

Glossary

A

absorption A general term for the process by which incident flux is converted to another form of energy, usually heat.

AC *alternating current*

accent lighting Directional lighting used to emphasize or draw attention to an object or area.

ambient lighting Lighting throughout an area that produces general illumination.

B

ballast An electrical device designed to control the current delivered to a fluorescent or HID lamp. Most ballasts also convert the line voltage into the proper voltage and waveform needed to start and operate the lamp.

ballast efficacy factor (BEF) The ratio of the ballast factor, specified as a percentage, to the ballast input power in watts. Ballast efficacy factor is only meaningful when used to compare ballasts operating the same type and number of lamps. Also called the ballast efficiency factor.

ballast factor (BF) The luminous flux of a fluorescent or HID lamp (or lamps) operated on a ballast divided by the luminous flux of the same lamp when operated on the standard (reference) ballast specified for rating lamp lumens.

base The end of a lamp containing electrical contacts.

BEF *ballast efficacy factor* or *ballast efficiency factor*

BF *ballast factor*

bilevel switching Refers to light-switching capabilities that enable two or more different light levels in a given area. For example, in a system with three-lamp fluorescent fixtures, one switch may operate the center lamp in each fixture, while another operates the outer lamps. This arrangement makes three lighting levels possible (one, two, or all three lamps lit), yet the term “bilevel” is still used to describe it.

blackbody A thermal radiator of uniform temperature whose radiant exitance in all parts of the spectrum is the maximum obtainable from any thermal radiator at the same temperature. Such a radiator is called a blackbody because it will absorb all the radiant energy that falls upon it. All other thermal radiators are called nonblackbodies; they radiate less energy in some or all wavelength intervals than a blackbody of the same size and the same temperature.

bulb The glass envelope of a lamp.

C

CCT *correlated color temperature*

cd *candela*

CFL *compact fluorescent lamp*

CIE *Commission Internationale de l'Eclairage*

clerestory That part of a building rising clear of the roofs or other parts and whose walls contain windows for lighting the interior.

coefficient of utilization (CU) The ratio of the luminous flux (lumens) from a luminaire calculated as received on the work plane to the luminous flux emitted by the luminaire's lamps alone. CU is equal to the product of luminaire efficiency and room utilization factor.

color rendering A general expression for the effect of a light source on the color appearance of objects in comparison with their color appearance under a reference light source.

color rendering index (CRI) A measure of the degree of color shift objects undergo when illuminated by the light source as compared with those same objects when illuminated by a reference source of comparable color temperature.

color temperature The absolute temperature of a blackbody radiator having the same apparent color as the light source.

cool white (CW) The designation for a phosphor with a CCT of approximately 4,100 kelvin and a CRI of about 60.

correlated color temperature (CCT) Refers to the temperature of a blackbody radiator emitting light of comparable color to the light source in question. Measured in degrees kelvin.

CRI *color rendering index*

CU *coefficient of utilization*

CW *cool white*

D

DALI *digitally addressable lighting interface*

DC *direct current*

demand charges Fees levied by a utility company for electric demand.

demand, electric Electrical power delivered to a system at a given time or averaged over a designated period. Expressed in kilowatts.

diffuser A device that redirects or scatters light, primarily by diffuse transmission.

digitally addressable lighting interface (DALI) A protocol that enables a computer to communicate with individual lighting fixtures that are equipped with DALI-compatible ballasts.

dimmer A device used to control the intensity of a lamp's emitted light by controlling the voltage or current available to power the lamp.

downlight A small direct-lighting unit that directs the light downward and can be recessed, surface-mounted, or suspended.

E

efficacy The total luminous flux emitted by a lamp divided by the total lamp power input, expressed in lumens per watt.

eggcrate A type of louver having square cells oriented to allow light to pass through. Cell walls may be opaque or translucent, and cell walls are typically parallel or perpendicular to each other and not curved.

electrodeless lamp Also called induction lamps, these use a varying magnetic field rather than a voltage across two electrodes to produce the electric field that ionizes the gases in an HID lamp.

electrodes Electrically conductive elements inside a lamp that are used to provide the electric field that starts and operates the lamp.

electronic ballast Device using solid-state components to provide power to a discharge lamp at high frequency (typically 25,000 to 100,000 cycles per second, but sometimes as high as 2,500,000 cycles per second). Operation of fluorescent lamps at frequencies higher than 10,000 cycles per second produces more light using fewer watts than operation at power-line frequencies.

EMS *energy management system*

F

fc *foot-candle*

flood Type of lamp where beam angle is usually 30 percent or more.

fluorescent lamp A low-pressure mercury electric-discharge lamp in which a fluorescent coating (phosphor) transforms some of the ultraviolet energy generated by the discharge into light.

foot-candle (fc) A unit of illuminance, equal to 1 lumen per square foot or 10.76 lux.

G

glare The sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance and visibility.

H

HID *high-intensity discharge*

high-bay lighting Interior lighting where the roof truss or ceiling height is greater than approximately 7.6 meters (25 feet) above the floor.

high-intensity discharge (HID) A type of electric-discharge lamp in which the light-producing arc is stabilized by wall temperature and the arc tube has a bulb wall loading in excess of 3 watts per square centimeter. HID lamps include groups of lamps known as high-pressure mercury, metal halide, and high-pressure sodium.

high-pressure sodium (HPS) A high-intensity discharge lamp in which light is produced by radiation from sodium vapor operating at a partial pressure of about 1.33×10^4 pascals (100 torr). Includes clear and diffuse-coated lamps.

high output Ballasts and fluorescent lamps designed to operate at higher power than standard products of the same size in order to provide greater light output.

HO *high output*

HPS *high-pressure sodium*

I

IESNA *Illuminating Engineering Society of North America*

illuminance The amount of light shining on a surface.

incandescence The self-emission of radiant energy in the visible spectrum due to the thermal excitation of atoms or molecules.

indirect lighting Lighting by luminaires distributing 90 to 100 percent of the emitted light upward.

induction lamp Also called electrodeless lamps, these use a varying magnetic field rather than a voltage across two electrodes to produce the electric field that ionizes the gases in an HID lamp.

instant start (IS) A lamp and ballast system designed to start a lamp without preheating the electrodes by providing a high open-circuit voltage. An instant-start fluorescent lamp is also known in some countries as a cold-start lamp.

International System of Units A measurement system commonly referred to as the metric system.

IS *instant start*

K

K *kelvin*

kelvin (K) A unit measuring temperature on the Kelvin scale. Each degree is equal to a Celsius degree, but zero on the Kelvin scale is absolute zero or -273.15° Celsius.

kW *kilowatt*

kWh *kilowatt-hour*

L

lamp A device designed to convert electricity into light.

lamp lumen depreciation (LLD) The fractional loss of lamp lumens at rated operating conditions that progressively occurs during lamp operation.

lamp socket In fluorescent lamps, the tombstone-shaped component into which lamp contacts are inserted to make electrical contact with the ballast. In screw-base incandescent, compact fluorescent, or HID lamps, the component that receives the screw base and provides electrical connection to the power line or ballast.

LDD *luminaire dirt depreciation*

LED *light-emitting diode*

lens A glass or plastic element designed to change the direction of, and control the distribution of, light rays.

light Radiant energy that is capable of exciting the retina and producing a visual sensation. The visible portion of the electromagnetic spectrum extends from about 380 to 770 nanometers.

light-emitting diode A solid-state device that generates light by the recombination of electrons and holes in the junction between two different semiconductor materials.

light shelf A horizontal shelf positioned to direct daylight onto the ceiling and to shield occupants from direct glare from the sky.

LLD *lamp lumen depreciation*

lm *lumen*

louver A series of baffles used to shield a light source from direct view, absorb unwanted light, or redirect light by reflection.

low-pressure sodium (LPS) A discharge lamp in which light is produced by radiation from sodium vapor operating at a partial pressure of 0.1 to 1.5 pascals (approximately 10^{-3} to 10^{-2} torr).

LPS *low-pressure sodium*

lumen (lm) The SI unit of luminous flux. Radiometrically, it is determined from the radiant power. Photometrically, it is the luminous flux emitted within a unit solid angle (1 steradian) by a point source having a uniform luminous intensity of 1 candela.

luminaire Generic term for a complete lighting unit consisting of one or more lamps with parts designed to distribute light from the lamps, ballasts to provide power to the lamps, and components to connect the lamps or ballasts to a power source.

luminaire dirt depreciation (LDD) The fractional loss of task illuminance due to the accumulation of dirt on a luminaire.

luminaire efficiency The ratio of luminous flux (lumens) emitted by a luminaire to that emitted by the lamps used therein.

luminance The amount of light reflected back from a surface.

luminance contrast The relationship between the luminances of an object and its immediate background.

lux (lx) The SI unit of illuminance. One lux is 1 lumen per square meter.

lx *lux*

M

magnetic ballast Power circuit consisting of one or more magnetic coils and optional capacitors, designed to limit current and provide necessary starting voltage for discharge lamps.

metal halide (MH) A high-intensity discharge lamp in which the major portion of the light is produced by radiation of metals that are the product of dissociation of metal halides in the arc discharge. Includes clear and phosphor-coated lamps.

MH *metal halide*

P

PAR *parabolic aluminum reflector* or *parabolic aluminized reflector*

parabolic cube (paracube) A series of baffles arranged like an eggcrate but whose cross sections consist of segments of parabolas. Paracubes are designed to shield a light source while directing light through a narrowed angle, usually by specular reflection.

parabolic louver (paralouver) A series of parallel baffles whose cross sections consist of segments of parabolas. Paralouvers are designed to shield a light source while directing light through a narrowed angle, usually by specular reflection.

paracube *parabolic cube*

paralouver *parabolic louver*

PCB *polychlorinated biphenyl*

phosphors Substances that transform ultraviolet light generated by an electric arc into visible light. Phosphors can also be excited by electron impact, as in the cathode ray tubes used in televisions and computer monitors.

photopic vision Vision mediated essentially or exclusively by the cones of the eye. It is generally associated with adaptation to a luminance of at least 3.4 candelas per square meter. See also *scotopic vision*.

polychlorinated biphenyl (PCB) A solvent used as dielectric fluid in wet capacitors in ballasts manufactured before 1980. Ballasts using PCBs cannot be discarded in sanitary landfills.

prismatic Adjective describing the shape of elements in a lens designed to redirect light over wider angles in all directions.

R

rapid start A ballast and lamp system designed to start and operate a fluorescent lamp by simultaneous application of a low voltage to the lamp electrodes and a moderate voltage, higher than the lamp operating voltage, between one end of the lamp and the other. When the electrodes reach thermionic emission temperature, typically in about 1 second, the lamp starts without using high voltage.

RCRA *Resource Conservation and Recovery Act*

recessed can A cylindrical fixture recessed into a ceiling (also called *high hat*).

reference ballast A ballast specially constructed to have certain prescribed characteristics. Used in measuring the performance of electric-discharge lamps under standard conditions in order to establish their rated performance.

reflector A device used to direct light from a source through reflection, either specular or diffuse.

reflector lamp An incandescent filament or electric-discharge lamp that uses a reflective surface to direct the light (such as reflector-, ellipsoidal-reflector-, or parabolic-type lamps). The light-transmitting region may be open, clear, frosted, patterned, or phosphor-coated.

Resource Conservation and Recovery Act (RCRA) A U.S. Environmental Protection Agency regulation covering hazardous materials.

rods. Retinal receptors that respond at low levels of luminance, even below the threshold for cones. At these levels there is no basis for perceiving differences in hue and saturation. There are no rods near the center of the fovea.

room utilization factor The ratio of the light received on the work plane to that emitted by the fixture.

S

sconce Wall-mounted fixture providing indirect light from a wall and ceiling as well as direct light through a lens.

scotopic vision Vision mediated essentially or exclusively by the rods. It is generally associated with adaptation to a luminance below about 0.034 candelas per square meter. See also *photopic vision*.

SI *International System of Units*, abbreviated from the French name: *Système International d'Unités*.

specular reflector Reflector that directs light out at the same angle and in the same plane as it arrived at the reflector.

T

T# A designation of lamp type, as in T8, T12, and so on. T stands for tubular; the number describes lamp diameter in one-eighth-inch increments. A T8 lamp is eight-eighths of an inch (or 1 inch) in diameter; a T12 is twelve-eighths of an inch (or 1 and one-half inches) in diameter.

table lamp A portable luminaire with a short stand, suitable for standing on furniture.

task-ambient lighting Task lighting and ambient lighting combined in an area in such a way that the general level of ambient lighting is lower than and complementary to the task lighting.

task light Typically a fixture, either mounted on office furniture or having its own base and electric cord, with limited beam spread, designed to illuminate a small area.

torchiera A portable light fixture, typically standing on the floor, that provides indirect lighting or a combination of direct and indirect lighting.

troffer A recessed lighting unit having its opening flush with the ceiling in which it is installed. This term is derived from “trough” and “coffer.”

tungsten halogen A type of incandescent lamp using a tungsten filament and a high-pressure halogen gas cycle to reduce tungsten evaporation and clean vaporized tungsten from the walls of the lamp.

V

veiling reflection Regular reflections that are superimposed upon diffuse reflections from an object and that partially or totally obscure the details to be seen by reducing the contrast. This sometimes is called reflected glare.

very high output (VHO) Ballasts and T12 fluorescent lamps designed to operate using 1,500-milliamp current in order to provide greater light output.

VHO *very high output*

W

W *watt*

wall washer Any fixture installed close to a wall and designed to project most of its light onto that wall.

warm white (WW) The designation for a phosphor with a CCT of approximately 3,000 kelvin and a CRI of about 52.

WW *warm white*