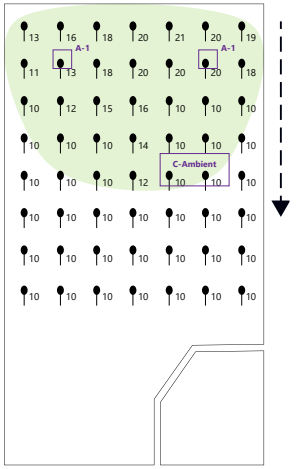


Figure 2*: calculation results in UGR of 11. 77 from guest viewpoint (Ambient mode shown).*

HOW IS IT CALCULATED?

Software programs such as AGi32 and Dialux can calculate UGR values – average, max and min – based on this formula

$UGR = 8 \log [0.25/Lb * \sum Ls2*\omega/\rho 2]$ that factors in:

- background luminance (cd/m^2)
- luminance of the apertures of each luminaire in the direction of the observer's eye (cd/m^2)
- solid angle of the luminous parts of each luminaire at the observer's eye (sr)
- displacement of luminaire from line of sight

WHAT DO THE NUMBERS MEAN?

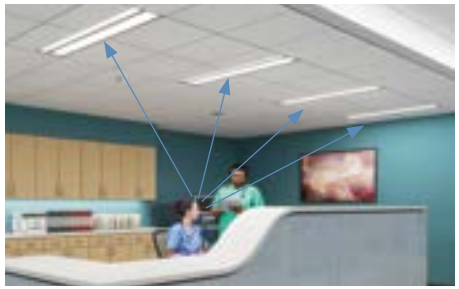
Values are given in the range of 10-30, lower is better; 16 is considered perceptible, 19 just acceptable; above 19 it becomes more uncomfortable. The table below compares UGR values with corresponding 7-step discomfort glare criteria (developed by R.G. Hopkinson).

While these numbers are an indication, it is important to remember that interpretations of glare are subjective, as each person's perception differs.

UGR	Discomfort Glare Criterion
10	Imperceptible
13	Just perceptible
16	Perceptible
19	Just acceptable
22	Unacceptable
25	Just uncomfortable
28	Uncomfortable

Factors Contributing To High UGR, In General:

- Lumen package – increased lumens could mean higher UGR
- Larger room sizes – more sources in field of view
- Lower ceiling heights, which indicate lower mounting heights
- Luminaire distributions with high angle brightness
- Lower surface reflectances
- Luminaire aperture size
- Spacing – farther apart could mean higher UGR
- Relationship of luminaire (max candela angle) to observer's line of sight



UGR considers reflectances of surrounding room surfaces, and luminaires within a person's line of sight that may cause them to sense glare

Single luminaire values are possible, but they do not tell the whole story

Although it is misleading to assign a UGR value to a single luminaire, for those seeking that number Photometric Toolbox *calculates for uniform arrays of luminaires, based on a single IES file*. It sorts results into a table of 190 individual calculations based on an assortment of 19 common room shapes and five combinations of surface reflectances for two observer positions.

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