SUPERMARKET LIGHTING DESIGN GUIDE

CONTECH LIGHTING | a LEVITON company


Flower Market
EXIT

Grocery stores are focusing on better design. Lighting plays a key role in creating the drama and excitement found within the specialty departments: produce, deli, seafood, bakery, wine and floral. These areas give merchants the opportunity to showcase goods that become impulse purchases and distinguish their store from the competition.

ConTech Lighting manufactures a variety of lighting systems including track, beam, and recessed that keep stores looking fresh and up-to-date. We will guide you through the lighting process and be your lighting resource. It takes time and effort to ensure that an 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.

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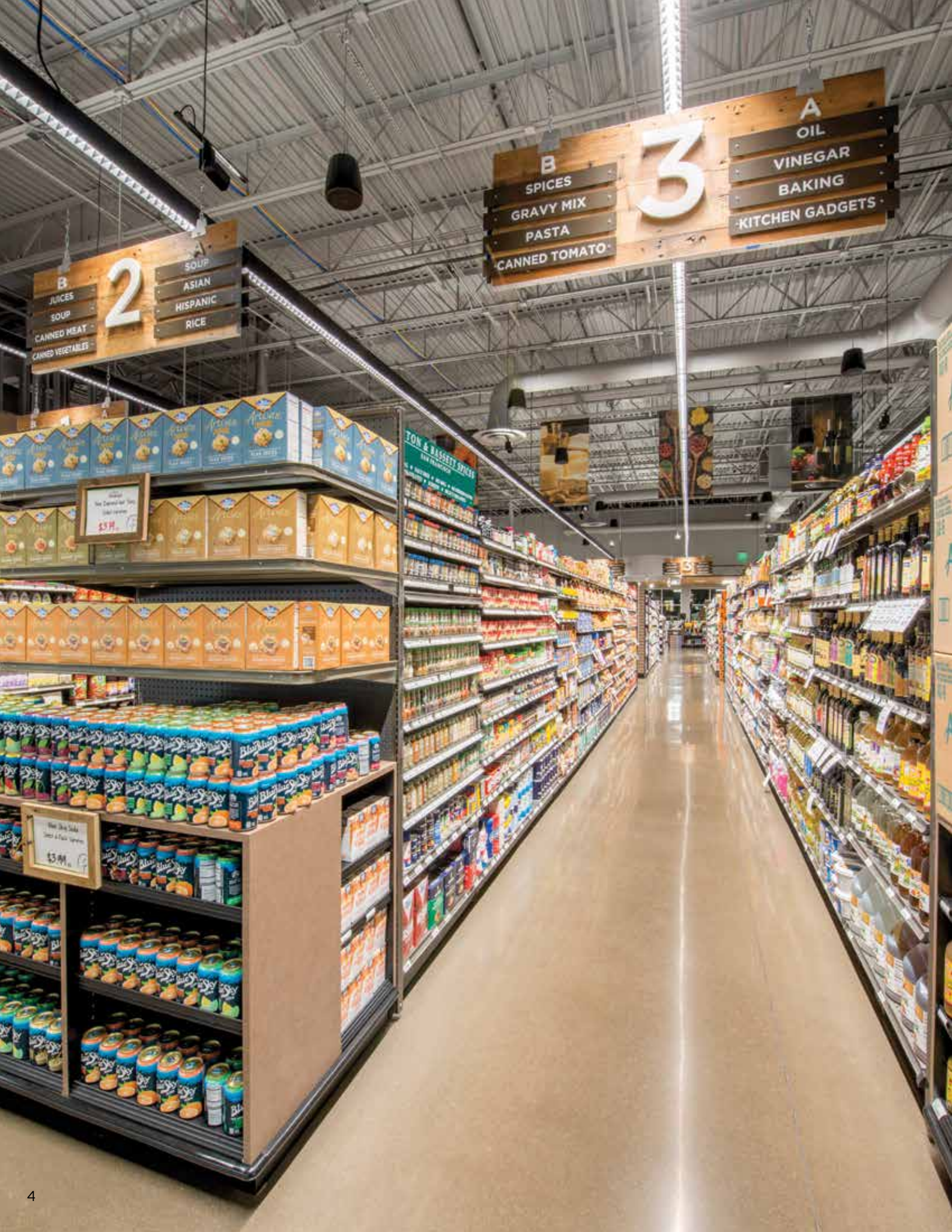
B
SPICES
GRAVY MIX
PASTA
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A
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BAKING
KITCHEN GADGETS
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JUICES
SOUP
CANNED MEAT
CANNED VEGETABLES
2
SOUP
ASIAN
HISPANIC
RICE

GOALS OF SUPERMARKET 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.

- Make the store look bright and open with by using a natural looking light source.
- Establish a visually comfortable environment in which to evaluate merchandise.
- Provide a visual hierarchy to direct the shopper to "must see" items and specials.
- Create a signature appearance throughout the store.
- Reduce heat from lighting fixtures; especially in areas with perishable products.
- Lower maintenance and energy costs.


om The Oven
Ciabatta
Ciabatta

COLOR, REFLECTION, and CONTRAST

There are a number of factors to consider when lighting a retail space; 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).

Supermarket 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.

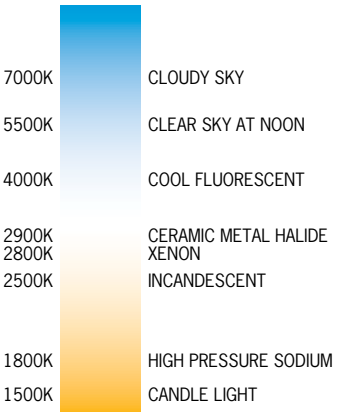
Using luminaires with good glare reduction values avoids direct glare and disturbing reflections on specular surfaces, such as glossy fixtures, register screens and PIN pads.

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

Supermarket 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.

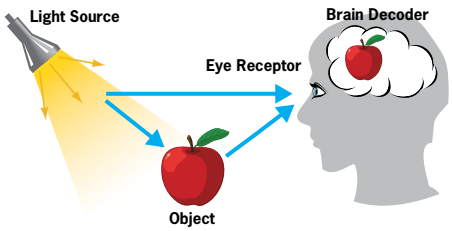
Contrast is achieved by using an increased illumination within the different types of light, commonly task and accent, to emphasize featured merchandise against the general light levels. Contrast can be used to create visual hierarchies within the retail environment, enabling attention to be drawn to 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


BULK
HONEY
nut butter

LAYERS OF LIGHT

There are four layers of light typically used in supermarket 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 lamp sources.

Recommended light levels for general lighting is 30 - 50 footcandles. 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 luminares 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.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APPLICATION SOLUTIONS

A well planned, well lit store helps customers find the items they need and makes them feel comfortable. It encourages them to stay and browse longer, which is key to them buying more. A flexible lighting system, such as track, is extremely cost efficient. Fixtures can be added, removed and redirected easily, without the added expense of a contractor, making it ideal to keep up with perpetually changing displays.

Store changes do not have to be extensive to have a big impact. By simply changing store lighting, you can create a dramatically different feel in the space.

PRODUCE DEPARTMENT

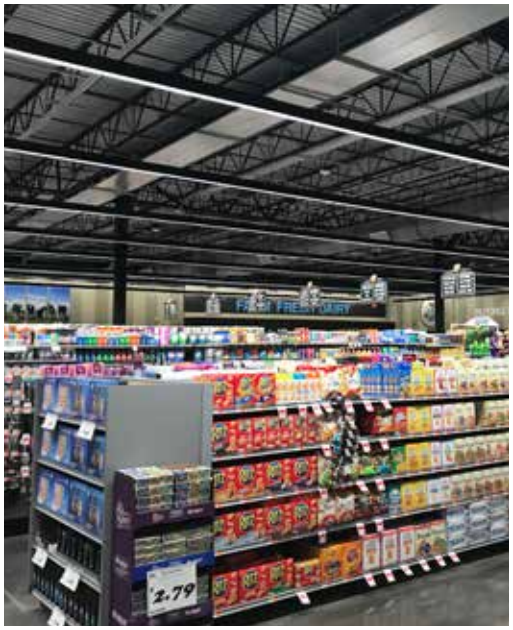
- Make center tables and displays as attractive and vibrant as the produce within the self-lit crisper cases.
- For a warm, comfortable feel, use 2700K LEDs with reflectors or tinted lenses which will accent red, orange and yellow colors.
- Mount fixtures 10' – 14' A.F.F. (Above the Finished Floor) for maximum effect.
- Position the Luxbeam track system in-line with the edge of the tables to eliminate shadows.
- Using LED sources, like Optica track fixtures, can lower cooling costs due to low waste heat levels. Since LEDs emit no UV or infra-red light, these sources help minimize produce spoilage.
- Limit or eliminate overhead ambient lighting fixtures to make the center of the department standout.
- LED lighting sources can last up to 50,000 hours, about 20 times longer than an incandescent bulb. ConTech Lighting offers many unique LED products that harness this energy efficient and durable technology.

FLORAL DEPARTMENT

- In order to maximize impulse purchases, a high contrast ratio is required; the floral area needs to be at least five times brighter than the surrounding areas. A ratio as high as 10:1 can be appropriate.
- Use sources that minimize heat on displays, such as LED.
- Limit or eliminate overhead ambient lighting fixtures to make floral merchandise pop.
- Install a track grid, such as Lux Beam, at 10' A.F.F. to make the department feel more intimate.
- To help cut energy costs, integrate daylight into the lighting plan. During the day, artificial light can play a supportive role in the overall lighting design.

OPEN TOP CASES

- Make the open top cases a destination by supplementing existing store lighting that has poor color properties.
- Mount the lighting system 10' – 11' A.F.F., centered to provide the proper spread of light into the cases.
- Match lamp color temperature to the surrounding area for a unified appearance.



AISLES

- Aisles take up the most amount of floor space in a supermarket.
- Lighting needs to account for customer navigation and product visibility.
- Linear lighting, mounted parallel to the shelving, is ideal for aisles; it provides both horizontal and vertical distribution, evenly illuminating both sides of the shelves while avoiding shadows.
- Using a light source such as LEDs to provide good color at a 2:1 ratio is recommended; this makes products "pop" and details on packaging easy to read.

END CAP DISPLAYS

- Draw customers to merchandise by creating a dramatic emphasis with a focused light source.
- End caps require a minimum 3:1 ratio of accent to ambient lighting to make merchandise stand out.
- Limit overhead general lighting fixtures in these areas to make displays more noticeable.
- LED sources have a different color appearance than general store lighting, which can help highlight merchandise.
- Recessed sources with adjustable aiming can be mounted above the ceiling plane, highlighting merchandise and reducing the visual distraction of fixtures.
- Choose the right fixtures and the right lamp. Incandescent lamps consume a lot of energy and burn out quickly. LEDs provide superior color rendering, are a brighter light source than incandescent and fluorescent, and offer significant energy savings.

LIQUOR DEPARTMENT

- Light sparkling off the bottles creates visual interest and intrigues shoppers so they will spend more time browsing the department.
- To avoid glare on the bottles, use low wattage lamp sources.
- For a high-end feel, design for low light levels and limit or eliminate general overhead lighting.
- Mounting ConTech's LED track systems at a lower height creates a relaxed, intimate environment.

STORE DECOR

- Define merchandising spaces, increase the comfort level in the store by making the space feel brighter and larger.
- Plan fixture mounting distance to control the intensity and spread of light from each fixture.
- Signs should be accented at a minimum 3:1 ratio of accent to general light levels to differentiate them from store décor.
- ConTech Lighting's Stealth LED track fixtures are fully aimable for highlighting walls, displays and signs.
- Recessed products provide a clean ceiling line and aren't distracting to the customer.
- Linear LEDs provide an even wash over large areas.
- ConTech Lighting offers a wide selection of exit and emergency lighting fixtures. Our exit lighting utilizes the latest in LED technology and are tested to the highest life safety standards; meeting or exceeding NFPA101, NEC, and UL924.


Money Orders
CLOSED
CLOSED
CROCK-POT
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CROCK-POT

IESNA ILLUMINANCES[1]

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 Medium Activity Low Activity	30 20 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 Medium Activity Low Activity	100 75 30
Feature Displays[3]	Single item or items requiring special highlighting to visually attract and set apart from the surround	High Activity Medium Activity Low Activity	500 300 150
Show Windows Daytime Lighting General Feature Nighttime Lighting General Feature			 200 1000 100-200 500-1000

*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.

CONTECH LIGHTING | a LEVITON company

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