

A Glossary of Lighting Terms

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A

AC

See alternating current

ADEX

Awards for Design Excellence (ADEX) is the largest and most prestigious awards program for product design of furniture fixtures (including light fixtures), and finishes. It is sponsored by Design Journal, the trade publication for interior designers, architects, and facility managers. Each category has potential for three award levels: platinum, gold, or silver. An anonymous panel of professionals representing a cross section of the design industry conducts all voting for the ADEX Awards.

ANSI

See American National Standards Institute

Accent Lighting

Lighting that is used to accent or highlight a particular object such as a work of art. To be effective accent lighting should be approximately four or five times the level of ambient light in the room, area, or space. House plants can be accented by aiming an uplight at the wall behind the plant, creating a dramatic silhouette of the plant against the wall.

Alabaster

Genuine alabaster is a very fine variety of crystalline gypsum (hydrous calcium sulfate) found in nature. It is translucent and its color is often white, pearly, or silky colorless but it, more often than not, has subtle reddish-brown bands of iron oxide running through it. It is often used for decorative objects such as light fixtures or figurines. Some light fixtures use faux alabaster, which is usually man-made glass. Both genuine and faux alabaster can be very attractive. The faux alabaster is generally much less expensive while real alabaster can lose some of its coloration over time. Real alabaster is expensive simply because quarrying it is costly and there is huge amount of waste when it is shaped, finished, and polished. Genuine alabaster is a minimum of 3/8in thick and weighs at least twice as much as imitations and has translucent and dark bands that are completely random in shape, size, and location. Since alabaster is a soft, porous stone it should be treated gently and never cleaned with detergents or abrasives. Instead, wipe alabaster with a

slightly damp (not wet), soft cloth. Furthermore, heating alabaster for long periods of time with a high-wattage light bulb may drive out the residual water in the alabaster and turn it completely white.

A-Line Lamp

The type of incandescent light bulb that is generally used in most indoor residential lighting applications. By January 1, 2014 the most common standard screw-base incandescent household (A-line) light bulbs will be phased out in the U.S. Clear, frosted, soft white, and daylight light bulbs will be phased out but specialty colors and shapes will not be. The new standards for these light bulbs are technology neutral so any technology that can meet the new energy-efficiency standards can be used - including fluorescent, halogen IR, high-efficiency incandescent, LEDs, and any technologies still to be developed.

Alternating Current (AC)

The flow of electricity (electric current) in a circuit that frequently alternates direction every second. In the USA, the standard frequency of alternating current is 60 Hz (hertz or cycles/second) and AC (as opposed to direct current) is generally the method for delivering electric power to homes and buildings.

Amalgam

An alloy of mercury which is an upgrade from traditional liquid mercury. Since it gives better mercury vapor control in the glass envelope the lamps that use amalgam perform better over a wider variety of temperatures and operating positions.

Ambient Lighting

General lighting that usually lights up an entire room or space.

American National Standards Institute (ANSI)

Founded in 1918, ANSI is a private, non-profit organization that sets guidelines and standards to be used in a variety of industries, including electrical for such devices as ballasts, lamps, and light fixtures (see www.ansi.org).

Amp

See ampere

Ampere (Amp)

A standard unit of measurement for electric current adopted in 1881. One ampere equals one coulomb of electric charge passing a given point in one second. Amperes are sometimes abbreviated as "amps" or simply "A" and are often

represented in electrical formulae by the letter, "I", as in $V = I \times R$ (volts = amperes x ohms). This unit is named after André-Marie Ampère, a French physicist, who lived during 1775-1836 and is considered to be the "father of electrodynamics".

Area Lighting

A landscape lighting term that refers to the lighting of large landscaped areas, usually with floodlights.

Argon

An inert gas used in incandescent and fluorescent lamps. In incandescent lamps argon retards the evaporation of the filament and, thereby, lengthens the average rated life of the lamp.

B

BF

See ballast factor

Backlighting

Lighting that illuminates an object from behind. The object to be illuminated is placed between the intended viewer and the light source. If the object is opaque, backlighting can cause the edges to "glow". With translucent objects (such as stained glass), backlighting illuminates the object by passing light through it. Backlighting is commonly used to accent artwork, photos, advertisements, or signage.

Baffle

In lighting this is usually a grooved surface that deflects and controls the "flow" of light to soften it and minimize reflected glare. Baffle trims (sometimes called step baffle trims or stepped baffle trims), made of plastic or metal, are often integral parts of recessed downlights. They are often colored a flat black to absorb some of the light but can have other finishes such as flat white, brushed copper, or brushed nickel.

Ballast

An electrical device used with fluorescent and HID lamps to supply sufficient voltage to start and operate the lamp but then limit the current during operation.

Ballast Factor (BF)

A ratio of the actual lumen output for a lamp using ballast to the lumen output for a lamp-ballast system under test conditions established by the American National Standards Institute (ANSI). The higher the ballast factor, generally the more wattage being used by the light fixture.

Barn Doors

Two or four adjustable opaque plates attached to the front of a luminaire, such as a track fixture or a theatrical spotlight, which are used to shape and focus the light on a designated area, such as a framed work of art or a stage scene

Base

The portion of a lamp (light bulb) that provides a means of physically and electrically connecting the lamp to a socket or lampholder within a luminaire

Basket Troffer

A troffer whose light sources are concealed by curved opaque shielding called "baskets", which are often perforated with a pattern of small holes. This type of troffer provides both direct lighting through the perforations and indirect lighting by bouncing light up from the basket and then off the upper light-colored opaque parts of the troffer.

Bayonet Base

A type of lamp base with pins that serve to lock the lamp into slots in the lamp socket of a luminaire. The bayonet base got its name from the method used by soldiers to mount bayonets on their rifles.

Beam Pattern

Synonymous with Beam Spread

Beam Spread

A measure of the spread of light from a reflectorized light source, a special-shaped lamp with a reflective coating inside the glass bulb to direct the light forward. The beam spread may be very narrow (narrow spot, NSP), very wide (wide flood, WFL), or something in-between (narrow flood, NFL, for example). Examples of "reflectorized light sources" are MR11, MR16, PAR20, PAR30, PAR38, R40, ER30, and BR30 lamps.

Binning

The process of sorting LEDs into a variety of groups based on certain performance characteristics such as color temperature and lumen output. LED manufacturers use binning to manage the slight variations that arise in LEDs during the manufacturing process.

Bollard

An outdoor luminaire that is a short (usually about 2-4 feet in height) but very sturdy vertical post with the light source located at or near the top. Bollards are typically used to light walkways in commercial settings.

Brick Light

A light fixture (usually the size of a brick) that can be recessed in a brick wall with its face parallel to the surface of the brick surface in order to light a walkway, a step, a landing, or a path.

Bulb

A colloquial term for a lamp. In the lighting industry, the term, bulb, refers only to the glass envelope of the lamp. Some lighting professionals contemptuously refer to "bulbs" as those things that are planted in the ground.

C

CBCP

See center beam candle power

CBM

See Certified Ballast Manufacturers Association

CCFL

See cold cathode fluorescent lamp

CCT

See color temperature

cd

See Candela

CFL

See compact fluorescent lamp

CIE

See Commission on Illumination

CQS

See color quality scale

CRI

See color rendering index

CSA

See Canadian Standards Association

Cable Lighting System

A low voltage lighting system where the mechanism holding the light fixtures and conducting electricity to those fixtures is a pair of taut parallel metal cables.



Canadian Standards Association

Like UL and ETL in the USA, the CSA is a not-for-profit membership-based association serving business, industry, government, and consumers in Canada and the global marketplace. It is an organization that works in Canada and around the world to develop safety standards that address real needs, such as enhancing public safety and health, advancing the quality of life, and helping to preserve the environment. (see www.csagroup.org/ca/en/services/codes-and-standards).

Candela

A unit of light measurement that refers to the luminous intensity from a light source in a specific direction.

Candlepower

An obsolete term that has been replaced by the candela, a unit of measurement that refers to the luminous intensity from a light source in a specific direction.

Cathode

An electrode that emits electrons. A fluorescent lamp cathode emits or discharges electrons to the cathode at the other end of the lamp.

Cathode Guard

A metal band encircling the cathode of a fluorescent lamp, used to collect the evaporating particles from the cathode, greatly reducing the end-blackening of the glass envelope.

Cave Effect

A lighting effect caused by parabolic recessed troffers with a high cut-off angle that leaves the upper part of the room's walls relatively unlit and noticeably darker than the lower part of the walls.

Center Beam Candle Power

A measure of the luminous intensity at the center of the beam of a reflector lamp measured in candelas.

Certified Ballast Manufacturers Association

An association that tests and certifies ballasts that match the standards established by the American National Standards Institute (ANSI).

Chandelier

A chandelier is often the focal point of the dining room. As such it should be hung approximately 30 inches above the tabletop and should be at least 6 inches narrower than the table on each side.

Circline

A type of fluorescent lamp that is made up of a circular tube of glass; when placed in a light fixture the ballast that powers this type of lamp is usually located in the center of the circline lamp.

Circuit

A pathway for the flow of electrons, including capacitors, resistors, and/or transistors, connected by wires through which electrical current flows. If there is only one path for the current, the circuit is called a "Series Circuit". If there are multiple paths, the circuit is called a "Parallel Circuit".

Cold Cathode

A cathode (an electrode that emits electrons) that is not independently heated.

Cold Cathode Fluorescent Lamp (CCFL)

A type of fluorescent lamp in which the cathode (an electron-emitting electrode inside the lamp) is not independently heated although the cathode can become quite hot once the CCFL has been operating. Screw-in CCFLs come in several different wattages (present range is 3W to 18W) and several different shapes (spiral, globe, reflector, A-line, torpedo) and are generally characterized by a very narrow glass tube envelope (2mm-4mm in diameter), a longer rated life than compact fluorescent lamps (often 25,000 hours), and a very good range of dimmability (down to 30%).

Colored Glass Filter

This term means that the glass is formed with the color in the glass as opposed to the color being coated on the surface (which is a dichroic filter). This is accomplished by mixing various metal oxides in the glass composition. These colored glass filters are primarily used for aesthetic purposes in lighting. They are not designed for the precise control of the spectral bands, as are optical color filters (dichroic filters).

Color Quality Scale (CQS)

An alternative to the Color Rendering Index (CRI). The CQS measures a light source's ability to render colors. The CQS was designed by the NIST to evaluate LEDs. The

scale uses 15 color samples of deeper color compared to the CRI, which uses 8 pastel colors.

Color Rendering Index (CRI)

A measure of a lamp's ability to render colors accurately. The scale ranges from 1 (low pressure sodium) to 100 (the sun). A CRI of 85 is considered to be very good.

Color Temperature

A measure of the color appearance or hue of a light source which helps describe the apparent "warmth" (reddish) or "coolness" (bluish) of that light source. Generally, light sources below 3200K are considered "warm;" while those above 4000K are considered "cool" light sources. The color temperature of a lamp has nothing to do with how hot the lamp will get or how much heat is given off by the lamp. The letter, K, stands for Kelvin. This term is also referred to as the Correlated Color Temperature (CCT).

Here is some information to help you better understand how color temperature can effect your mood and the best applications for certain color temps.

- 2700K - Friendly, Personal, Intimate - Home, Libraries, Restaurants
- 3500K - Friendly, Inviting, Non-threatening - New Offices, Public Reception Areas
- 4100K - Neat, Clean, Efficient - Older Offices, Classrooms, Mass Merchandisers
- 5000K - Bright, Alert, Exacting Coloration - Graphics, Jewelry Stores, Medical Exam Areas, Photography

Different types of lights sources produce particular color temperatures.

- 1600K - Sunrise or Sunset
- 1800K - Candlelight & Gaslight
- 2800K - Household Incandescent Lamp
- 3000K - Warm White Fluorescent Lamp
- 3500K - Neutral White Fluorescent Lamp
- 4100K - Cool White Fluorescent Lamp
- 5000K - Professional Light Booth
- 5200K - Bright Midday Sun
- 6500K - Heavily Overcast Sky

Commission on Illumination (CIE)

The International Commission on Illumination is a nonprofit that is "devoted to worldwide cooperation and the exchange on all matters relating to the science and art of light and lighting, colour and vision, photobiology and image technology." One

of the CIE's achievements is the development of the Color Rendering Index (CRI). (see www.cie.co.at)

Compact Fluorescent Lamp (CFL)

A generic name used for a whole family of small, single-ended fluorescent lamps with a folded, bridged, or spiral glass tube design and with high color rendering (CRI > 80) and a long life (> 8,000 hours). To learn more about this topic click CFL Information.

Control

A device that controls a lighting system. A control can take the form of a dimmer, switch, or an occupancy sensor.

Core and Coil Ballast

Another term for a magnetic ballast or electromagnetic ballast

Cornice Lighting

A lighting system comprised of light sources shielded by a panel parallel to the wall and attached to the ceiling and distributing light over and down the wall.

Correlated Color Temperature (CCT)

See color temperature

Coulomb (C)

The standard unit of electric charge, named after Charles-Augustin de Coulomb, a French physicist who developed Coulomb's law. A coulomb is equal to the charge transported in 1 second by 1 ampere.

Cove Lighting

A lighting system comprised of light sources shielded by a ledge or recess, and distributing light over the ceiling and possibly the upper part of the wall.

Cross Lighting

Illumination of an object from two light sources opposite of each other.

CSA

The Canadian Standards Association, like UL and ETL in the USA, is a not-for-profit membership-based association serving business, industry, government, and consumers in Canada and the global marketplace. It is an organization that works in Canada and around the world to develop safety standards that address real needs,

such as enhancing public safety and health, advancing the quality of life, and helping to preserve the environment.

Current

The rate of flow of electric charge in a conductor, which is measured in amperes or amps.

Cut-Off Angle

The position at which a viewer can no longer see the lamp in a fixture. The cut-off angle is measured from the base of the fixture to the point at which the lamp cannot be viewed. An angle of 45 degrees or less is considered "sharp", meaning the lamp is quickly hidden as one moves away from a fixture. The cut-off angle is important when considering glare.

D

DC

See direct current

Daisy Chain

See series circuit

Desk Lamp

A portable lamp that usually sits on a desk and provides task lighting for any work done on the desktop.

Dichroic Filter

A material that splits visible light into different wavelengths, allowing for precise control of the spectral band. Dichroic filters are coated on the glass and only allow certain wavelengths or colors to pass through. Dichroic filters are different from colored glass filters, which are used mostly for aesthetic purposes.

Dichroic Reflector

A reflector or filter that transmits certain wavelengths but reflects other wavelengths. In lighting fixtures, dichroic reflectors often transmit infrared light out of the rear of the fixture while reflecting visible light through the front, resulting in cooler visible light.

Diffuse

To spread out or scatter the light coming from light fixtures in order to "soften" it and minimize direct glare. This is often accomplished by using diffusers that are translucent in nature such as frosted glass, linear spread lenses, solite lenses, or spread lenses.

Diffuser

A transparent or translucent piece of glass, silicone, or plastic designed to control light by scattering or diffusing it in order to create softer light without much glare.

Dimmable

Any lighting product (light fixture or light bulb) that is designated as dimmable can be dimmed if the correct dimming device (such as a dimmer) is used to decrease or increase the amount of light that light fixture gives off.

Dimmer

A device in an electrical circuit used for varying the brightness of light bulbs in a lighting installation. Dimming controls are ideal for almost any type of room because they can change the amount of lighting to suit each mood or activity and they can help you look good. The use of dimmers with incandescent, xenon, and halogen light sources also increases the life of the lamps and decreases the use of electricity.

Direct Current (DC)

An electric current that flows in only one direction without changes, cycling or alterations. DC current is usually supplied by a battery, a DC transformer, or photovoltaic (PV) cells.

Direct Glare

A type of glare or excessive brightness that travels straight from a light source directly into the viewer's eye rather than being reflected off another surface (indirect glare). Glare hinders visibility and contributes to eyestrain. Direct glare can sometimes be attributed to a poorly designed light fixture, and a light fixture that produces an unusual amount of direct glare is sometimes called a "glare bomb".

Discharge Tube

A tube (usually made of glass) that contains gas or a metal vapor that ionizes when (voltage is applied, resulting in the emission of light. Many different gases are used in discharge tubes, including xenon, neon, argon, mercury, and sodium.

Double-ended Lamp

A lamp that has 2 bases or points of electrical and physical connection that provide extra stability in rough service applications.

Downlight

Picture of a downlight with white baffle trim
A small light fixture recessed into the ceiling that usually concentrates the light in a downward direction. Synonyms: recessed downlight, "can", recessed can, high hat, pot light.

Driver, LED

An electronic device that acts as the power supply for LEDs. A driver regulates the current in order to maintain steady lumen output and prevent variation.

E

EL

See electroluminescent

EPACT

See Energy Policy Act

ESL

See electron stimulated luminescence

ETL

ETL, like Underwriters Laboratories, Inc. (UL), is an independent, not-for-profit product safety testing and certification organization. Throughout its long history its name has changed several times. Thomas A. Edison established the Lamp Testing Bureau in 1896. In 1904 Edison renamed his Lamp Testing Bureau the Electrical Testing Laboratories (ETL). In 1977 ETL officially changed its corporate name to ETL Testing Laboratories and in 1996 ETL was renamed the Intertek Testing Services, Ltd. (NOTE: ETL Testing Laboratories, originally organized by the Edison Illuminating Companies, has been conducting electrical performance and reliability tests since 1896. Intertek Testing Services (ITS), which acquired ETL Testing Laboratories from Inchcape in 1996, is recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) just as Underwriters Laboratories (UL), the Canadian Standards Association (CSA) and several other independent organizations are recognized. A federal law passed in 1988 established the NRTL program to eliminate provisions that explicitly required or implied that product certification be performed only by standard-writing companies such as UL. Since each NRTL must meet the same OSHA requirements of competency, NRTLs recognized for the same product safety test standard are considered as equivalent in their capability to certify to that standard.) (see www.intertek.com)

Efficacy

A measurement of efficiency used to compare light output to energy consumption. Efficacy is measured in lumens per watt (similar to miles/gallon for a motor vehicle). A 100-watt light source that produces 1750 lumens of light has an efficacy of 17.5 lumens per watt (L/W).

Efficacy for certain light sources:

- Edison's first lamp - 1.4 L/W
- Incandescent Lamps - 10-40 L/W
- Fluorescent Lamps - 35-100 L/W
- Mercury Vapor Lamps - 50-60 L/W
- Metal Halide Lamps - 80-125 L/W
- High Pressure Sodium Lamps - 100-140 L/W
- Theoretical max for white light - 225 L/W

Electrode

An electrical conductor used to make contact with a nonmetallic part of an electrical circuit or light bulb (e.g., a semiconductor, an electrolyte, or the gases found in the glass envelope of a light bulb).

Electroluminescent (EL)

A phosphorous material that emits light or "glows" when current passes through it.

Electromagnetic Ballast

Synonymous with magnetic ballast

Electromagnetic Spectrum

An entire "spectrum" of radiant energy arranged by wavelength and frequency, including radio waves (long wavelength with low frequency), microwaves, infrared radiation, visible light, ultraviolet radiation, X-rays, and gamma-rays (short wavelength with high frequency).

Electron

A subatomic particle with a negative electric charge. Electricity is the movement of electrons in an electrical circuit.

Electronic Ballast

A type of ballast with electronic components that increases the standard operating frequency of electricity from 60 cycles per second (the U.S. standard) to 20 kHz (20,000 cycles/second) or higher. This increase in operating frequency is important for greatly reducing the stroboscopic effect or flickering that is associated with fluorescent lamps. Electronic ballasts are an improvement over magnetic ballasts because they are quieter, lighter in weight, and more efficient in converting electrical energy into light energy while producing less heat.

Electronic Transformer

A type of transformer that includes an inverter, which allows for a substantially smaller size compared to a magnetic transformer with comparable wattage. The inverter causes the current to alternate at a frequency of 20-50 kHz. The higher the frequency, the smaller the transformer can be. The transformer "transforms" line voltage (usually 120-277 volts) into low voltage (usually 12 or 24 volts). Light fixture manufacturers often incorporate built-in electronic transformers in the fixture design because of their small size. Note: due to its very high frequency the voltage of electronic transformers can not be measured with standard voltmeters; instead, a "true RMS" voltmeter with sufficient range should be used.

Electron Stimulated Luminescence

ESL is an entirely new, energy efficient lighting technology that uses accelerated electrons to stimulate phosphor to create light, making the surface of the light bulb "glow". It is not a type of incandescent, fluorescent, or LED light source. - an emerging light source that does not require filaments, plasma, or mercury to operate. Accelerated electrons travel over an area inside a phosphor-coated bulb, causing the surface to glow. The developer of this new technology, Vu1, claims the lamp is energy efficient, creates similar quality light of incandescent bulbs, and is much cheaper to produce than LEDs.

Elliptical Lens

Synonymous with linear spread lens

Elongated Lens

Synonymous with linear spread lens

Emergency Lighting

Lighting used when the normal lighting fails.

End Blackening

Darkening of the glass envelope around the ends of a fluorescent lamp caused by particles evaporating (literally boiling off) from the cathode and adhering to the glass. Fluorescent lamps made with cathode guards greatly reduce this occurrence.

Energy Policy Act (EPACT)

Energy legislation originally passed by the US Congress in 1992, and updated periodically, mandating labeling and minimum energy efficiency requirements for many commonly used lighting products like lamps and ballasts.

ENERGY STAR®

A government-backed program (a joint program between the U.S. Environmental Protection Agency and the U.S. Department of Energy) helping businesses and consumers protect the environment through superior energy efficiency. If a lighting product is ENERGY STAR® compliant, that means it has passed stringent testing by the government and is considered to be energy efficient. ENERGY STAR® qualified products can be identified by a label on the packaging. The U.S. Environmental Protection Agency has established the following guidelines for determining the product specifications necessary to qualify for the ENERGY STAR® label.

- Product categories must contribute significant energy savings nationwide.
- Qualified products must deliver the features and performance demanded by consumers, in addition to increased energy efficiency.
- If the qualified product costs more than a conventional, less-efficient counterpart, purchasers will recover their investment in increased energy efficiency through utility bill savings, within a reasonable period of time.
- Energy efficiency can be achieved through broadly available, non-proprietary technologies offered by more than one manufacturer.
- Product energy consumption and performance can be measured and verified with testing.
- Labeling would effectively differentiate products and be visible for purchasers.

ER Lamp

A type of incandescent reflector lamp with the reflector shaped like an ellipsoid (a 3-dimensional ellipse) with the lamp's filament located at one of the two foci of the ellipsoid so that the light is focused directly in front of the lamp at the second foci.

Eyeball Trim

A recessed trim (part of a recessed downlight) that can be rotated to point the light in almost any desired direction.

F

fc

See foot-candle

fL

See foot-lambert

Faceplate

The metal or plastic plate installed over an on/off switch, dimmer, or receptacle, which covers the wall opening and protects the wiring inside the junction box.

Fiber Optic

A type of transparent cable, usually made of plastic or glass, that transmits light. Fibers can be used in lighting to create distinct effects.

Filament

A tungsten wire that incandesces or lights up when an electric current passes through it.

Filter

A piece of plastic or glass designed to transmit a certain narrow range of light (wavelength) while reflecting or absorbing the wavelengths of light that are not transmitted. See colored glass filter and dichroic filter.

Flexible Track Lighting System

A low voltage or a line voltage lighting system where the suspended track (sometimes called a monorail) holding the light fixtures in place and also conducting electricity to those fixtures can be bent into creative shapes, sometimes to enhance or emulate the architecture of the space.

Floodlight

A broad-beamed high intensity light fixture.

Fluorescent Lamp

A low-pressure mercury electric-discharge lamp (light bulb) in which a phosphor coating on the inside of the glass tubing transforms some of the ultraviolet energy created inside the lamp into visible light.



Foot-Candle (fc)

The USA unit of measurement of lighting level (illumination or the amount of light reaching a subject) and sometimes spelled footcandle. The international unit of measurement of lighting level (illumination) is the lux (lx). The relationship between the lux and the foot-candle is $1 \text{ fc} = 10.76 \text{ lux}$.

Foot-Lambert

A unit of luminance in the USA which is now rarely used; the brightness of a surface which emits or reflects 1 lumen per square foot of its surface. The brightness of the face of an exit sign is sometimes reported in foot-lamberts.

Four-Way Switch

A wall switch that allows three switches to control one lighting system. Whenever you flip one of the four-way switches in a given circuit, the light changes its state; that is, if the light was on, it then turns off and if the light was off, it then turns on.

Framing Projector

A light fixture with a lens and adjustable shutters, which allow the fixture to "project" a beam of accent lighting with a variable size in order to light a well-defined area such as a hanging frame of artwork.

Frequency

The number of occurrences of a repeating event per unit of time - the number of times something occurs per unit of time. The standard unit for frequency is the Hertz, or 1 cycle per second.

Fresnel Lens

(Pronounced fray-nell) A special type of lens developed by the French physicist Augustin-Jean Fresnel for lighthouses. Compared to a conventional bulky lens, a Fresnel lens is much thinner, lighter in weight, larger, and flatter.

Frosted Lens

A white translucent lens that creates a soft (diffused) light.

G

Ganging

The technique of installing two or more on/off switches, dimmers or electrical receptacles side by side in one wall junction box.

Gel

A transparent, heat-resistant, colored piece of plastic that is used to add color to a light source and is often used in theatrical lighting.

General Lighting

Substantially uniform lighting of a space without providing for special local lighting requirements like task lighting or accent lighting.

Glare

Direct glare is caused by light coming directly to the eye from a light source. Indirect glare is light reflected from a surface in the direction of the eye. Both can harm vision and cause visual discomfort or disability.

Glare Bomb

A light fixture that obviously produces way too much glare.

Gobo

A thin metal stencil with a cut-out pattern that produces an image projected onto a surface when a light beam is directed through it.

Ground

An electrical connection that is literally connected to "ground" (the earth) directly or indirectly so that any spurious electrical current developing within the circuit or light fixture can pass to the earth harmlessly.

H

HO

See high output

Hz

See hertz

Halogen Cycle

A regenerative cycle of tungsten and halogen atoms, which helps minimize the evaporation of tungsten atoms from the filament of a halogen lamp and the blackening of the glass envelope during the life of the lamp.

Halogen IR Lamp

A type of halogen lamp that has a reflective dichroic coating on the inner glass bulb that reflects infrared (heat) energy back to the filament, causing an increase in the output of light without an increase in the wattage supplied to the lamp.

Halogen Lamp

A type of incandescent lamp (light bulb) that contains halogen gases (such as iodine, chlorine, bromine, and fluorine), which slow the evaporation of the tungsten filament. Also, sometimes called a tungsten halogen lamp or a quartz lamp. The glass envelope that surrounds the filament of a halogen lamp should not be touched with bare hands. The natural oil from human hands will only help to shorten the life of halogen lamps. If you should accidentally touch the glass bulb, you should thoroughly remove your fingerprints with methylated spirit (denatured alcohol).

Hardwired

Technically means that the light fixture is permanently connected to an electrical source. The light fixture is not hardwired if it gets power via a cord & plug.

Harp

on a portable lamp the metal frame that holds the shade in place - the metal wire component on a fixture that supports the lamp shade.

Heat Sink

A component found in well-designed LED light fixtures that lowers the temperature of the LEDs by dissipating their heat. Heat sinks are also found in other electronic devices such as computers and lasers. They are often made of aluminum and have grooves, fins, and sometimes a fan.

Hertz (Hz)

The standard unit of measurement for frequency (how many times something occurs in a unit of time), usually how many cycles occur in 1 second. Named after German physicist, Heinrich Hertz, the unit was first established in 1930. In lighting, Hz is the unit used to measure alternating current.

HID Lamp

See high intensity discharge lamp

High Bay Light Fixture

An indoor luminaire designed for and used in spaces with very high ceilings (25ft or higher) like factories, warehouses, and gymnasiums. Also see low bay light fixture.

High Intensity Discharge Lamp (HID Lamp)

A lamp that has a longer life and provides more light (lumens) per watt than most other light sources. HID lamps are available in mercury vapor, metal halide, high pressure sodium, and low pressure sodium types.

High Output (HO)

A fluorescent lamp designed to use high levels of current (800 milliamperes), which corresponds with an increase in lumen output. HO fluorescent lamps are able to operate at low temperatures (down to 0F) and still produce high light levels.

High Pressure Sodium Lamp (HPS Lamp)

A high intensity discharge (HID) light bulb that illuminates by radiation from sodium vapor producing a yellowish color rendering, when supplied with electricity from a ballast. This type of light bulb is often used in street lights and is available with clear or phosphor coated glass envelopes. Often abbreviated as HPS lamps they are considered to be quite efficient producing about 100 lumens/watt.

HIR Lamp

See halogen IR lamp

Household Wire

Picture of a non-metallic household electrical wire"Household wire" is the term that is sometimes used to refer to the "non-metallic sheathed electrical cable" that is used behind all of the walls and ceilings in a home to connect the electrical panel to switches, junction boxes, ceiling fans, electrical outlets, exhaust fans, and light fixtures. The term, "Romex" is often incorrectly used as a generic term to refer to any "non-metallic sheathed electrical cable" just like the brand name Kleenex is often incorrectly used to refer to any brand of tissue. ROMEX® is a trademark of the Southwire Company which refers to their specific brand of "non-metallic sheathed electrical cable". The non-metallic sheathing is the outside rubber insulation around the entire cable. The cable inside the sheathing is usually made up of 3 wires: one wire with white insulation (neutral wire), one wire with black insulation (power wire), and one copper wire with no insulation (ground wire). The size of the non-metallic sheathed electrical cable that is used to connect lighting fixtures in a home is usually described as "14/2 with ground" (although this may vary with geographical location). The "14/2" refers to the two insulated wires that are 14 gauge in size and the "ground" refers to the uninsulated copper wire.

HPS Lamp

See high pressure sodium lamp

I

IDA

See International Dark-Sky Association

IESNA

See Illuminating Engineering Society of North America

Illuminance

The total luminous flux incident on a surface per unit area; a measure of how much of the incident light illuminates the surface; measured in lux or foot-candles.

Illumination

See illuminance

Illuminating Engineering Society of North America (IESNA)

founded in 1906, the Illuminating Engineering Society of North America is a non-profit organization made up of lighting professional members that seeks to "improve the lighted environment by bringing together those with lighting knowledge and by translating that knowledge into actions that benefit the public." (see www.iesna.com)

Illuminator

A device that produces light for a fiber optic lighting system, which also is made up of fiber optic fibers and sometimes fixtures used at the ends of the fibers to direct the light in a specified manner. The light source used in an illuminator is usually an MR halogen lamp, an MR metal halide lamp, or an LED lamp.

Incandescence

Emission of visible light by any heated object (e.g., molten steel, a hot branding iron, or the filament of a lit light bulb).

Incandescent Lamp

A lamp in which light is produced by the passage of an electric current through a tungsten filament which is heated to the point of incandescence.

Indirect Glare

glare or excessive brightness reflected off another surface separate from the light source. Indirect glare, sometimes referred to as reflected glare, can be a reflection off a computer or television screen or even a magazine. Similar to direct glare, the light source should be considered when trying to prevent indirect glare.

Indirect Lighting

lighting that uses luminaires to direct most, if not all, of the light toward the ceiling or wall, providing soft, glare-free illumination without seeing the luminaire directly.

Induction Lamp

A special type of fluorescent lamp that uses electricity to generate an electromagnetic field that causes the gaseous mercury atoms inside the glass envelope to emit ultraviolet radiation, which in turn, is converted to visible light by the phosphor coating on the inside of the glass envelope. Induction lamps have no electrodes and, therefore, have longer rated lamp lives than standard fluorescent lamps because the deterioration of the tungsten filaments in a standard fluorescent lamp is usually the main cause of a fluorescent lamp to stop working.

Infrared Radiation

A type of invisible radiation for which the wavelengths are longer (about 770 nm to 1100 nm) and frequency lower than those for visible radiation (The visible spectrum is made up of red, orange, yellow, green, blue, indigo, and violet - ROYGBIV, for short.)

Initial Lumens

The luminous output of a brand new lamp.

Instant Start

Refers to fluorescent lamps that start instantly without pre-heating the cathodes and without the need for starters.

International Dark-Sky Association (IDA)

Incorporated in 1988, the International Dark-Sky Association is a USA-based, non-profit organization that is dedicated to eliminating light pollution (excessive artificial light) in order to protect ecosystems, save energy, and allow for a star-filled night time sky that is easily visible with the naked human eye (see www.darksky.org).

Inverse Square Law

A law that states that the illuminance (E) at a point on a plane perpendicular to the line joining the point and a source is inversely proportional to the square of the distance (d) between the source and the plane, $E = 1/d^2$. This means, for example, that if the distance between a light source and the object being lit is doubled or tripled, that the object being lit receives 1/4 or 1/9 illumination (respectively) as it did originally.

Inverter

An electrical device that changes direct current into alternating current. Inverters are an integral part of electronic transformers.

IP Ratings

Ingress Protection (IP) ratings, developed by the European Committee for Electro Technical Standardization, are used to specify the environmental protection an enclosure provides to the electrical equipment inside that enclosure. An IP rating normally has two numbers associated with it: (1) protection from solid objects or materials (like dust) and (2) protection from liquids (like water).

Example

With an IP rating of IP54, the "5" describes the level of protection from solid objects (protected against dust limited ingress with no harmful deposit) and the "4" describes the level of protection from liquids (protection against water sprayed from all directions with limited ingress permitted). An "X" can be used for one of the digits if there is only one class of protection, e.g., IPX1 describes only the level of protection from liquids (protection against vertically falling drops of water, e.g., condensation).

First IP Number - Protection Against Solid Objects

- 0 - No special protection
- 1 - Protected against solid objects up to 50 mm, e.g., accidental touch by person's hands.
- 2 - Protected against solid objects up to 12 mm, e.g., person's fingers.
- 3 - Protected against solid objects over 2.5 mm (tools and wires).
- 4 - Protected against solid objects over 1 mm (tools, wires, and small wires).
- 5 - Protected against dust limited ingress (no harmful deposit).
- 6 - Totally protected against dust.

Second IP Number - Protection Against Liquids

- 0 - No protection.
- 1 - Protected against vertically falling drops of water, e.g., condensation.
- 2 - Protected against direct sprays of water up to 15° from the vertical.
- 3 - Protected against direct sprays of water up to 60° from the vertical.
- 4 - Protected against water sprayed from all directions - limited ingress permitted.
- 5 - Protected against low pressure jets of water from all directions - limited ingress.
- 6 - Protected against temporary flooding of water, e.g., for use on ship decks - limited ingress permitted.
- 7 - Protected against the effect of immersion between 15 cm and 100 cm.
- 8 - Protected against long periods of immersion under pressure.

J

Junction Box

A plastic or metal container inside which all standard electrical wiring connections must be made. A junction box protects and conceals these electrical connections.

K

kw

See kilowatt

kWh

See kilowatt hour

Kelvin Temperature Scale

A temperature scale that references to absolute zero (0 degrees Kelvin), which, in theory, is the absence of all thermal energy. In lighting, the Kelvin temperature scale is useful when describing the color temperature of a light source.

Kilowatt (kw)

A measure of electrical power equal to 1000 watts.

Kilowatt Hour (kWh)

The standard measurement of electrical energy equal to one kilowatt of electricity used over the period of one hour.

Knockout

A perforated piece of metal (usually in the shape of a circle) on a metal box (like a junction box) that is removed with a punch and hammer to permit insertion of electrical wire like Romex wire.

Krypton

An inert gas in incandescent lamps that allows the filament to glow hotter and brighter and last longer.



L

lccf

See lamp current crest factor

LED

See light emitting diode

LEED

See Leadership in Energy and Environmental Design

LEP

See light emitting plasma

LLD

See lamp lumen depreciation

LM-79

A lighting measurement standard published by the IES in 2008 that provides specific practices for testing LED performance. LM-79 covers testing procedures for determining how the color and light emitted from LEDs is perceived by people and how power is measured for LEDs.

LM-80

A lighting measurement standard published by the IESNA in 2008 that provides specific practices for LED testing performance. LM-80 designates uniform test methods for measuring lumen maintenance for LEDs.

lx

See lux

Lamp

A light source such as an incandescent, halogen, xenon, fluorescent, or HID lamp. In everyday usage the terms, "light bulb" or "bulb", are usually used instead of the term, "lamp". In everyday usage the term, "lamp", usually refers to a portable lamp like a table lamp or a floor lamp but in the field of lighting the term, "lamp", refers to what most people call a "light bulb". Strictly speaking, the term, "bulb", refers to the glass envelope part of the "lamp".

Lamp Current Crest Factor (lccf)

The ratio of the peak or highest electric current to the average current for a ballast. A lamp current crest factor (lccf) above the maximum value set by a lamp manufacturer can shorten the lamp's life. The ANSI standard for lamp current crest factor is < 1.7

Lampholder

Synonymous with lamp socket

Lamp Lumen Depreciation (LLD)

As any lamp ages, it produces less and less light, the extent of which depends on the type of lamp in question. The value that indicates the lifetime decay of a lamp's lumen output as the lamp is operated over time is called lamp lumen depreciation. This is exactly why the published "initial lumens" for a lamp are always greater than the "mean lumens" for that same lamp. Some causes for lamp lumen depreciation may be the depletion of the incandescent filament over time, the accumulation of evaporated tungsten particles on the inside of the incandescent or fluorescent glass envelope, the photochemical degradation of the phosphor coating on the inside of a fluorescent glass tube, and the heat generated at the LED junction.

Layers of Light

Layers of light in a given space are created by introducing task lighting (lighting by which people perform tasks), accent lighting (lighting used to highlight specific objects such as works of art), decorative lighting (lighting created by very attractive light sources such as chandeliers or mini pendants), and general lighting (lighting that fills the space). This technique (long favored by cameramen and cinematographers) can eliminate ugly shadows in the room and on your face.

Leadership in Energy and Environmental Design (LEED)

An internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies aimed at improving performance across all the metrics that matter most: energy savings (including lighting energy efficiency), water efficiency, CO₂ emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. Developed by the U.S. Green Building Council (USGBC), LEED provides building owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions. LEED is flexible enough to apply to all building types - commercial as well as residential. It

works throughout the building lifecycle - design and construction, operations and maintenance, tenant fitout, and significant retrofit. (see www.usgbc.org/LEED)

Lens

In lighting (or optics), a lens is a transparent object that transmits and reshapes the direction of light. Made of clear glass or transparent plastic, a convex-type of lens can converge (focus) light while a concave-type of lens can diverge (spread) light. See spread lens, linear spread lens, and solite lens.

Lensed Troffer

A troffer or recessed light fixture that is covered by a lens. Many lensed troffers have been replaced in offices with parabolic troffers to reduce glare on computer screens.

Life-Cycle Cost

The total cost to purchase, install, maintain, and operate a lighting product over its lifespan. This cost, therefore, includes not just the initial cost of a light bulb, light fixture or retrofit but also the cost of maintaining it, which is often large given the cost of labor, and the cost of the electrical energy needed to operate it, which is often even larger than the maintenance costs. Comparing the life-cycle costs of an old lighting system and a proposed new lighting system is the only fair way to compare the costs of the two systems. To compare only the initial costs of the two light fixtures is not a valid way of comparing the total costs of the two systems.

Light Bulb

Generally speaking this term is synonymous with lamp.

Light Emitting Diode

A small electronic device that lights up when electricity is passed through it. LEDs are quite energy-efficient and have very long lives. They can be red, green, blue or white in color.

Light Emitting Plasma (LEP)

An emerging solid-state lighting technology that has applications in high illuminance fixtures such as street and parking lamps. LEPs use a solid-state device to generate radio waves that, in turn, power the plasma, which emits light. LEPs can have a rated life of 50,000 hours, are quickly dimmable, achieve full power in about 30 seconds, and have a CRI up to 94.

Light Fixture

A complete lighting unit consisting of a lamp (light bulb) or lamps, a housing, a connection to an external source of electrical power, and sometimes a transformer, ballast, or driver that modifies the incoming power to meet the unique electrical needs of the lamp(s) being used. Examples of light fixtures are wall sconces, recessed downlights, mini pendants, table lamps, floor lamps, track heads, step lights, picture lights desk lamps, and recessed troffers. Synonym: luminaire.

Lighting Facts Label

A label located on LED lighting products indicating the performance consumers can expect from a product. Manufacturers voluntarily submit products to the U.S. Department of Energy for testing of the lumens, lumens per watt (efficacy), watts, CRI, and color temperature of the LED product. The Department of Energy (DOE) started issuing the Lighting Facts Label to encourage consumer trust in LED products. LED flashlights, nightlights, and holiday lighting are not eligible for the Lighting Facts Label. (see www.lightingfacts.com)

Light Loss Factor

A factor used to estimate the illumination lost to a variety of factors such as dirt and dust accumulation, voltage fluctuations, and lamp depreciation to name a few.

Light Source

A source of light (visible portion of the electromagnetic spectrum). There are many natural light sources such as lightning bugs, stars including our own sun, lightning, aurorae, and many artificial light sources such as fluorescent lamps including CFLs, incandescent lamps (including halogen lamps and xenon lamps), high pressure sodium lamps, metal halide lamps, low pressure sodium lamps, neon lights, cold cathode fluorescent lamps, "light sticks", LEDs of various colors, organic light emitting diodes (OLEDs), light emitting plasma, candle light, gaslight, oil lamps, and kerosene lamps.

Light Trespass

outdoor light that is emitted into an unintended area; also sometimes known as spill light.

Linear Spread Lens

A lens designed to produce the asymmetrical distribution of light in one direction as opposed to a spread lens, which produces symmetrical distribution in all directions. This lens diverges light in one axis and leaves the other axis unchanged. A linear spread lens is sometimes called an elongated lens, elliptical lens, or a Skytex lens.

Line Voltage

In the USA and Canada the standard residential line voltage is 120 volts. (Before 1960 residential line voltage was 110 volts, a standard established by Thomas Edison.) Residential electric clothes dryers, however, operate on 240 volts. In the USA commercial line voltage may be 120 volts or 277 volts. In the USA both the residential and the commercial line voltage may vary by $\pm 10\%$. Thus, residential line voltage may be as low as 108 volts and as high as 132 volts. The standard line voltage is different in other countries. For example, in Japan it is 100V; in Mexico it is 127V; in China and Russia it is 220V; in France, Germany, Italy, England, New Zealand, and India it is 230V, and in Australia it is 240V.

Louver

A type of "screen" made of translucent or opaque material and geometrically designed to prevent lamps from being viewed directly within a given angle. Louvers are intended to minimize direct or indirect glare.

Low Bay Light Fixture

An indoor luminaire specifically designed for ceiling heights of less than 25ft. Also, see high bay light fixture.

Low Pressure Sodium Lamp

A light source that emits radiation from sodium vapor, resulting in yellowish light that causes the lamp to fall very low on the Color Rendering Index. Low pressure sodium lamps, however, have a very high efficacy and are primarily used for outdoor lighting such as street lighting and parking lot lighting.

Low Voltage

Although "low voltage" is generally defined as anything below 30 volts, low voltage lighting systems usually operate on 12 volts and sometimes 24 volts. It is important to note that a low voltage lighting system uses a transformer (electronic or magnetic) to transform the "incoming" voltage (usually 120 volts) to 12 or 24 volts because that is the voltage needed by the light bulbs in that lighting system. That is, the transformer of a low voltage lighting system uses the line voltage supplied in the home/building/facility but the light bulbs in that lighting system use the low voltage supplied by the transformer.

Lumen

An international unit (SI) of measurement used to describe the amount of light that a light source produces or emits.

As a reference, we have provided some lumen values for incandescent lamp wattages. These values are approximate because they can vary with the manufacturer of the lamp, the age of the lamp, the dirt on the lamp, whether the lamp is clear or frosted, the voltage rating of the lamp, and the exact voltage of the circuit.

- 4 watts - 20 lumens
- 7 watts - 45 lumens
- 10 watts - 56 lumens
- 15 watts - 95 lumens
- 25 watts - 232 lumens
- 40 watts - 360 lumens
- 60 watts - 615 lumens
- 75 watts - 960 lumens
- 100 watts - 1100 lumens
- 150 watts - 2850 lumens
- 200 watts - 3800 lumens
- 300 watts - 6280 lumens

Lumen Depreciation

The gradual decline in light output from a light source over time due to filament deterioration and the darkening of the glass envelope.

Lumen Maintenance

A measurement of how a lamp maintains its light output over time.

Luminaire

A light fixture. This should not be confused with the term, luminary, which is a small open paper bag, sometimes with a design on it, containing a lit votive candle set in sand. Luminaries are often used to line outdoor walkways to provide a festive mood to a setting and a certain level of safety. In Mexico and the southwest USA, the terms, luminary and luminaries, become luminaria and luminarias. The term, luminary, can also refer to a person who has attained eminence in his/her field or is an inspiration to others.

Luminaire Efficiency

The ratio of lumens emitted by a light fixture to the lumens emitted by the lamp(s) installed in that fixture. A luminaire with 0.8 efficiency is considered high whereas an efficiency of 0.6 is considered standard.

Luminous Flux

The overall light output (luminous radiant power) of a lamp or luminaire measured lumens.

Lux (lx)

The international unit for illumination measured in lumens per square meter. In the USA, illumination is measured in foot-candles instead. The relationship between the lux and the foot-candle is $1 \text{ fc} = 10.76 \text{ lux}$ or $1 \text{ lux} = 0.093 \text{ foot-candles}$.

M

MOL

See maximum overall length

Magnetic Ballast

A magnetic ballast uses magnetic inductance to regulate the voltage of a fluorescent lamp. Magnetic ballasts are noisier, heavier, and less efficient than electronic ballasts. Since magnetic ballasts do not alter the frequency of the electricity supplied to the lamp(s), a flicker or stroboscopic effect can be expected. Some people are more affected by this flickering of the light source and can develop headaches as a result.

Magnetic Transformer

A magnetic transformer includes an iron core wrapped with two sets of wires. The transformer "transforms" line voltage (usually 120 volts) into low voltage (usually 12 or 24 volts). One set of the wires connects to the line voltage side, which is called the primary side of the transformer while the second set of wires connects to the low voltage side, which is called the secondary side. Magnetic transformers are often larger, heavier, noisier, and less efficient than electronic transformers.

Maximum Overall Length (MOL)

Maximum overall length of a lamp – from tip to tip, from the top of the glass envelope to the bottom of the base.

Mean Lumens

The measured light output of a light source at 40% of lamp life; also sometimes called "design lumens".

Mercury

A chemical element found in nature that is added to the inside of fluorescent (including CFLs), metal halide, and high pressure sodium light bulbs during their manufacturing process. It is a silvery-looking liquid metal at room temperature that is a neurotoxin; that is, a toxic substance that can attack the nervous system and brains of humans.

Mercury Vapor Lamp

A high intensity discharge (HID) light bulb that produces light by radiation from mercury vapor, when supplied with electricity from a ballast. Mercury vapor light bulbs usually have very long lifetimes and are available with clear or phosphor-coated glass envelopes. The Energy Policy Act (EPA) of 2005 included a provision that no new ballasts for mercury vapor light bulbs may be imported or manufactured for "general illumination use" in the U.S., effective January 1, 2008.

Mesopic Vision

Occurs in intermediate lighting conditions and is effectively the combination of scotopic vision and photopic vision taking into account the total sensitivity of the rod cells in the human eye for the green-blue range with the color perception of the cone cells. This, however, gives inaccurate visual acuity and color discrimination.

Metal Halide Lamp

A high intensity discharge (HID) light bulb that produces light by radiation from certain metallic vapors (such as scandium, sodium, thallium, and indium), when supplied with electricity from a ballast. Known for producing accurate color rendition with a range of 65-90 and are, therefore, often used to light large gymnasiums and athletic stadiums; can be produced with almost any color temperature from 2700K to 20,000K; relatively unaffected by ambient temperatures and can, therefore, be used indoors and outdoors; has high efficacy of between 65-115 lumens/watt, which makes it approximately 5 times as efficient as a typical incandescent light bulb; has a long life of 15,000-20,000+ hours

Moonlighting

An outdoor lighting technique that simulates the filtering of natural light from the moon through an object such as a tree. A luminaire can be placed directly high on a tree to achieve this landscaping effect.

Motion Sensor

See occupancy sensor; synonymous with motion detector.

MR11 Lamp

A halogen multi-faceted reflector lamp that measures 1 1/8 inches in diameter and which directs a sharp, well-defined beam of light.

MR16 Lamp

A halogen multi-faceted reflector lamp that measures 1 3/8 inches in diameter and which directs a sharp, well-defined beam of light.

N

NAILD

See National Association of Independent Lighting Distributors

NEC

See National Electric Code

NEMA

See National Electrical Manufacturers Association

NIST

See National Institute of Standards and Technology

nm

See nanometer

Nanometer (nm)

A unit of linear measurement equal to 1 billionth of a meter (1/1,000,000,000 meter).

National Association of Independent Lighting Distributors (NAILD)

The National Association of Independent Lighting Distributors is a non-profit professional organization founded in 1977. The main objectives of NAILD are to "increase the effectiveness and profitability of the specialized lighting distributor through educational programs; to make available to members information pertaining to the distribution of lighting products; to develop marketing plans and programs through an exchange of ideas & to improve membership awareness of supplier marketing programs; and promote the need for and the benefit of good lighting." (see www.naild.org)

National Electric Code

A set of standards in the U.S. for electrical installation of wires and devices. The code is updated every three years and is published by the National Fire Protection Association.

National Electrical Manufacturers Association (NEMA)

Is a trade association founded in 1926. NEMA has about 450 electrical company members and serves as a "forum for the development of technical standards that are in the best interests of the industry and users, advocacy of industry policies on legislative and regulatory matters, and collection, analysis, and dissemination of industry data." (see www.nema.org)

National Institute of Standards and Technology (NIST)

Is a federal agency that works with industry and develops and applies technology, measurements, and standards. (see www.nist.gov)

Neodymium

A rare earth element discovered in 1885 with an atomic number of 60 in the Periodic Table of Elements. It is a fairly common silvery metal that is used to make slightly purple glass envelopes for incandescent light bulbs, eye protection goggles for welding and glass blowing, laser rods, filters to color correct light for art displays, and lenses used by astronomers to calibrate spectrometers, optical instruments used for analyzing light. Using this substance in an incandescent light bulb makes it less "yellowish" and more like natural outdoor light; however, the use of these "daylight" light bulbs can "expose" the flaws or inconsistencies in things.

Neon

A colorless, inert gas that glows a shade of red-orange in signs and lamps when current is applied. Neon (Ne) is found in the atmosphere and is considered rare on Earth compared to its presence in the universe.

Niche Lighting

Lighting that is specifically designed for a small architectural niche (a small area recessed into a wall that usually is topped with partial dome). Due to the small size of a niche, the lighting for a niche is generally very small and often hidden from view in the top dome and/or the sides of the niche.

Nominal Length

The nominal length of any object generally refers to its approximate length; the nominal length of an object should never be construed as its exact length. For example, a light bulb can be referred to as 1/2 inch long (the nominal length) but actually measure 0.53 in length.

O

OLED

An organic light emitting diode is a solid-state lighting technology similar to LEDs except that the electroluminescent layer is composed of organic material.

Occupancy Sensor

An electrical device that detects the presence of humans and turns a light fixture on. Occupancy sensors can use infrared, ultrasonic, and/or audio technology to detect the presence of people in an area.

Opaque

A term that describes a material that does not transmit any visible light. A wooden door, aluminum foil, and bricks are all examples of opaque materials.

Open Circuit

An electric circuit in which the flow of electricity is interrupted due to an open circuit breaker or a blown fuse or a burned out electrical component or an on/off switch that has been turned off.

Optics

A branch of physics that studies infrared, ultraviolet, and visible light and how they interact with matter. Optics also focuses on the construction of instruments/accessories/devices that detect and manipulate light, such as mirrors, lenses, filters, and louvers.

Outlet

A connection to power supply for an electric plug. Outlet design varies from country to country, but in the United States an outlet generally has 2 sockets that are designed for a plug with 2 or 3 prongs.

P

PIR

See passive infrared

Parabolic Troffer

A troffer or recessed light fixture that was made popular in offices due to its ability to reduce glare on curved surfaces like a computer screen compared to the lensed troffer. This troffer has a parabolic shape to the housing of each lamp. Parabolic troffers waste a high amount of energy due to a large percentage of light not leaving the troffer and are outdated with the advances in computer screen technologies such as LED and LCD.

Paracube

A louver, usually made of plastic, with a cell-like structure of open cubes designed to control glare in a troffer. Paracubes are often installed in offices to combat glare on computer screens.

Parallel Circuit

An electric circuit that has two or more paths for the electricity to flow. The light fixtures in a parallel electric circuit are connected in "parallel" to each other like rungs on a ladder. If one of the light fixtures in a parallel circuit burns out, the other light fixtures will remain on because the electric current would still be able to flow through them.

PAR Lamp

PAR is an acronym for a parabolic aluminized reflector. A PAR lamp, which may use an incandescent filament, a halogen filament tube, or an HID arc tube is a precision pressed-glass reflector lamp that reflects light coming from the filament much like a parabola. PAR lamps (such as PAR20, PAR30, and PAR38) rely on both the internal reflector and prisms in the lens for the control of the light beam.

Passive Infrared

A technique used by a motion sensor that detects the movement of heat sources.



Path Light

A luminaire that illuminates a walkway. Path lights can be solar powered or wired and be programmed to turn on and off at certain brightness levels throughout the day.

Pendant

Pendant lights can provide both task and general lighting. Equipped with shades or globes to avoid glare, they are suspended from the ceiling over dinette tables, game tables, kitchen counters, or other work areas. When used over end tables or night tables, they free up the space occupied by table lamps. In general, pendants should be hung about 30 inches above the tabletop and be about 12 inches narrower than the table on all sides. Not to be confused with a jewelry pendant, which is usually a small to medium-sized ornamental piece of jewelry attached to a necklace or bracelet.

Phosphor

The coating on the inside glass tubing of a fluorescent lamp that transforms some of the ultraviolet energy created inside the lamp into visible light.

Photocell

A device that detects levels of daylight and adjusts luminaires accordingly. It is often used with a street light to turn the light on at dusk and off at dawn.

Photopic Vision

human color vision under normal lighting conditions during the day produced by the cone cells in the human eye.

Picture Light

A luminaire designed to project light over a picture/painting/photograph. A picture light can be attached to the picture frame or the wall or be recessed in the ceiling.

Pigtail

A short piece of electrical wire (minimum of 6in long) used to connect two or more wires to an electrical device (e.g., light switch) - a short piece of wire joined by a wire nut with two or more wires in order to connect multiple wires to a control (such as a light switch or dimmer). The NEC mandates pigtails be a 6-inch wire or longer.

Pinspot

A very narrowly focused beam of light; may also refer to the light fixture that produces a very narrowly focused beam of light.

PL Lamp

A nickname for a twin tube compact fluorescent lamp coined by Philips Lighting, a large manufacturer of lamps.

Polarized Plug

An electrical plug with one of the two blades being wider than the other so that the plug can be inserted into an electrical outlet in only one orientation - a plug with 1 prong that is wider than the other and serves to "ground" the connection. Polarized plugs are designed to protect people from being shocked and prevent voltage from reaching an appliance switched "off".

Polycarbonate

A durable plastic material resistant to high temperatures and tampering. Polycarbonate is used in a variety of applications from bullet-proof glass to scratch-resistance eyewear. In lighting, the material is often used in fixture construction due to its excellent transmission of light and durability.

Portable Lamp

A table lamp, floor lamp, pharmacy lamp, or reading lamp that can be easily moved and plugged into an electrical outlet; officially called a portable luminaire.

Power Factor

A ratio that indicates if the voltage and current are out of phase in an electrical circuit. A power factor that is near 1.0 is considered good because this means that the electrical circuit is able to do work efficiently. The closer the power factor is to 0, the more inefficient the electrical circuit is. A high power factor (HPF) is generally considered to be 0.90 and above and a normal power factor (NPF) is generally considered to be between 0.5 and 0.6.

Preheat

The process of heating a filament prior to striking the arc in a fluorescent lamp. Also known as switch start fluorescent lamps, preheat fluorescent lamps require a starter unlike rapid start fluorescent lamps.

Prismatic Lens

See spread lens

Q

Quartz Halogen Lamp

Synonymous with halogen lamp

Quick Connector

An electrical connector made up of plastic on the outside and metal on the inside that allows electrical connections to be made by simply pushing short uninsulated wire sections into the holes of the quick connector. A quick connector is sometimes called a "push-in wire connector" or a "poke-in wire connector", which is different from a screw-on wire connector (sometimes called "wire nut").

R

RFI

See radio frequency interference

RLM

Originally this term stood for reflector light microscopy; however, today it means reflector luminaire manufacturer. It is a light fixture that is designed to project light downward, a characteristic that the International Dark Sky Association strongly approves of. These retro-style fixtures were originally commonly used in industrial areas; however, today the RLM-style light fixtures are used in non-industrial installations such as multi-family sites, restaurants, retail stores, and hotels in both indoor and outdoor applications.

Radio Frequency Interference (RFI)

Interference to the radio frequency band caused by other high frequency equipment or devices in the immediate area. Fluorescent lighting systems and AC electronic transformers can generate a certain amount of RFI.

Rapid Start

A fluorescent lighting system that does not require a starter and takes about 1 to 2 seconds to emit light. The ballast preheats the electrodes within the fluorescent lamp and initiates the arc without a starter or the application of high voltage to the electrodes of the lamp.

Rated Life

The rated life of a lamp signifies the time at which 50% of a large quantity of these lamps will have burned out. That means that 50% of these lamps will burn out before the rated life and 50% will burn out after the rated life. The rated life does not mean that every one of the lamps will last at least that long. Also, please note that the Actual Life of a Lamp = the Rated Life of that Lamp x (Rated Voltage/Operating Voltage) raised to the 12th power. For example, the Actual Life of a certain lamp that is designed to be used with 130 volts is equal to the Rated Life of that Lamp (let's say 1000 hours) x (130 volts/120 volts) raised to the 12th power. The Actual Life of this lamp is, therefore, equal to (1000 hours) x (1.083) raised to the twelfth power = (1000 hours) x (2.61) = 2610 hours. This means that an incandescent lamp that has a rated life of 1000 hours and is designed to be used with 130 volts but is used with 120 volts instead will have an "Actual Life" of 2610 hours.

Receptacle

The receiving end on an outlet that connects the power supply to a plug. A receptacle can have 2 to 4 holes, including a connection for grounding.

Recessed Downlight

A light fixture (usually circular but sometimes square) recessed into the ceiling that usually concentrates the light in a downward direction. Recessed downlights are usually composed of 3 key components: the housing, usually hidden above the ceiling, the trim, usually very visible, and the light source, which could be an incandescent, halogen, fluorescent, LED, or HID lamp. Synonyms: downlight, can, recessed can, high hat, pot light.

Reflectance

The ratio of light reflected by a surface to the amount of light originally striking that surface; reflectance = reflected light/incident light.

Reflection

The bouncing of light upon contact with a different medium or boundary (such as a mirror, clear glass, or calm water surface). Not to be confused with refraction, which is the bending of light as it passes through a different transparent or translucent medium.

Reflector

An opaque material that controls light into a certain direction. A component of PAR lamps, reflectors can be used to intensify light. A mirror is an example of a flat reflector.

Reflector Lamp (R Lamp)

An incandescent, cone-shaped, light bulb that has a reflecting surface on the inside rear of the glass envelope. Variations of this lamp type are the bulged reflector lamp (BR lamp), the ellipsoidal reflector lamp (ER lamp), and the small reflector lamp (R). Since mid-2008 BR and ER light bulbs greater than 65 watts, used mostly in commercial retail applications, have been outlawed from being manufactured. These banned light bulbs can be replaced with more-efficient halogen PAR light bulbs. Also since mid-2008, R20 light bulbs can be no more than 45 watts. If a higher wattage reflector-type lamp is needed, a more efficient halogen PAR20 light bulb can be used. The 65-watt BR30 light bulb, commonly used in homes and restaurants, may still be manufactured and sold.

Refraction

The bending of light due to a change in its speed due to light passing from one transparent medium into another transparent medium (e.g., from air to glass, from water to air, from air to vacuum, diamond to air).

Refractor

A transparent material, such as a lens or a prism, that bends or refracts light

Restrike Time

The time that it takes a HID lamp to come to full brilliance after it has been turned off.

Retrofit

Replacing old and/or inefficient lighting technology with new lamps, ballasts, luminaires, or equipment that improves the efficiency or safety of the lighting system.

R Lamp

See reflector lamp

ROMEX® Wire

ROMEX® is a trademark of the Southwire Company which refers to their specific brand of "non-metallic sheathed electrical cable". The term, "Romex", is often incorrectly used as a generic term to refer to any "non-metallic sheathed electrical cable" just like the brand name Kleenex is often incorrectly used to refer to any tissue. Non-metallic sheathed electrical cable is the type of wiring that is used throughout your home to connect virtually everything that is electrical. The wiring behind all of the walls and ceilings in your home connecting the electrical panel to switches, junction boxes, receptacles, exhaust fans, and light fixtures is non-metallic sheathed electrical cable. The non-metallic sheathing is the outside rubber insulation around the entire cable. The cable inside the sheathing is usually made up of 3 wires: one wire with white insulation (neutral wire), one wire with black insulation (power wire), and one copper wire with no insulation (ground wire). The size of the non-metallic sheathed electrical cable that is used to connect lighting fixtures in a home is usually described as "14/2 with ground" (although this may vary with geographical location). The "14/2" refers to the two insulated wires that are 14 gauge in size and the "ground" refers to the uninsulated copper wire. On our web site we often refer to this non-metallic sheathed electrical cable as "household wire".

Rope Light

Often describes a string of LEDs or miniature incandescent light bulbs (placed about 1.0in apart) connected in clear plastic tubing (about 0.5in in diameter) that can be plugged into an outlet

S

SAD

See seasonal affective disorder

SSL

See solid state lighting

Sconce

See wall sconce. Not to be confused with a scone, which is a flat, round cake of wheat flour.

Scotopic Vision

Human visual perception in low light conditions (night vision) produced exclusively by the rod cells in the human eye, which are most sensitive to wavelengths of light around 498 nm (green-blue).

Seasonal Affective Disorder (SAD)

A type of depression that occurs in certain individuals who experience a lack of sunlight - usually during the winter months.

Security Lighting

Lighting that is used to protect people and property from criminal activity. When properly employed, security lighting eliminates shadows near buildings and provides even landscape illumination for pedestrian safety.

Self-Luminous Exit Sign

An exit sign that relies on tritium gas, which is slightly radioactive, bombarding phosphor-coated glass to provide illumination. Self-luminous exit signs do not require any other power source and can last nearly 20 years before they need to be replaced.

Semi-Specular

A reflector that produces a diffuse or distorted image as opposed to a specular reflection like that seen in a mirror.

Series Circuit

An electric circuit that has only one path for the electricity to flow. The light fixtures in a series electric circuit are connected to each other in a single line like links in a chain. If one of the light fixtures in a series circuit burns out, the other light fixtures would not remain on because the electric circuit would become an open circuit and the electric current would not be able to get to the other light fixtures. Another term for a series circuit is a "daisy chain".

Shield

An opaque or semi-opaque element that serves to shield a light source from direct view at certain angles.

Shielding Angle

The angle between the horizontal plane through a fixture and the line of sight where the bare lamp of the fixture is first visible. The shielding angle and the cut-off angle are complementary angles, meaning they total 90 degrees. The greater the shielding angle, the more glare is reduced.

Silhouetting

A landscape lighting technique used to create a distinct outline or silhouette of plants or other objects.

Single-Pole Switch

A standard on/off wall switch that is the only switch that controls one or more light fixtures in a single electrical circuit.

Sky Glow

The "haze" or "glow" that surrounds highly populated areas and reduces the ability to view the nighttime sky, also known as "light pollution". Specifically, light that enters the sky from an outdoor lighting system by indirect light reflected from atmospheric particles such as fog, dust, or smog.

Skytex Lens

See linear spread lens

Snoot

A protruding hollow cone of opaque material that provides a high cut-off angle for certain types of track fixtures, landscape lights, or spotlights. A snoot focuses light into a small area and is often used in art gallery lighting, landscape lighting, or theater lighting.

Socket

(1) That portion of a luminaire that provides a means of physically holding the lamp base and connecting the lamp to the luminaire's electric circuit; (2) a power point usually mounted in a wall that serves as a connection for electrical plugs. Sockets have holes or slots for electrical plugs and are sometimes called "outlets".

Solid State Lighting (SSL)

Lighting produced by passing electricity through a semiconductor (like an LED, an OLED, or a PLED) rather than electrical filaments (like incandescent, halogen, or xenon) or plasma (like fluorescent, metal halide, or high pressure sodium).

Solite Lens

A glass lens with a subtle textured surface that "softens" the transmission of light but maintains high transmission values.

Spacing Criterion

The maximum distance allowed for light fixtures to be spaced apart and still provide complete illumination of the work plane.

Sparkle Lighting

Lighting that creates aesthetic points of "sparkle". This technique can be achieved with a chandelier or even fiber optic lighting and is useful in elegant locations.

Specular Reflection

Regular reflection, without diffusion (see diffuse), in accordance with the laws of geometrical optics, as with a mirror or a highly polished metallic surface.

Spill Light

Light that goes beyond the object being lit.

Splice

A connection of two or more pieces of electrical wire made by using a wire nut or a terminal block.

Spread Lens

A lens used in the front of a luminaire designed to diverge light evenly in all directions. Also called a prismatic lens, it is designed with perpendicular ribs on one side of the lens.

Starter

An electrical device used in conjunction with a ballast for the purpose of starting an electric discharge lamp like a fluorescent lamp or an HID lamp.

Step Light

A luminaire that is specifically designed to illuminate stairs.

Stroboscopic Effect

The periodic variation of light output caused by a fluorescent light source powered by a low frequency alternating current (AC). The moving images on televisions and other rapidly moving objects can appear to stand still or flicker. Often associated with fluorescent lighting, the stroboscopic effect can be substantially reduced with an electronic ballast.

Sulfur Lamp

A light source that relies on microwaves to excite sulfur gas, which heats up considerably and emits light. Sulfur lamps do not have electrodes but need efficient cooling to prevent melting. Sulfur lamps contain no mercury and can have a long lifespan of 60,000 hours.

T

Tandem Wiring

A type of electrical wiring that shares one ballast located inside a single fluorescent light fixture with one or more other fluorescent fixtures. This technique is used to reduce the cost of the lighting system, reduce the cost of maintaining the lighting system, and reduce the cost of the electrical energy needed to power the lighting system.

Task Lighting

Lighting that is specifically installed to light an area where a task is performed. Under cabinet lighting used in a kitchen is a good example of task lighting.

Terminal Block

A special electrical connector that uses insulating plastic on the outside and metal screws and clamps on the inside to create good splices for electrical wires, especially low voltage electrical wires. The screws inside the terminal block allow the installer to be certain that the electrical connections are very secure and tight, which, in turn, will minimize the possibility of arcing and overheating with low voltage connections.

Three-Way Lamp

An incandescent lamp that offers 3 levels of illumination (brightness) by using 2 different filaments with one filament providing the lowest level of illumination, the second filament providing a higher level of illumination, and the 2 filaments together providing the highest level of illumination. A few compact fluorescent lamp (CFL) models now also offer 3 levels of illumination but by using a different mechanism.

Three-Way Switch

A wall switch that allows two switches like this to control one lighting system. Whenever one of the three-way switches is flipped in a given circuit, the light changes its state; that is, if the light was on, it then turns off and if the light was off, it then turns on.

Torchiere

A tall floor lamp that provides indirect lighting with its light source located within a reflecting bowl that directs the light upward, which then reflects off the ceiling.

Toroidal Transformer

A type of magnetic transformer with a donut-shaped core. Toroidal transformers are generally more efficient, lighter weight, quieter, and cooler than conventional "EI magnetic transformers". Toroidal transformers can be loaded 100%, meaning a 600-watt transformer can power 600 watts of lighting. EI magnetic transformers, however, should be loaded approximately 80%, which means that a 600-watt EI magnetic transformer should be used to power about 480 watts.

Track Lighting

Lighting that uses several luminaires attached to a track mounted on a ceiling or wall to illuminate a space. The track provides the current for the various luminaires, which allows them to be manipulated into different positions.

Transformer

An electrical device that transforms the line voltage of a facility (usually 120 volts for residential settings and 277 volts for commercial settings) into the voltage that a low voltage lighting system requires (12 volts or 24 volts).

Translucent

A term that describes a material that transmits some visible light usually with some distortion. A frosted piece of glass, a stained glass window, and paper are all examples of translucent materials.

Transmit

(For a wave) to pass through a medium (such as light passing through glass) without a change in color (wavelength or frequency).

Transparent

A term that describes a clear material that transmits most, if not all, of the visible light incident upon it with very little, if any, distortion. A typical glass window pane, the air, and clear plexiglas are all examples of transparent materials.

Troffer

A large recessed ceiling luminaire (light fixture) that often uses 1-4 fluorescent lamps (light bulbs), usually measures 24in by 48in or 24in by 24in, and is usually installed with the opening flush with the ceiling. There are several types of troffers, for example: lensed troffer, parabolic troffer, basket troffer, and volumetric troffer.

Tube

The outer glass envelope of some light sources. See lamp and bulb for more information.

Tungsten

A chemical element found in nature as a steel-gray metal that has the highest melting point of all the non-alloyed metals is, therefore, often used to make the filament in incandescent light bulbs.

Tungsten Halogen Lamp

Another term for halogen lamp

Twin Tube

A type of compact fluorescent lamp (CFL) made up of two parallel glass bulbs or tubes. Also referred to as a "PL" lamp (by Philips Lighting) or a "biax" lamp (by GE) or a "dulux" lamp (by Osram-Sylvania).

U

UL

See Underwriters Laboratory

UV

See ultraviolet radiation

U-Bend Lamp

A type of fluorescent lamp that is shaped like the letter "U"; sometimes called a U-shape fluorescent lamp.

UL Listed

When a lighting product (light fixture or light bulb) is UL listed that means the Underwriters Laboratories (UL) has tested that specific lighting product and has certified that it meets all of its safety standards and is, therefore, safe to use. The UL symbol with the letter "C" and the letters "US" indicate that the lighting product is UL listed in both Canada and the United States. If the UL symbol only has the letter "C", then the product is UL listed only in Canada. If the UL symbol has no letters next to it, then the product is UL listed only in the United States. The UL listed symbol appears on complete components and end products suitable for factory and field installation.

UL Recognized

when an electrical component is UL recognized that means the Underwriters Laboratories (UL) has tested that specific electrical component and has certified that it meets all of its safety standards and is, therefore, safe to use as a component within a light fixture. The backward RU symbol with the letter "C" and the letters "US" indicate that the lighting component is UL registered in both Canada and the United States. If the backward RU symbol only has the letter "C", then the product is UL recognized only in Canada. If the backward RU symbol has no letters next to it, then the product is UL recognized only in the United States. The UL recognized symbol is used on components that are intended to be installed in another device, system, or end product.

Underwriters Laboratories (UL)

An independent organization that certifies product safety, including electronic devices. When a product passes UL safety, it may be marked with a UL label. The

organization began in 1984 and now evaluates nearly 20,000 types of products annually. Inc., like Electrical Testing Laboratory (ETL), is an independent, not-for-profit product safety testing and certification organization. The UL symbol with the letter, "C", and the letters, "US", indicate that the lighting product is UL listed in both Canada and the United States. (see www.ul.com)

Uniformity

The degree of variation of illuminance over a given plane. Greater uniformity means less variation of illuminance.

Uplight

for a suspended light fixture (such as a single pendant light, an entire row of linear luminaires, or a semi-flush mount ceiling fixture) the amount of light lumens directed upward at or above 90 degrees. Also, refers to a single light fixture that is generally placed on the floor or recessed in the floor that projects light upward.

Uplighting

A lighting technique that directs light on an object from a light fixture aimed upward. Uplighting can create an intimate environment such as using a candle in a restaurant, or it can create harsh shadows resulting in an eerie effect like that created by uplighting a statue. This technique is also used in landscape lighting to accent trees or bushes.

Ultraviolet Radiation (UV)

A form of electromagnetic radiation that is not visible to the naked human eye and which has a wavelength of less than 400 nanometers (nm) and greater than 100 nm.

V

VCP

See visual comfort probability

VHO

See very high output

Valance Lighting

Lighting at or near the top of a window provided by a luminaire that is shielded by an opaque panel parallel to the wall which directs light upward and downward from the luminaire.

Vandal Resistant

A special type of light fixture designed to be break-resistant and tamper-resistant. Vandal resistant light fixtures are often made of heavy gauge metal, a strong polycarbonate plastic diffuser, and tamper-proof fasteners that are difficult to unfasten without a special tool. Such light fixtures are often used in public spaces like subway stations, college dormitories, bus terminals, and jails.

Vanity Light

A luminaire that is positioned above or on either side of a bathroom mirror.

Vapor-Tight Luminaire

A totally enclosed light fixture constructed with a special rubber gasket so that a specified vapor (usually water vapor) or gases cannot enter its enclosure.

Very High Output (VHO)

A fluorescent lamp designed to use even more current than a high-output fluorescent lamp, which allows for an even greater lumen output.

Visual Comfort Probability (VCP)

The VCP for a lighting system is the percent of observers expected to find the glare acceptable in a specific location from a specific direction. The higher the VCP, the more comfortable observers find the space.

Volt

The standard unit of electrical force or pressure between two points in an electric circuit. The greater the voltage, the faster electrons will travel through a circuit, meaning the greater the current running through a circuit. The standard household line voltage in the U.S. is approximately 120 volts. The unit is named after Alessandro Volta, an Italian physicist who made the first electric cell. See voltage.

Voltage

The difference in electrical charge between two points in a circuit expressed in volts; the electric pressure that exists between two points and is capable of producing a flow of current when a closed circuit is connected between the two points; the rate at which energy is drawn from a source that produces a flow of electricity in a circuit; synonyms: electrical potential, electromotive force, EMF; Formulae: volts = amps x ohms, $V = I \times R$, voltage = electrical current x electrical resistance.

Voltage Drop

The loss of voltage caused by the electrical resistance of the wire and the light fixtures in the circuit. It can become especially noticeable in low voltage circuits (where the operating voltage is 12 or 24 volts). Voltage drop may be minimized by using a thicker wire with a lower gauge, shortening the distance between the low voltage transformer and the light fixtures, and/or using a DC transformer.

Volumetric Troffer

A premium troffer that is designed to eliminate the cave effect associated with parabolic troffers. The volumetric troffer distributes light more evenly than its predecessors and its light sources are concealed by diffuse translucent shielding.

W

Wall Grazing

A lighting term that refers to the dramatic highlight and shadow effects on uneven surfaces such as draperies, stone, and brick. Grazing creates easily distinguishable high and low levels of light on the irregular surface.

Wall Sconce

A luminaire (light fixture) affixed to the wall and usually decorative in nature.

Wall Washing

A lighting technique that produces a relatively smooth, even level of illumination on a wall that minimizes the apparent texture of the surface.

Watt

A standard unit of power (the rate at which work is performed). The power created by 1 ampere passing across a potential difference of 1 volt is equal to 1 watt ($W=AV$). One watt also equal 1 joule per second ($W=J/s$). The unit is named after James Watt because of his work on steam engine technology. In lighting, watts indicate the amount of power a light bulb consumes not the light output of that light bulb.

Wattage

The amount of electrical power consumed by a lamp or light fixture measured in "watts". One watt is equal to the power dissipated by 1 ampere of electrical current flowing across a resistance of 1 ohm or the power produced by 1 ampere of electrical current under an electromotive force of 1 volt. One horsepower is equal to 746 watts. Formulae: watts = volts x amps, $P = V \times I$, electrical power = electromotive force x electric current. Note: the wattage rating of light bulb does not indicate how much light is produced by that light bulb.

Wavelength

Light often behaves as though it were made up of waves and the shortest distance between two similar points of a given wave is called the wavelength of that wave. The wavelength of red, which resides at one end of the visible spectrum, is about 700 nanometers while the wavelength of violet, at the other end of the visible spectrum, is about 400 nanometers. - a measure of the distance between the corresponding points in consecutive cycles of a wave (such as consecutive troughs

or crests). Wavelengths of the electromagnetic spectrum are generally measured in nanometers.

Wire Nut

A registered trademark of Ideal Industries that is sometimes used to identify a twist-on wire connector that is used to secure the ends of 2 or more electrical wires in order to make an electrical connection. Wire nuts are thimble-shaped, made of plastic or plastic and metal, and color-coded for wire capacity. Wire nuts are an acceptable and easy-to-use alternative to soldering wires together.

Work Plane

The horizontal plane (a flat surface) on which a visual task (such as reading or writing) is performed. Illumination is designed for this plane, which is normally the height of a standard table (approximately 30 inches from the floor).

X

Xenon Lamp

A type of incandescent light bulb that contains xenon gas in the glass envelope. The primary reason that this is done is to lengthen the average rated life of the lamp. Depending on the lamp a typical xenon lamp may have a rated life of 10,000 hours whereas a similar halogen lamp may have a rated life of 2,000 hours. Unlike halogen lamps, xenon lamps may be touched with bare hands without affecting the rated life of the lamp. Xenon lamps also operate at cooler temperatures than comparable halogen lamps. Like halogen lamps, xenon lamps may be dimmed (using the right dimmer) whether the lamp is rated for low voltage (12 volts or 24 volts) or line voltage (120 volts).

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