



RETAIL LIGHTING DESIGN GUIDE





Lighting is a critical factor in creating a unique shopping environment: one that attracts customers and pulls them in, creates a store personality while reflecting brand and identity. Successful retail lighting does not come in a one-size-fits-all package; it is a strategic blend of color, contrast, control, and energy efficiency. More than application knowledge and experience, it requires proper application and lighting techniques utilizing the latest lamp and luminaire technology. A customer that is excited about their shopping experience will stay longer, spend more money, and not only be more likely to return, but enjoy coming back.

ConTech Lighting will guide you through the retail lighting process and be your lighting resource. Uniquely qualified to fulfill your retail store lighting needs, ConTech manufactures a variety of lighting systems including track, recessed, and decorative that keep stores fresh and up-to-date. It takes time and effort to ensure that your investment in lighting will be returned to the bottom line, and it's a partnership we'll be involved with every step of the way.

RETAIL LIGHTING DESIGN GUIDE

| | |
|---------------------------------|----|
| Goals of Lighting Design | 5 |
| Color, Reflection, and Contrast | 7 |
| Layers of Light | 11 |
| Application Solutions | 15 |



GOALS OF RETAIL LIGHTING DESIGN

The quantity and quality of illumination, the impression it creates about the merchandise and the effect it has on the retail area's appearance are all factors in a successful lighting design. A designer must consider a variety of key characteristics when developing their lighting plan including lamp life, system efficiency, lumen maintenance, color rendering and appearance, daylight integration and control, light distribution, points of interest, cost, system control and flexibility.

- Attract customers; pull them into the store and guide them through, safely and effectively
- Make a statement: reinforce brand and identity, give an impression about image and price range
- Create an aesthetically pleasing shopping environment; provide a sense of comfort and well-being for the customer
- Show off the merchandise: highlight features and displays, enhance colors, textures and forms while avoiding glare
- Promote merchandise and merchandise evaluation to initiate purchases
- Enable completion of a sale
- Reduce energy costs

With the growth and advances in technology, such as smart phones and tablets, the customer journey doesn't always begin and end in a store; brand, image, and shopping experience matter more than ever. Lighting helps to convey a specific retail message; it sets client expectations on the quality of merchandise as well as the overall motivation to make a purchase. Choosing the right lighting is critical for projecting the desired store image, focusing and attracting customer attention and enhancing the appeal of merchandise, leading to purchase. Lighting solutions vary depending on the target market, store concept and brand image; and the best lighting will set you apart from competitors.

A well-illuminated store directly contributes to the bottom line. Instead of increasing brightness in shops, and therefore also energy consumption, use lighting that is high-contrast, makes perception easier, and heightens levels of attention.

Diffused general lighting provides a sense of well-being, while vertical illuminance makes orientation easier in a space. Detailed accent lighting improves the perception and attractiveness of the goods displayed. The sales floor is where the brand comes to life, goods must be shown as true-to-life as possible using a high CRI light source and a well-balanced mix of light.

Products, offers, and displays change frequently in a retail setting, therefore lighting systems should be highly flexible, enabling a fresh, up-to-date appearance.



COLOR, REFLECTION, and CONTRAST

There are a number of factors to consider when lighting a retail space: the merchandise on display, the size and shape of the space, the intended audience, and the intended message the brand conveys. Many elements come into play, such as color, reflection, contrast, and energy efficiency, that make a retail lighting design successful.

Two units of measure are used defining light source color properties: Correlated Color Temperature (CCT) and Color Rendering Index (CRI).

Retail lighting must have great color; choosing light with the right color temperature and CRI is crucial. Lighting is a key factor in projecting and supporting store image; not only enhancing the look and appeal of merchandise, but affecting the feeling of the space itself.

All light sources are not equal. Two white light sources may look the same, but can render colors differently or provide a different feel to the space. By using lamps of the same Correlated Color Temperature and with the same, or very similar, Color Rendering Indices, the space will have even, consistent illumination throughout.

Reflection and glare are both useful and potentially harmful to retail lighting; they can attract the eye to merchandise when used properly, but irritate and annoy when used incorrectly.

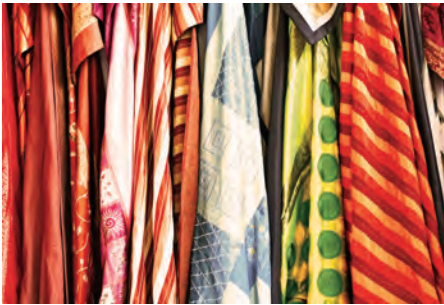
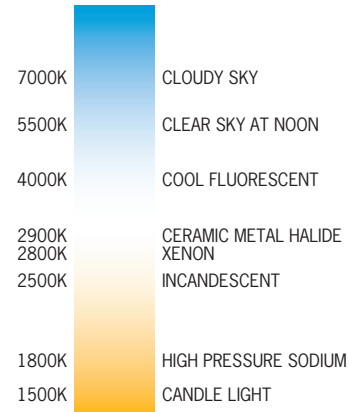
Using luminaires with good glare reduction values avoids direct glare and disturbing reflections on specular surfaces, such as glossy fixtures, register screens and PIN pads.

A very bright store is not the most effective lighting solution. Using contrast to highlight merchandise and different areas of the space, helps customers feel more comfortable and draws attention to featured merchandise.

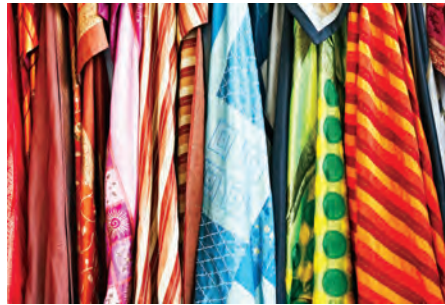
CORRELATED COLOR TEMPERATURE

Correlated Color Temperature, or CCT, is a measure of a lamp's color appearance when lighted. All lamps are given a color temperature based on the color of the light emitted. White light falls into three general categories: warm, neutral and cool, measured in Kelvin (K). White light with a hint of yellow-like candlelight is called "warm white" (below 3000K); it enhances reds and oranges, dulls blues, and adds a yellow tint to whites and greens. Neutral white (3000K – 3500K) enhances most colors equally, and does not emphasize either yellow or blue. Bluish white, like moonlight on snow, is considered "cool white" (above 3500K); enhancing blues, dulls reds and imparts a bluish tint to whites and greens.

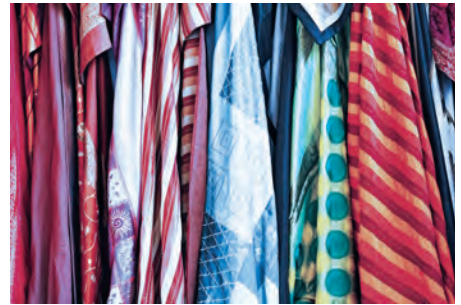
Warm light makes a space feel smaller, more comfortable and familiar, where cooler light make areas appear more spacious. Neutral light improves the feeling of well-being, which may extend the amount of time the customer spends in the store, leading to a purchase.



WARM



NEUTRAL



COOL

COLOR RENDERING INDEX

Color Rendering Index, or CRI, is a measure of how a light source renders colors of objects compared to how a reference light source renders the same colors. CRI can be used to compare sources of the same type and CCT.

A palette of specific colors is used, and the CRI calculation is the difference between each color sample illuminated by the test light source and the reference source. The group of samples is averaged, and a score between 0 and 100 is calculated, with 100 being the best match between light sources.

The higher the CRI of a light source, the better – and more natural – colors appear. For products to be presented in a true-to-life way, which increases a store's credibility, a CRI value of 80 – 100 is recommended.

| | APPEARANCE |
|-----|--------------------------|
| R1 | Light Grayish Red |
| R2 | Dark Grayish Yellow |
| R3 | Strong Yellow Green |
| R4 | Moderate Yellowish Green |
| R5 | Light Bluish Green |
| R6 | Light Blue |
| R7 | Light Violet |
| R8 | Light Reddish Purple |
| R9 | Strong Red |
| R10 | Strong Yellow |
| R11 | Strong Green |
| R12 | Strong Blue |
| R13 | Light Yellowish Pink |
| R14 | Moderate Olive Green |



Low CRI



High CRI

REFLECTION

MATERIAL REFLECTANCE PERCENT

Diffuse: Uniform surface brightness

| | |
|------------------------|-------|
| Limestone | 35-60 |
| White Paint | 75-90 |
| White Structural Glass | 70-80 |

Spread: General diffuse reflection

| | |
|------------------------------|-------|
| Brushed Aluminum | 55-60 |
| Etched Aluminum | 70-82 |
| Processed Aluminum (Diffuse) | 70-80 |
| Satin Chrome | 50-55 |

Specular: Directional control of brightness at specific angles

| | |
|-----------------------------------|-------|
| Chrome | 60-65 |
| Metal coated plastic | 75-95 |
| Mirrored and optical coated glass | 80-95 |
| Polished aluminum | 69-70 |
| Stainless Steel | 55-65 |

Reflection of light off of the various surfaces within the space should be accounted for in the lighting design. When surfaces with a higher reflectance are used, light is reflected back into the space, and higher illuminance levels are created. Light reflectance is based on a scale of 0, total surface light absorption, to 100, total light reflection.

Spread reflection materials, such as brushed aluminum, have a high, though diffused, reflection, reflecting 5-10% of light. Diffused reflection materials, as simple as a white painted wall, give a uniform brightness, and are good reflecting backgrounds for coves and smaller spaces. In addition to reduced energy costs, white and light-reflective surfaces help reduce shadows from racks and stacked goods.

CONTRAST RATIOS

Retail environments need to make the patrons feel comfortable while highlighting important merchandise and store areas. Simply increasing brightness is not only a waste of electricity, but is also not effective. Bright stores with lots of glare make customers uncomfortable and less likely to return. The key is layering light and using contrast throughout the space.

There are four basic layers of retail lighting: General lighting, also called ambient, accent lighting, task lighting, and decorative lighting. Measured in footcandles, the IESNA has illuminance level recommendations based on the type of lighting, the type of space, the type of customer, and how the lighting will be used (Page 14). By layering these light types, depth and dimension is added to the space.

Contrast is achieved by using an increased illumination within the different types of light, commonly task and accent, to emphasize featured merchandise against the general light levels. Contrast can be used to create visual hierarchies within the retail environment, enabling attention to be drawn to and focused on certain merchandise based on the contrast ratio. For example, a 2:1 contrast ratio, with the accent lighting being two times brighter than the general lighting level, creates a barely recognizable contrast. Whereas a 30:1 contrast ratio will create a strong focal effect on the focal items.

Each type of lighting has many options, and by incorporating the recommended light levels and contrast ratios, the end result is a space with high visual interest, depth, and dimension.

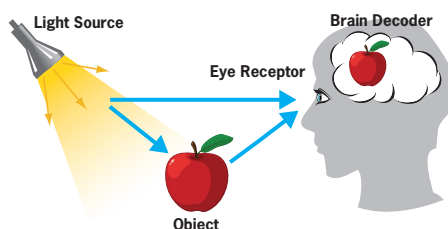


2:1 Ratio



30:1 Ratio

OPTICAL PERFORMANCE



Performance requirements for lamps and integrated luminaires:

1. Visual appearance of light on a surface
2. Numerical performance, light level, and efficiency
3. Visual appearance and glare control of the luminaire itself

The North Face Expeditions

A HERITAGE OF EXPLORATION

1978
The North Face Everest Expedition

1998
The North Face South Pole Expedition

1980
The North Face Annapurna Expedition

1989
The North Face Himalayas Expedition

1997
The North Face Everest Expedition



WOMEN'S A5 SERIES



LAYERS OF LIGHT

There are four layers of light typically used in retail lighting: general (also called ambient) lighting, task lighting, accent lighting, and decorative lighting. Combining and balancing these lighting types gives visual interest to the space and creates a more attractive, exiting and inviting environment.

GENERAL LIGHTING

General lighting is the main source of illumination in a space. This uniform, base level of lighting can easily become the focus of energy reduction, as the light levels from other fixtures can be lowered, especially when using LED sources.

Recommended light levels for general lighting is 30 - 50 foot-candles. With minimal illumination of the merchandise, general lighting allows the staff to perform daily tasks such as cleaning and re-stocking, as well as customer circulation throughout the space. Diffused general lighting ensures a sense of well-being, which makes customers feel comfortable and more likely to stay longer in the store. A simple way to achieve this is by arranging recessed fixtures using reflectors, baffles, and lensed trims in overlapping positions.

Perimeter lighting, or wall washing, helps define merchandising spaces, provides vertical lighting and makes the retail space feel larger. Done with sconces or wall washers, vertical lighting creates a pleasant, welcoming environment and adds to the visibility and visual impact of the displays on the walls. It is important that vertical surfaces are lit for visual comfort, spaciousness and visual and directional cues. Vertical brightness influences the customers' impression of the store by making orientation easier, helping to define merchandising spaces, and aiding in making the space's appearance to be larger, open and more welcoming for the consumer.

TASK LIGHTING

Task lighting is used to illuminate an area for a specific task; providing a focused, localized, and higher level of illumination. Necessary to the functioning of a space, it is important to use energy efficient sources to reduce operating costs.

Task lighting is most effective when used as a supplement to general lighting in workspaces, conference areas and on counter tops. Effective task lighting should eliminate shadows on the specific illuminated area, while preventing glare from the lamp or off surfaces.

Completing the sale is the most important retail task; it is the final interaction between the customer and staff. Pendant luminaries

at the point of sale are a great way to provide task light for sales work; enabling staff to quickly and accurately wrap packages, run register sales and credit card transactions, minimizing mistakes and returns. Recommended light levels for task areas are 50 – 200 footcandles. When lighting a task area, take into account the difference in brightness, or contrast, between the task area and the surrounding space. A 3:1 ratio of task lighting to general illumination provides a nice contrast for evaluating merchandise, reading tags, labels, or packaging and reading signs that identify store departments. The amount of light needed on the task, or luminance, is usually the most flexible variable of task lighting, and can be increased to compensate for low contrast levels.

ACCENT LIGHTING

Accent lighting creates a dramatic emphasis on merchandise using a focused, or point, light source or sources. It adds depth, contrast and creates a focal point for merchandise to be displayed; it highlights shape, texture, finish and color of merchandise, drawing customers to it. If this light is directed ambiguously, the end result may have many unwanted shadows obstructing the details of the highlighted merchandise as well as distracting glare.

The key is to make this illumination more precise and of higher intensity than the surrounding ambient light. Track fixtures, recessed housings with adjustable trims and concealed adjustable illumination with point source lamps provide directional control and are especially effective for accent lighting. They are

easy to aim precisely to highlight products' best attributes and influence the customers' impression. Accenting everything and emphasizing nothing is a common mistake with accent lighting; always keep in mind that there such a thing as providing too much light.

The IESNA recommends a 5:1 ratio of accent lighting to ambient light to make merchandise stand out and create a significant visual effect; dark merchandise may require a higher ratio to bring out detail. Recommended light levels for accent lighting are between 150 – 500 footcandles. For feature displays, higher ratios of 15:1 or 30:1 are used, especially to create sparkle in jewelry or crystal.



DECORATIVE LIGHTING

Decorative lighting serves a dual purpose: not only to contribute to the lighting layers in a retail environment, but also to enhance the look of the space as a design element. Decorative lighting includes pendants, sconces, chandeliers, table and floor lamps, and cylinders. Decorative lighting should complement and add visual interest to the interior, as well as provide or contribute to the overall lighting plan.

Pendants should be mounted 8 - 12 feet above the finished floor (a.f.f.) so they are still within view, but not too low as to deter the shopping experience. Pendants displayed over counters should be hung 36 - 48 inches above the horizontal plane so customers can peer into the glass without being hindered by the luminaire.

Wall sconces and wall mounted cylinders should be mounted approximately 5-1/2 feet a.f.f.; this helps to create a sense of human scale, especially in a large space.

Adding décor, beauty and style using decorative lighting is also an important reflection of a store's brand image, and reinforces the theme and style of the space. Decorative lighting can also contribute a feeling of hospitality and comfort to the retail experience, putting shoppers at ease and encouraging a longer visit, which can potentially lead to more sales.

By combining and layering these lighting types, your store environment will be more attractive, exciting, and inviting.

Reese's

TIMES SQUARE

HERSHEY'S

TIMES SQUARE

HERSHEY'S

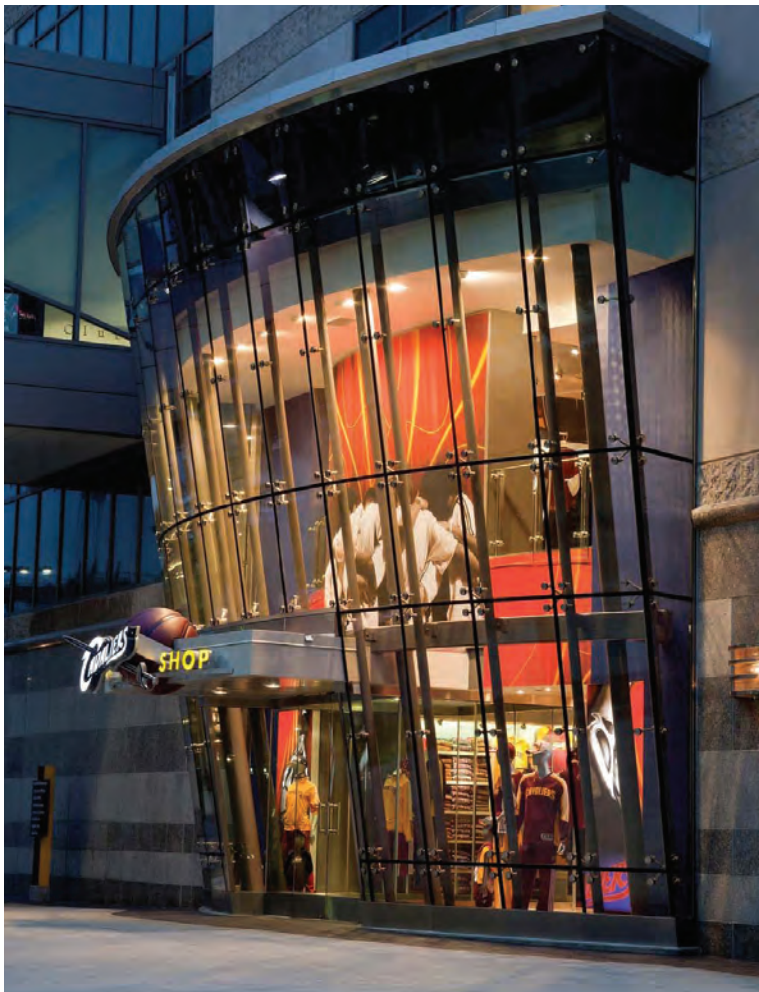
ORIGINAL
HERSHEY
AUTOMATIC
&
GRAVITATIONAL
CHOCOLATE MACHINE





APPLICATION SOLUTIONS

There are many factors to achieving great retail lighting design; the end goal is to increase sales. Using lighting intelligently to enhance merchandise and create a feeling of well-being for the customer increases the propensity to make a purchase. At ConTech, our goal is to create a balance between lighting effect, affordability and adaptability. We offer a wide range of fixture options to optimize the appearance of merchandise, while minimizing ongoing operating cost.

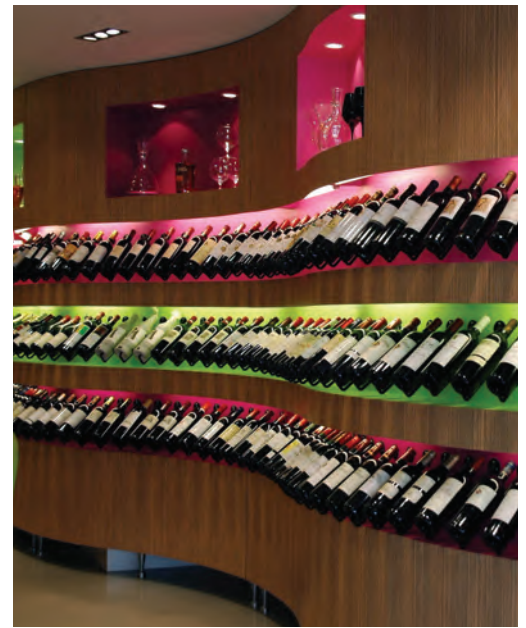


WINDOW LIGHTING

Every retailer is competing for the customer's attention; the retail window is an opportunity to stand out. It should be a powerful attraction, providing a link between the passersby and the merchandise within the store. Attract customers with drama; engage the passerby with intense white light using uniform saturated illumination, direct accent lighting to highlight and to define the merchandise, create stopping power that will make consumers want to come inside and invest themselves in the sales experience.

An energy-efficient lighting solution often overlooked in retail spaces is daylight, which adds another dimension to the overall lighting design. Understanding how the natural light interacts with the space can improve the visual appeal of merchandise. The window lighting should change depending on the time of day. During daylight hours, strong accent lighting focused on displayed merchandise will attract more attention. At night, using a low ambient lighting level, in addition to the strong accent lighting, will peak viewer's interest.

The entrance requires a high brightness to compete with the surrounding light, and under canopy lighting needs added degrees of protection. The brightness must be distinctly clear from the outside and from greater distances, as there will be no second chance at creating that first impression. The quality of the entrance dictates your potential customers further action, whether to enter or not.



SHELF, CASE & COUNTER LIGHTING

The most common way to light these spaces is to use small sources – such as LED tapelight – close to the display objects, but hidden from view. It is imperative to showcase products creatively to boost their appeal. Illuminance levels should be 3-5 times higher than the surrounding ambient light, highlighting merchandise for easy evaluation by the customer.

The light source color temperature and CRI must be chosen carefully as to not distort, damage or alter the look of the merchandise being displayed. The way that the light is directed onto shelves is crucial: backlighting shelves can produce a more attractive effect than only using accent lighting to highlight the merchandise. Lower level shelves go relatively unnoticed, but by targeting accent lighting and/or backlighting on the lower third of shelves, customers linger longer, encouraging sales.

RACK LIGHTING

Rack lighting attracts customers to, and allows easy evaluation of, merchandise. The lighting system should accomplish two things: fully illuminate the merchandise and accurately display color and texture. With constant changing display needs, it is important to keep this system flexible. ConTech track lighting

systems are ideal, as fixtures can be added, removed or moved without having to shut power to the track. Illuminance levels on merchandise should be at least three to five times higher than the ambient surrounding levels.



FITTING ROOM LIGHTING

Quality dressing room lighting is imperative because this is where the majority of buying decisions are made. High quality light with a high color rendering index should be used to provide form and texture to merchandise and make colors appear natural and realistic; the color of the merchandise should render the same in the fitting room as it did on the sales floor. Using lamp sources with similar CRIs and CCTs will make things look consistent between the two spaces.

Most fitting rooms are illuminated by overhead fluorescent luminaires. Instead, combine diffused and directional light sources with a good CRI to provide flattering light. This will make both the customer and your merchandise look their best. Proper fixture placement is essential for elimination of shadows, especially when viewing images in mirrors. The customer, not the mirror should be illuminated.

Using energy saving lighting technologies in fitting rooms has an added benefit: they radiate less heat. This reduces the cooling load and helps to make dressing rooms more comfortable, as well as lowering overall energy costs.



EXIT & EMERGENCY LIGHTING

ConTech offers a variety of high quality exit and emergency lighting fixtures to suit your space. When general lighting systems fail, exit and emergency lighting direct the safe exit of the building's occupants. If no exit is required, the lighting should provide security and comfort until the general lighting can be restored. ConTech's exit and emergency fixtures are tested to the highest safety standards; meeting or exceeding NFPA101, NEC and UL294.



IESNA ILLUMINANCES¹

| Areas/Tasks | Description | Type of Activity Area* | Illuminance (FC) ² |
|---|---|------------------------|-------------------------------|
| Circulation | Area not used for display or appraisal of merchandise or for sales transactions | High Activity | 30 |
| | | Medium Activity | 20 |
| | | Low Activity | 10 |
| Merchandise (Including Showcases and Wall Displays) | That plane area, horizontal to vertical, where merchandise is displayed and readily accessible for customer examination | High Activity | 100 |
| | | Medium Activity | 75 |
| | | Low Activity | 30 |
| Feature Displays ³ | Single item or items requiring special highlighting to visually attract and set apart from the surround | High Activity | 500 |
| | | Medium Activity | 300 |
| | | Low Activity | 150 |
| Show Windows | | | |
| Daytime Lighting | | | |
| General | | | 200 |
| Feature | | | 1000 |
| Nighttime Lighting | | | |
| General | | | 100-200 |
| Feature | | | 500-1000 |

*One store may encompass all three types within the buildings.

High Activity: Merchandise is usually displayed in bulk and is readily recognizable as to its use. Evaluation and viewing time is short. Minimal sales assistance and few customer amenities are available. Included in this category are mass merchandisers, warehouse sales, grocery and discount stores, auto parts departments, and hardware departments.

Medium Activity: Merchandise is familiar, but the customer may require time or help in evaluation of quality or usage or in the decision to buy. Some sales assistance and customer amenities are available. Included in this category are department and specialty stores.

Low Activity: Merchandise is generally exclusive, of the finest quality and highest price. Personal services and premium customer amenities are expected. Shopping is generally unhurried. Included in this category are fashion boutiques, designer signature shops, jewelry stores, fur salons, and fine art galleries.

1. IESNA Lighting Handbook, 8th Edition

2. Maintained on the task or in the area at any time.

3. Lighting levels to be measured in the plane of the merchandise.

WHAT SETS US APART

INNOVATION

We combine the latest energy efficient technology and design styles to create an extensive range of attractive and sustainable luminaires. We have over 5,000 products, including many high performance products that can't be found anywhere else. Our EcoTechnology solutions offer sustainable energy solutions that meet the qualitative needs of the visual environment with the least impact on the physical environment.

SUSTAINABILITY

At ConTech Lighting, our commitment to the environment is as important as our commitment to innovation, quality and our customers. We believe that lighting can be environmentally responsible and energy efficient, while providing high-quality performance and outstanding aesthetic design. EcoTechnology applies to our daily operation as well as to our products; from materials, manufacturing and transportation to the disposal process for our products and by-products.

QUALITY

We use the best components and manufacturing methods resulting in the highest quality fixtures. From cast housings and high performance reflectors, to the testing of each ballasted fixture before it ships, ConTech Lighting is defined by its quality. For consistency, we use only the most reliable LED chip makers including Cree, Nichia, Lumileds, Bridgelux and Sharp.

SERVICE

Our responsive, personalized customer focus, and market expertise represents an oasis of outstanding service in an industry that values it, but frequently doesn't receive it. We are here for you, live and in person, Monday through Friday 7:30am – 5:30pm CST.

PRODUCT AVAILABILITY & SPEEDSHIP™

Our products are in stock and ready to ship. Our unique SpeedShip™ process helps us toward our goal of shipping 100% of placed orders within 48 hours; at no additional cost to you.

MARKET EXPERTISE

Each market has its own unique lighting challenges. Designs can get tricky, having to verify every fixture, test every connector and make certain that every length of track is just right. We have an experienced staff of sales professionals to assist you with your projects from concept to completion.

LIGHTING EXPERIENCE

Lighting is more than just numbers on a spec sheet. Visit one of our facilities near you to experience the power of light to make your space more productive, more aesthetically pleasing, and more energy efficient. Visit our corporate Inspiration Center in Northbrook, Illinois, or one of our Leviton LIVE centers in San Francisco, California or New Orleans, Louisiana.



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