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**AC (Alternating Current)**

Current which flows in one direction and then the other, alternately.

**Accent Lighting**

Directional lighting to emphasize a particular object or draw attention to a display item.

**Adaptation**

The process by which the human eye adjusts to a change in light level.

**Additional Information**

Typical application and/or other important information including footnotes, operating information, features and benefits.

**Ambient Lighting**

The general lighting present in an area --excluding task lighting and accent lighting but including general lighting and daylight streaming in.

**Amperes**

("Amps.") A measure of electrical current. In incandescent lamps, the current is related to voltage and power as follows: Watts (power) = Volts x Amps (current).

**ANSI (American National Standards Institute)**

A consensus-based organization which coordinates voluntary standards for the physical, electrical and performance characteristics of lamps, ballasts, luminaires and other lighting and electrical equipment.

**ANSI Ballast Type**

Ballast type used to operate lamp in accordance with ANSI standard.

**ANSI Codes**

These are 3-letter codes assigned by the American National Standards Institute. They provide a system of assuring mechanical and electrical interchangeability among similarly coded lamps from various manufacturers. General Electric uses the assigned ANSI Codes as Lamp Ordering Codes for most Projection Lamps.

**Application**

Also called "lighting application," it refers to the particular use the lamp is being put to. (e.g. high-bay industrial application or retail lighting application.) The term can also refer in a general way to "application engineering" which deals with specific parameters and usage of light sources. (e.g. how to do a lighting layout, where to place fixtures and so on.)

**Arc**

Intense luminous discharge formed by the passage of electric current in a gaseous medium across a space between electrodes.

**Arc Lamp**

A light source containing an arc (see above). Also called a discharge lamp, or an arc discharge lamp

**Arc Length**

In High Intensity Discharge lamps this is the distance between the electrode tips, which represents the physical length of the electrical discharge.

**Atmosphere**

This field designates the type of gas or vacuum filling a volume or chamber of the lamp. This chamber might contain a filament or it might refer to the bulb which contains the arc tube.

**Auto Rest Shutdown Circuit**

Circuit senses lamp end life and will automatically shut off power to the lamp(s). When a new lamp is inserted in the socket, the ballast resets, and turns on the lamp automatically.

Some shutdown circuits require the power to be interrupted before a new lamp will re-light.

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**Ballast**

An auxiliary piece of equipment required to start and to properly control the flow of current to gas discharge light sources such as fluorescent and high intensity discharge (HID) lamps. Typically, magnetic ballasts (also called electromagnetic ballasts) contain copper windings on an iron core while electronic ballasts are smaller and more efficient and contain electronic components.

**Ballast Efficacy Factor (BEF)**

Defined as ballast factor divided by input watts. The value is used to evaluate various lighting systems based on light output and power input. The BEF can only be used to compare systems operating the same type and quantity of lamps.

**Ballast Factor (BF)**

This is the percentage of a lamp's rated lumen output that can be expected when operated on a specific, commercially available ballast. Note that the "rated output" is sometimes measured on a reference ballast unlike ones that actually operate the lamp in the field.

For example, a ballast with a ballast factor of 0.93 will result in the lamp's emitting 93% of its rated lumen output. A ballast with a lower BF results in less light output and also generally consumes less power.

### **Ballast Hum**

Sound generated by the vibration of laminations in the iron core of the transformer or inductor present in the ballast.

### **Ballast Losses**

Power or energy dissipated in the ballast as heat and not converted to lamp energy.

### **Base or Socket**

The socket is the receptacle connected to the electrical supply; the base is the end of the lamp that fits into the socket. There are many types of bases used in lamps, screw bases being the most common for incandescent and HID lamps, while bipin bases are common for linear fluorescent lamps. Sample Base Types

### **Base Temperature (Maximum)**

The maximum operating temperature permitted for the base in Celsius. Fixture manufacturers need to ensure that these conditions are satisfied in their fixture.

### **Bayonet**

A style of bulb base which uses keyways instead of threads to connect the bulb to the fixture base. The bulb is locked in place by pushing it down and turning it clockwise.

### **Beam Angle**

The angular dimension of the cone of light from reflectorized lamps (such as R and PAR types) encompassing the central part of the beam out to the angle where the intensity is 50% of maximum. The beam angle sometimes called "beam spread" is often part of the ordering code for the reflectorized lamps. Example: The 50PAR30/HIR/NFL25 is a 50 watt PAR30 narrow flood lamp with a beam angle of 25 degrees (See FIELD ANGLE).

### **Beam Lumens**

The total lumens present within the portion of the beam contained in the beam angle.

### **Beam Spread (Approximate)**

For reflector type lamps. The total angle of the directed beam (in degrees horizontal or vertical) to where the intensity of the beam falls to 50% or 10% of the maximum candlepower value as indicated.

### **Biax®**

GE trademark for its biaxial family of high-efficiency and long-life compact fluorescent lamps. A straight tube is bent back in the middle, constituting a biaxial tube.

**Bi-Pin**

Any base with two metal pins for electrical contact. This is the typical base for a fluorescent tube of 1 to 4 feet in length. It consists of 2 prong contacts which connect into the fixture. Medium bi-pins are used with type T-8 and T-12 tubular fluorescent lamps, and miniature bi-pins are used for tubular T-5 fluorescent lamps.

**Blackbody**

A hot body with an incandescent black surface at a certain temperature used as a standard for comparison. Note that a black surface is the best radiator possible. A tungsten filament will emit slightly less radiation than a blackbody at the same temperature.

**Black Light**

A popular term referring to a light source emitting mostly near UV (320 to 400 nm) and very little visible light.

**Blacktop**

Whether or not the top of the miniature lamp has a blacktop coating. The coating is used to control unwanted brightness or glare.

**Bollard**

A short, thick post with a light at its top, used for grounds and outdoor walkway lighting.

**Bottom Exit (BE)**

(LFL plug-in ballasts) A configuration with leads or a wire-trap on the bottom or base of the ballast. This type of configuration is usually used when the ballast is mounted onto a junction box plate.

**Bottom Exit Studs (BES)**

(LFL plug-in ballasts) A configuration with screw studs mounted on the base plate or bottom of the ballast. The screws are 3/8" inches long with a #8-32 thread size (#8-32 nut). They are mounted on a two inch center. The studs are usually used to mount the ballast directly onto a junction box plate.

**Bulb**

A loose way of referring to a lamp. "Bulb" refers to the outer glass bulb containing the light source.

**Bulb Material or Coating**

The type of glass (or quartz) used in the glass envelope surrounding the light source. The material can also have coatings applied to achieve particular performances.

**Bulb Size**

Bulb shape followed by its size (the maximum diameter of the bulb expressed in eighths of an inch). For Compact Fluorescent products, "S", "D", "T", and "Q" are used to represent Single,

Double, Triple and Quad Biax® sizes. The code also includes a reference such as T4 to represent the size of the tube. Rectangular headlamps are designated as "Rect" and the number of millimeters horizontally.

### **Brightness**

Brightness can refer to any of several technical terms used in lighting and is, therefore, ambiguous (See LUMINANCE).

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### **Canadian Energy Standards**

Indicates ballast complies with Canadian Energy Standards and meets the requirements of CAN/CSA C654-M91.

### **Canadian Standards Association (CSA)**

An organization that writes standards and tests lighting equipment for performance as well as electrical and fire safety. Canadian provincial laws generally require that all products sold for consumer use in Canada must have CSA or equivalent approval.

### **Candela (cd)**

The measure of luminous intensity of a source in a given direction. The term has been retained from the early days of lighting when a standard candle of a fixed size and composition was defined as producing one candela in every direction. A plot of intensity versus direction is called a candela distribution curve and is often provided for reflectorized lamps and for luminaires with a lamp operating in them.

### **Candlepower**

An obsolete term for luminous intensity; current practice is to refer to this simply as candelas.

### **Candlepower (Mean Spherical)**

Initial mean spherical candlepower at the design voltage. Mean spherical candlepower is the generally accepted method of rating the total light output of miniature lamps. To convert this rating to lumens, multiply it by 12.57 (4 pi).

### **Candlepower Distribution Curve**

A graphical presentation of the distribution of light intensity of a light source, usually a reflector lamp or luminaire.

### **Compact Fluorescent Lamp (CFL)**

The general term applied to fluorescent lamps that are single-ended and that have smaller diameter tubes that are bent to form a compact shape. Some CFLs have integral ballasts and

medium or candelabra screw bases for easy replacement of incandescent lamps (See INTEGRAL, SELF-BALLASTED LAMPS).

### **Capacitor**

Device in ballast that stores electrical energy. Often used for power factor correction and lamp regulation.

### **Case Quantity or Standard Package Quantity**

Number of product units packed in a master case. Also known as Standard Package Quantity.

### **Cathode**

Metal filaments that emit electrons in a fluorescent lamp. Negatively charged free electrons emitted by the cathode are attracted to the positive electrode (anode), creating an electric current between the electrodes.

### **Cathode Resistance**

Resistance of the cathode in a Fluorescent lamp. It is measured "cold" before the lamp is turned on (Rc) or "hot" after the lamp is turned on (Rh). The ratio of the hot resistance to the cold resistance is also measured (Rh/Rc).

### **Center Beam Candlepower (CBCP)**

Refers to the luminous intensity at the center of the beam of a blown or pressed reflector lamp (such as a PAR lamp). Measured in candelas.

### **Centigrade (C)**

Celsius temperature scale where  $0^{\circ}\text{C}=32^{\circ}\text{F}$ .

### **Ceramic Metal Halide (CMH®)**

A type of metal halide lamp that uses a ceramic material for the arc tube instead of glass quartz, resulting in better color rendering (>80 CRI) and improved lumen maintenance. GE ConstantColor® CMH® lamps feature a 3-piece arc tube design that delivers excellent color consistency and lamp reliability.

### **ChromaFit**

A GE brand name for metal halide lamps designed to operate on HPS ballasts, allowing a user to switch from the yellowish color of HPS to the white color of metal halide without changing ballasts. These products are available in both quartz metal halide and ceramic metal halide (CMH) versions.

### **Chromaticity**

Measure to identify the color of a light source, typically expressed as (x,y) coordinates on a chromaticity chart (See COLOR TEMPERATURE).

**Chromaticity Coordinates**

A system for measuring the color of the light emitted from a light source--either a primary source like a lamp or a secondary source like an illuminated object. Usually two numbers, x and y coordinates ranging from 0 to 1 specify the chromaticity.

**Circle E**

Designates a ballast meets or exceeds the requirements of Public Law 100-357 establishing standards of efficiency.

**Class P Thermal Protector**

A switching device sensitive to current and heat that automatically disconnects ballast if the temperature exceeds UL temperature limitations.

**Coefficient of Utilization (CU)**

In general lighting calculations, the fraction of initial lamp lumens that reach the work plane. CU is a function of luminaire efficiency, room surface reflectances and room shape.

**Coil**

Windings of copper or aluminum wire surrounding the steel core in ballast. Also refers to the entire assembly comprising the inductor or transformer.

**Color Rendering Index (CRI)**

An international system used to rate a lamp's ability to render object colors. The higher the CRI (based upon a 0-100 scale) the richer colors generally appear. CRI ratings of various lamps may be compared, but a numerical comparison is only valid if the lamps are close in color temperature. CRI differences among lamps are not usually significant (visible to the eye) unless the difference is more than 3-5 points.

**Color Rendering Indicator**

Draws attention to the fact that this is a lamp with high color rendering, which helps objects and persons illuminated to appear more true to life.

**Color Temperature (Correlated Color Temperature - CCT)**

A number indicating the degree of "yellowness" or "blueness" of a white light source. Measured in kelvins, CCT represents the temperature an incandescent object (like a filament) must reach to mimic the color of the lamp. Yellowish-white ("warm") sources, like incandescent lamps, have lower color temperatures in the 2700K-3000K range; white and bluish-white ("cool") sources, such as cool white (4100K) and natural daylight (6000K), have higher color temperatures. The higher the color temperature the whiter, or bluer, the light will be (See CHROMATICITY).

**Compact Fluorescent Lamp (CFL)**

The general term applied to fluorescent lamps that are single-ended and that have smaller diameter tubes that are bent to form a compact shape. Some CFLs have integral ballasts and medium or candelabra screw bases for easy replacement of incandescent lamps.

**Constant Color®**

A GE Registered name for lamp families which show very little color shift over life. Generally applies to GE's PRECISE MR-16 and GE's CMH (Ceramic Metal Halide) lamps.

**Coolbeam**

(See DICHROIC REFLECTOR)

**Cool White**

A term loosely used to denote a color temperature of around 4100 K. The Cool White (CW) designation is used specifically for T12 and other fluorescent lamps using halophosphors and having a CRI of 62.

**Core**

Component of electromagnetic ballast that is surrounded by the coil. Core is comprised of steel laminations or solid ferrite material.

**Core & Coil Ballast**

A ballast that uses a "Core & Coil" assembly to operate fluorescent or HID lamps. Refers to copper windings on a steel core.

**Cosine-Corrected**

An illuminance meter that measures the light level correctly irrespective of the angle the light is coming from. (See ILLUMINANCE METER)

**Cost of Light**

Usually refers to the cost of operating and maintaining a lighting system on an ongoing basis. The 88-8-4 rule states that (typically) 88% is the cost of electricity, 8% is labor and only 4% is the cost of lamps.

**covRguard®**

A special plastic shielding on the outside of tubular fluorescent lamps that effectively contains shattered glass particles if the lamp is broken. Such protection is mandated in many industries and locations, e.g. food packaging.

**Crest Factor (Lamp Current Crest Factor)**

Ratio of peak to RMS for any AC waveform. Crest factor can refer to voltage crest factor or current crest factor.

**Current Type (AC/DC)**

Whether the operational voltage is based on Alternating Current or Direct Current.

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### **Daylight Harvesting**

Lighting design for building interiors that makes use of daylight as a way of reducing energy consumption.

### **Daylight Lamp**

A lamp resembling the color of daylight, typically with a color temperature of 5500 K to 6500K

### **Diamond Precise®**

Diamond Precise is the GE trade name for its line-voltage MR16 ConstantColor® halogen lamp. An integral ballast and a medium screw base enable Diamond Precise lamps to operate on standard (120 volt) circuits. The MR16 technology of Diamond Precise allows a tighter, more intense beam than can be attained by the 50-watt PAR20 and R20 types it's designed to replace, even though the lumen output is significantly less by comparison.

### **Dichroic Reflector (or Filter)**

A reflector (or filter) that reflects one region of the spectrum while allowing the other region(s) to pass through. A reflector lamp with a dichroic reflector will have a "cool beam" i.e. most of the heat has been removed from the beam by allowing it to pass through the reflector while the light has been reflected.

### **Dimmable**

Whether or not the lamp lumens can be varied while maintaining reliability.

### **Dimmer, Dimming Control**

A device used to lower the light output of a source, usually by reducing the wattage it is being operated at. Dimming controls are increasing in popularity as energy conserving devices.

### **Distance Between Legs**

For U-shaped Fluorescent lamps, this measurement is the average distance between the inner walls of the legs.

### **Distance Between Leg Centers**

For U-shaped Fluorescent lamps, this measurement is the average distance between the centers of each leg.

### **Distance Outside Legs**

For U-shaped Fluorescent lamps, this measurement is the average distance to the outside of each leg.

### **Department of Transportation (DOT) Type**

The US Department of Transportation lamp number stamped in the glass lens or on the base of headlamps.

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**ECE R37 Code**

European Common Market Regulation 37 standard lamp number.

**Eccentricity (Maximum)**

In High Intensity Discharge lamps the Bulb to Arc Angle is the angle off of center between electrodes and bulb. The Bulb to Base Angle is the angle off of center that the bulb is from the base.

**Ecolux®**

A term for GE lamps that have reduced mercury content and pass the TCLP test (See TCLP TEST).

**GE Edison™**

GE's trademark for a wide range of lighting products.

**GE Edison Award**

An annual competition where lighting designers submit their best projects. The entries are judged by an international panel and awards are presented at a banquet accompanying Light Fair, the North American trade show for the lighting industry.

**Efficacy**

A measurement of how effective the light source is in converting electrical energy to lumens of visible light. Expressed in lumens-per-watt (LPW) this measure gives more weight to the yellow region of the spectrum and less weight to the blue and red region where the eye is not as sensitive.

**Efficiency**

The efficiency of a light source is simply the fraction of electrical energy converted to light, i.e. watts of visible light produced for each watt of electrical power with no concern about the wavelength where the energy is being radiated. For example, a 100 watt incandescent lamp converts 7% of the electrical energy into light; discharge lamps convert 25% to 40% into light.

The efficiency of a luminaire or fixture is the percentage of the lamp lumens that actually comes out of the fixture (See LUMINOUS EFFICACY).

**Electrical Discharge**

A condition under which a gas becomes electrically conducting and becomes capable of transmitting current, usually accompanied by the emission of visible and other radiation. An electric spark in air is an example of an electrical discharge, as is a welder's arc and a lightning bolt. (See ARC, ELECTRODELESS LAMPS)

### **Electrical Testing Laboratory (ETL)**

Independent testing laboratory that performs ballast tests and certifies accuracy of performance data.

### **Electrode**

Any metal terminal emitting or collecting charged particles, typically inside the chamber of a gas discharge lamp. In a fluorescent lamp, the electrodes are typically metal filaments coated with special powders called emission mix. Negatively charged free electrons emitted by one electrode are attracted to the positive electrode (anode), creating an electric current and arc between electrodes.

### **Electrodeless Lamps**

Light sources where the discharge occurs in a chamber with no electrodes (no metal.) The energy for the discharge is supplied by radio frequency excitation, e.g. microwaves (See GENURA).

### **Electromagnetic Ballast (Magnetic Ballast)**

A ballast used with discharge lamps that consists primarily of transformer-like copper windings on a steel or iron core. Also called "Core and Coil". (See ELECTRONIC BALLASTS).

### **EMI (Electromagnetic Interference)**

High frequency electronic ballasts and other electronic devices can produce a small amount of radio waves which can interfere with radio and TV. Federal mandated requirements must be met for EMI levels before an electronic device is considered FCC compliant. (FCC is the Federal Communications Commission.)

### **Electromagnetic Spectrum**

A continuum of electric and magnetic radiation that can be characterized by wavelength or frequency. Visible light encompasses a small part of the electromagnetic spectrum in the region from about 380 nanometers (violet) to 770 nanometers (red) by wavelength.

### **Electronic Ballast**

A short name for a fluorescent high frequency electronic ballast. Electronic ballasts use solid state electronic components and typically operate fluorescent lamps at frequencies in the range of 25-35 kHz. The benefits are: increased lamp efficacy, reduced ballast losses and lighter, smaller ballasts compared to electromagnetic ballasts. Electronic ballasts may also be used with HID (high intensity discharge) lamps (See ELECTROMAGNETIC BALLAST).

### **Elliptical Reflector (ER) Lamp**

An incandescent lamp with a built-in elliptically-shaped reflecting surface. This shape produces a focal point directly in front of the lamp which reduces the light absorption in some types of luminaires. It is particularly effective at increasing the efficacy of baffled downlights.

**Enclosed Fixtures**

(See OPEN FIXTURE RATED)

**Energy Policy Act (EPACT)**

Comprehensive energy legislation passed by the U. S. Congress in 1992. The lighting portion includes lamp labeling and minimum energy efficacy (lumens/watt) requirements for many commonly used incandescent and fluorescent lamp types. Federal Canadian legislation sets similar minimum energy efficacy requirements for incandescent reflector lamps and common linear fluorescent lamps.

**Energy Policy Act (EPACT) Indicator**

Means this lamp is Federally regulated for Energy Efficiency (See ENERGY POLICY ACT).

**Eye Sensitivity**

A curve depicting the sensitivity of the human eye as a function of wavelength (or color). The peak of human eye sensitivity is in the yellow-green region of the spectrum. The normal curve refers to photopic vision or the response of the cones. (See Photopic, Scotopic, Fovea, Foveal vision)

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**Federal Communications Commission (FCC)**

The U. S. Federal agency that regulates emissions in the radio frequency portion of the electromagnetic spectrum. Part 18 of the FCC rules specifies electromagnetic interference (EMI) from lighting devices operating at frequencies greater than 9 kilohertz (kHz). Typical electronically-ballasted compact fluorescent lamps operate in the 24 - 100 kHz frequency range.

**Field Angle**

The angular dimension of the cone of light from reflectorized lamps (such as R and PAR types) encompassing the central part of the beam out to the angle where the intensity is 10% of maximum (See BEAM ANGLE).

**Filament**

Metal tungsten wire heated by the passage of electrical current, used to emit light in incandescent lamps. In fluorescent lamps the filament is coated with emission mix and emits electrons when heated.

**Filament Design**

Filaments are designated by a letter combination in which C is a coiled wire filament, CC is a coiled wire that is itself wound into a larger coil, and SR is a straight ribbon filament. Numbers represent the type of filament-support arrangement.

**Filament Voltage**

Filaments are designed to get to operating temperature when an appropriate voltage is applied, e.g. 120 volts or 12 volts in the case of incandescent lamps or MR16 lamps. In certain fluorescent lamps the filament voltage is the low voltage applied to the cathode to energize it for electron emission.

**Fixture Requirements**

Describes fixture requirements for HID lamps.

O = Open or Enclosed Fixtures

E = Enclosed Fixtures Only

S = Lamps operated in a vertical position (Base Up or Down)  $\pm 15^\circ$ , can be used in an open fixture. Lamps burned in any other orientation must be used in "enclosed fixtures only." See additional details in the e-Catalog Help Menu under the HID category.

**Flicker**

The periodic variation in light level caused by AC operation that can lead to strobe effects.

**Flood**

Used to refer to the beam pattern of a reflector lamp, which disperses the light over a wide beam angle, typically 20 degrees or more. ("Flood" as opposed to "spot")

**Floodlight**

A luminaire used to light a scene or object to a level much brighter than its surroundings. Usually floodlights can be aimed at the object or area of interest.

**Fluorescence**

A physical phenomenon whereby an atom of a material absorbs a photon of light and immediately emits a photon of longer wavelength. If there is a significant delay the phenomenon is called phosphorescence rather than fluorescence. It is interesting that "phosphors" used in lamps exhibit "fluorescence," not "phosphorescence." (See PHOSPHOR)

**Fluorescent Lamp**

A high efficiency lamp utilizing an electric discharge through inert gas and low pressure mercury vapor to produce ultraviolet (UV) energy. The UV excites phosphor materials applied as a thin layer on the inside of a glass tube which makes up the structure of the lamp. The phosphors transform the UV to visible light.

**Foot Candles**

A unit of illuminance or light falling onto a surface. It stands for the light level on a surface one foot from a standard candle. One footcandle is equal to one lumen per square foot. See also Lux.

**Footcandle Meter**

(See ILLUMINANCE METER).

**Footlambert**

An obsolete term referring to a luminance of 1/? candelas per square foot.

**Four-Pin Compact Fluorescent Lamps**

A "plug-in" compact fluorescent lamp with 4 pins in the base to make electrical contact with the ballast.

**Frequency**

Rate of alternation in an AC current. Expressed in cycles per second or Hertz (Hz).

**Fovea, Foveal Vision**

A small region of the retina corresponding to what an observer is looking straight at. This region is populated almost entirely with cones, while the peripheral region has increasing numbers of rods. Cones have a sensitivity peaking in the yellow and corresponding to the eye response curve (See PHOTOPIC, SCOTOPIC, EYE SENSITIVITY).

**Full Spectrum Lighting**

A marketing term, typically associated with light sources that are similar to some forms of natural daylight (5000K and above, 90+ CRI), but sometimes more broadly used for lamps that have a smooth and continuous color spectrum.

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**General Lighting**

(See AMBIENT LIGHTING)

**Genura®**

GE's electrodeless compact fluorescent lamp, Genura, uses induction to power the discharge. The chamber generates UV (just like a discharge in a regular fluorescent lamp) that is converted by phosphors to visible light. Because Genura uses no electrodes, the life of this unique reflector lamp is longer than typical compact fluorescent products (See Electrodeless lamps).

**Glare**

Visual discomfort caused by excessive brightness is called discomfort glare. If task performance is affected it is called disability glare. Glare can be direct glare or indirect (reflected) glare (See VEILING REFLECTIONS and VISUAL COMFORT PROBABILITY).

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**Halogen Lamp**

A halogen lamp is an incandescent lamp with a filament that is surrounded by halogen gases, such as iodine or bromine. Halogen gases allow the filaments to be operated at higher temperatures and higher efficacies. The halogen participates in a tungsten transport cycle, returning tungsten to the filament and prolonging lamp life.

**Halogen-IR (HIR) Lamp**

GE designation for high-efficiency tungsten halogen lamps. HIR lamps utilize shaped filament tubes coated with numerous layers of materials that transmit light but reflect the heat (infrared) back into the filament. This reduces the power needed to keep the filament hot.

**Harmonic**

An integral multiple of the fundamental frequency (60 Hz) that becomes a component of the current.

**Harmonic Distortion**

Distortion of an AC waveform caused by multiples of the fundamental frequency (harmonics). Odd triplet harmonics (thirds, ninths, etc.) may result in large currents on the neutral line in a four-wire Wye three-phase system.

**Hertz (Hz)**

Unit used to measure frequency of alteration of current or voltage

**High-Bay Lighting**

Lighting designed for (typically) industrial locations with a ceiling height of 25 feet and above.

**High Efficiency (Energy Saving) Electromagnetic Ballast**

Ballast with core & coils, designed to minimize ballast losses compared to the "standard" ballast.

**High Intensity Discharge (HID) Lamp**

A general term for mercury, metal halide (GE ConstantColor® CMH®, Multi-Vapor®, MXR or Arcstream®) and high-pressure sodium (GE Lucalox®) lamps. HID lamps contain compact arc tubes which enclose mercury and various gases with other chemicals and operate at relatively high pressures and temperatures.

**High Power Factor**

A ballast whose power factor is corrected to 90% or greater by the use of a capacitor.

**High-Pressure Sodium (HPS) Lamp**

HPS lamps are high intensity discharge light sources that produce light by an electrical discharge through sodium vapor operating at relatively high pressures and temperatures. GE markets these lamps under the trade name of Lucalox®.

**Hot Restart Time**

Time it takes for a High Intensity Discharge lamp to reach 90% of light output after going from on to off to on.

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**I-Line**

A GE designation for a family of metal halide lamps which will operate on a mercury ballast. Designed as a simple retrofit for mercury lamp.

**Ignitor**

An electronic device providing a high voltage pulse to initiate an electrical discharge. Typically, the ignitor is paired with or is a part of the ballast (See STARTER).

**Illuminance**

The "density" of light (lumens/area) incident on a surface; i.e. the light level on a surface. Illuminance is measured in footcandles or lux.

**Illuminance Meter**

A device that measures the illuminance at a location calibrated either in footcandles or in lux. (Also know as a light meter -- See COSINE CORRECTED)

**Incandescent Lamp**

A light source that generates light utilizing a thin filament wire (usually of tungsten) heated to white heat by an electric current passing through it.

**Indirect Lighting**

The method of lighting a space by directing the light from luminaires upwards towards the ceiling. The light scattered off the ceiling produces a soft, diffuse illumination for the entire area.

**Induction Lighting**

Gases can be excited directly by radio-frequency or microwaves from a coil that creates induced electromagnetic fields. This is called induction lighting and it differs from a conventional discharge, which uses electrodes to carry current into the arc. Induction lamps have no electrodes inside the chamber and generally, therefore, have longer life than standard lamps. Genura® is an example of an induction lamp.

**Infrared Radiation**

Electromagnetic energy radiated in the wavelength range of about 770 to 1,000,000 nanometers. Energy in this range cannot be seen by the human eye, but can be sensed as heat by the skin.



**Input Voltage**

Power supply voltage required for proper operation of fluorescent or HID ballast.

**Input Watts**

The total power input to the ballast which includes lamp watts and ballast losses. The total power input to the fixture is the input watts to the ballast or ballasts and is the value to be used when calculating cost of energy and air conditioning loads.

**Instant Start**

Lamp starting method in which lamps are started by high voltage input with no preheating of lamp filaments. Some rapid start lamps are designed so that they may be instant started. (See RAPID START).

**Instant Start Lamp**

A fluorescent lamp, usually with a single pin at each end, approved to operate on instant start ballasts. The lamp is ignited by a high voltage without any filament heating.

**Integral**

A popular term for a compact fluorescent lamp which includes a built-in ballast (See CFL).

**Inverse Square Law**

Formula stating that if you double the distance from the light source, the light level goes down by a factor of 4, if you triple the distance, it goes down by a factor of 9, and so on.

**Isocandela Plot**

A plot with lines connecting points of equal luminous intensity around a source.

**Isolux Plot (or Isofootcandle Plot)**

A line plotted to show points of equal illuminance (lux or footcandles) on a surface illuminated by a source or sources.

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**Kelvin**

A unit of temperature starting from absolute zero, parallel to the Celsius (or Centigrade) scale. 0C is 273K.

**Kilowatt (kW)**

The measure of electrical power equal to 1000 watts.

**Kilowatt Hour (kWh)**

The standard measure of electrical energy and the typical billing unit used by electrical utilities for

electricity use. A 100-watt lamp operated for 10 hours consumes 1000 watt-hours (100 x 10) or one kilowatt-hour. If the utility charges \$.10/kWh, then the electricity cost for the 10 hours of operation would be 10 cents (1 x \$.10)

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### **Laminations**

Layers of steel, making up the "core" that is surrounded by the coils in a core & coil ballast.

### **Lamp**

The term used to refer to the complete light source package, including the inner parts as well as the outer bulb or tube. "Lamp", of course, is also commonly used to refer to a type of small light fixture such as a table lamp.

### **Lamp Current Crest Factor**

Ratio of peak lamp current to RMS or average lamp operating current.

### **Lamp Description**

The lamp's identification code. For Projection lamps, this is a 3-letter-number code uniquely identifying the lamp for ordering purposes. In some instances, lamps with 3-letter (ANSI) codes are offered in more than one design voltage, in which case the voltage required should also be specified when ordering. Some GE Projection Lamps have an ordering code comprising of two or more 3-letter ANSI codes - such as EM/EKS and DYS/DYV/BHC. The first code is the ANSI code, the secondary codes identify which lamp the multiple-coded lamp can directly replace. Only the first code appears on the lamp itself. Multiple-coded lamps are so-designated by General Electric for the convenience of the customer. In nearly all cases, Miniature and Sealed Beam lamps are marked with a General Electric Trade number recorded with ANSI.

### **Lamp Filament**

(See ELECTRODE).

### **Lamp Height**

Referenced by IEC as Dimension C. Also referred to as "Base Face to Top of Lamp".

### **Lamp Types**

Filament lamps: Incandescent, Halogen, Halogen-IR.

Discharge Lamps: Fluorescent, HID (High Intensity Discharge)

HID Lamps: Mercury, HPS (High Pressure Sodium), MH (Metal Halide) and CMH (Ceramic Metal Halide)

### **Lamp Watts**

Input power used to operate lamps.

## Lamp Width

Referenced by IEC as Dimension A.

## Lens

A transparent or semi-transparent element which controls the distribution of light by redirecting individual rays. Luminaires often have lenses in addition to reflectors.

## Life

(See RATED LAMP LIFE).

## Light

Radiant energy that can be sensed or seen by the human eye. Visible light is measured in lumens.

## Light Center Length (L.C.L.)

The distance between the center of the filament, or arc tube, and a reference plane - usually the bottom of the lamp base. Refer to the following chart for reference plane locations.

Base type	L.C.L Reference Plane Location
All screw bases (except Mini-Can)	Bottom of base contact
Mini-Can	Where diameter of ceramic base insulator is .531 inches
3-Contact Medium	Bottom of base contact
Mogul Medium Prefocus	Top of base fins
Mogul Prefocus	Top of base fins
Medium BiPost	Base end of bulb (Glass lamps) Bottom of ceramic base (Quartz lamps)
Mogul BiPost	Shoulder of posts (Glass lamps) Bottom of ceramic base (Quartz lamps)
2-Pin Prefocus	Bottom of ceramic base
S.C. or D.C. Bayonet Candelabra	Top of base pins
Medium Bayonet	Top of base pins
S.C. or D.C. Prefocus	Plane of locating bases on prefocus collar
Medium 2-Pin	Bottom of metal base shell

## Light Emitting Diode (LED)

A solid that directly converts electrical impulses into light. Some LED's today incorporate fluorescent materials to change the color characteristics of the emitted light.

## Lighting Application

(See APPLICATION).

## Lighting Industry Federation (LIF) Code

For Stage & Studio lamps, these are assigned by the Lighting Federation of London U.K. They

ensure electrical and mechanical interchangeability of similarly coded lamps. LIF codes are divided into groups according to the primary application of the lamps.

### **Light Loss Factor**

The product of all factors that contribute to lowering the illumination level including reflector degradation, dirt, lamp depreciation over time, voltage fluctuations, etc.

### **Light Meter**

(See ILLUMINANCE METER)

### **Light Pollution**

Light that is directed to areas where it is not needed, and thereby interferes with some visual act. Light pollution directed or reflected into the sky creates a "dome" of wasted light and makes it difficult to see stars above cities.

### **Light Trespass (Spill Light)**

Light that is not aimed properly or shielded effectively can spill out at into areas that don't want it: it can be directed towards drivers, pedestrians or neighbors. It is distracting and annoying and can sometimes be disabling.

### **Lumens**

A measure of the luminous flux or quantity of light emitted by a source. For example, a dinner candle provides about 12 lumens. A 60-watt Soft White incandescent lamp provides about 840 lumens.

### **Lumens/Watts**

A ratio expressing the luminous efficacy of a light source. Typical lamp efficacies:

- Thomas Edison's first lamp - 1.4 lpW
- Incandescent lamps - 10-40
- Halogen incandescent lamps - 20-45
- Fluorescent lamps - 35-105
- Mercury lamps - 50-60
- Metal halide lamps - 60-120
- High-pressure sodium lamps - 60-140

Note: The values above for discharge lamps do not include the effect of the ballasts, which must be used with those lamps. Taking ballast losses into account reduces "system" or lamp-ballast efficacies typically by 10-20% depending upon the type of ballast used.

### **Lumen Maintenance**

A measure of how well a lamp maintains its light output over time. It may be expressed numerically or as a graph of light output vs. time.

**Luminaire Efficiency**

The ratio of total lumens emitted by a luminaire to those emitted by the lamp or lamps used in that luminaire.

**Luminous Efficacy**

(See EFFICACY)

**Luminaire**

A complete lighting unit consisting of a lamp (or lamps), ballast (or ballasts) as required together with the parts designed to distribute the light, position and protect the lamps and connect them to the power supply. A luminaire is often referred to as a fixture.

**Luminance**

A measure of "surface brightness" when an observer is looking in the direction of the surface. It is measured in candelas per square meter (or per square foot) and was formerly referred to as "photometric brightness."

**Lux (lx)**

A unit of illuminance or light falling onto a surface. One lux is equal to one lumen per square meter. Ten lux approximately equals one footcandle. (See FOOTCANDLE)

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**Maximum Overall Length (M.O.L.)**

The end-to-end measurement of a lamp, expressed in inches or millimeters.

**Mean Lumens**

The average light output of a lamp over its rated life. Based on the shape of the lumen depreciation curve, for fluorescent and metal halide lamps, mean lumens are measured at 40% of rated lamp life. For mercury, high-pressure sodium and incandescent lamps, mean lumen ratings refer to lumens at 50% of rated lamp life (See Lumen Maintenance).

**Medium Base**

Usually refers to the screw base typically used in household incandescent lamps. There is also the medium bipin base commonly used in T12 and T8 fluorescent lamps.

**Mercury Lamp**

A high-intensity discharge light source operating at a relatively high pressure (about 1 atmosphere) and temperature in which most of the light is produced by radiation from excited mercury vapor. Phosphor coatings on some lamp types add additional light and improve color rendering.

**Metal Cases**

Case design used in both magnetic and electronic ballasts. These ballasts are grounded once they are mounted to the fixture. They meet all safety codes, some of which do not allow plastic in open plenum areas.

**Metal Halide Lamp**

A high intensity discharge light source in which the light is produced by the radiation from mercury, plus halides of metals such as sodium, scandium, indium and dysprosium. Some lamp types may also utilize phosphor coatings. GE trade names include: Multi-Vapor®, ConstantColor® CMH®, PulseArc®, Staybright®, Watt-Miser®, ChromaFit and Arcstream®.

**Mesopic**

Typically referring to nighttime outdoor lighting conditions, the region between PHOTOPIC and SCOTOPIC vision (See SCOTOPIC).

**Mod-U-Line®**

A GE registered name for a family of U-shaped fluorescent lamps, both T8 and T12.

**Mogul Base**

A screw base used on larger lamps, e.g. many HID lamps.

**Monochromatic Light**

Light with only one wavelength (i.e. color) present.

**Mounting Height**

Distance from the bottom of the fixture to either the floor or work plane, depending on usage.

**MR-16 and MR-11**

A line of low voltage compact reflector lamps used for accent and spot lighting. The 16 and 11 refer to 16 eighths of an inch diameter and 11 eighths.

**Multi-Vapor®**

A GE brand for metal halide lamps.

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**National Electric Code (NEC)**

A nationally accepted electrical installation code to reduce the risk of fire, developed by the National Fire Protection Association.

### **National Energy Standards for Fluorescent Ballasts**

A federal law enacted in 1988 that sets energy standards for ballasts consistent throughout the United States.

### **National Stock Number**

The standardized part number used by the US Government for procurement.

### **Nanometer**

A unit of wavelength equal to one billionth of a meter.

### **NOM**

Laboratory that sets safety standards for building materials, electrical appliances and other products for Mexico.

### **Non-PCB Capacitor**

Capacitor used in ballasts to help provide power factor correction. Contains no polychlorinated biphenyls and meets EPA requirements.

### **Normal Power Factor**

Ballasts with power factor less than .90 and do not incorporate any means of Power Factor Correction.

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### **Open Circuit Voltage (OCV)**

Open Circuit Voltage measured across the socket the lamp screws into, with the ballast powered on. It is dangerous to stick a voltmeter into such a socket without precise knowledge of the ballast because exceedingly high voltages could be present.

### **Open Fixture Rated**

Lamps that are approved for burning in open fixtures (as opposed to enclosed fixtures which have an acrylic lens or plate glass enclosure).

### **Operating Position or Burn Position**

Mercury and High Pressure Sodium lamps may be operated in any burn position and will still maintain their rated performance specifications. Metal Halide and Low Pressure Sodium lamps, however, are optimized for performance in specific burn positions, or may be restricted to certain burn positions for safety reasons.

U = Universal burning position

HBU = Horizontal -15° to Base Up

HBD = Horizontal +15° to Base Down

HOR = Horizontal  $\pm 15^\circ$

H45 = Horizontal to  $-45^\circ$  only

VBU = Vertical Base Up  $\pm 15^\circ$

VBD = Vertical Base Down  $\pm 15^\circ$

If no special burn position is noted, the burn position is universal.

### **Operating Voltage**

For electrical discharge lamps, this is the voltage measured across the discharge when the lamp is operating. It is governed by the contents of the chamber and is somewhat independent of the ballast and other external factors.

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### **Parallel Lamp Operation**

Refers to ballasts that employ multiple output current paths from a single ballast to allow lamps to operate independent of one another, allowing other lamps operated by the ballast to remain lit should companion lamp(s) fail.

### **PAR Lamp**

PAR is an acronym for parabolic aluminized reflector. A PAR lamp, which may utilize either an incandescent filament, a halogen filament tube or a HID arc tube, is a precision pressed-glass reflector lamp. PAR lamps rely on both the internal reflector and prisms in the lens for control of the light beam.

### **PCB (Polychlorinated Biphenyls)**

Chemical pollutant formerly used in ballast capacitors that were part of ballasts. It is now illegal to use PCB's and most such ballasts have been replaced over time.

### **Phosphor**

An inorganic chemical compound processed into a powder and deposited on the inner glass surface of fluorescent tubes and some mercury and metal-halide lamp bulbs. Phosphors are designed to absorb short wavelength ultraviolet radiation and to transform and emit it as visible light (See FLOURESCENCE).

### **Photometry**

The measurement of light and related quantities.

### **Photopic**

Vision for which the cones in the eye are responsible; typically at high brightness and in the foveal or central region (See SCOTOPIC, FOVEA, FOVEAL VISION).



**Plug-In**

(See CFL).

**Potting**

Material used to completely surround and cover components of some magnetic and electronic ballasts. Potting compound fulfills functions of protecting components, dampening sound, and dissipating heat.

**Power Factor**

Measurement of the relationship between the AC source voltage and current. High power factor ballasts require less AC operating current at the same wattage than an equivalent low power factor ballast.

Formula: Power Factor equals Input Watts divided by the product of Line Volts times Line Amps (Volt Amps or VA).

**Power Factor Corrected**

Ballasts that incorporate a means of Power Factor Correction but whose power factor is 90% or greater.

**Power-Groove®**

A GE name for its line of "highest output fluorescent lamps," featuring a grooved bulb that increases effective arc length by 10%.

**Precise™**

The GE trade name for the compact MR-16 and MR-11 low-voltage halogen dichroic "cool beam" reflectorized spot and flood lamps.

**Preheat Circuit**

A type of fluorescent lamp-ballast circuit used with the first commercial fluorescent lamp products. A push button or automatic switch is used to preheat the lamp cathodes to a glow state. Starting the lamp can then be accomplished using simple "choke" or reactor ballasts.

**Preheat Lamp**

A fluorescent lamp in which the filament must be heated by use of a starter before the arc is created. These lamps are typically operated with electromagnetic ballasts.

**Product Code**

It is important to use this five-digit code when ordering to ensure that you receive the exact product you require.

**Programmed Rapid Start**

Lamp starting method which preheats the lamp filaments while not allowing the lamp to ignite and then applies the open circuit voltage (OCV) to start the lamp. The user may experience a half- to

one-second delay after turning on the lamps while the pre-heating takes place. This type of starting circuit keeps lamp end blackening to a minimum and improves lamp life performance, especially in applications where the lamps are frequently switched on and off.

### **PulseArc®**

GE description for a type of metal halide lamp that provides improved lumen maintenance for longer useful life and extended relamp cycles. These products are designed to operate on ballasts that have ignitors to help with lamp starting.

### **Pulse Start**

An HID ballast with a high voltage ignitor to start the lamp.

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### **Quad**

Generally refers to a compact fluorescent lamp containing 4 U-shaped tubes, i.e. Quad Biax®, as opposed to Triple Biax® (3 tubes) and Double Biax® (2-tubes).

### **Quartz**

A name for fused silica or melted sand from which many high-temperature containers are fashioned in the lighting industry. Quartz looks like glass but can withstand the high temperatures needed to contain high intensity arc discharges.

### **Quartz-Halogen Lamp**

(See HALOGEN LAMPS).

### **Quartzline®**

A GE registered trademark term for some types of linear halogen lamps.

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### **Radiation**

A general term for the release of energy in a "wave" or "ray" form. All light is radiant energy or radiation, as is heat, UV, microwaves, radio waves, etc.

### **Rapid Start Circuit**

A fluorescent lamp-ballast circuit that utilizes continuous cathode heating, while the system is energized, to start and maintain lamp light output at efficient levels. Rapid start ballasts may be either electromagnetic, electronic or of hybrid designs. Full-range fluorescent lamp dimming is only possible with rapid start systems (See INSTANT START).

**Rapid Start**

Lamp starting method in which lamp filaments are heated while open circuit voltage (OCV) is applied to facilitate lamp ignition.

**Rapid Start Lamp**

A fluorescent lamp with two pins at each end connected to the filament. The filaments are heated by the ballast to aid in starting. Some rapid start lamps may be instant started without filament heat, for example, the F32T8 lamp.

**Rated Lamp Life**

For most lamp types, rated lamp life is the length of time of a statistically large sample between first use and the point when 50% of the lamps have died. It is possible to define "useful life" of a lamp based on practical considerations involving lumen depreciation and color shift (See LIFE).

**Reflectance**

The ratio of light reflected from a surface to that incident upon it.

**Reflector Lamp (R)**

A light source with a built-in reflecting surface. Sometimes, the term is used to refer specifically to blown bulbs like the R and ER lamps; at other times, it includes all reflectorized lamps like PAR and MR.

**Reveal®**

GE's product family of incandescent lamps with the element Neodymium added to the glass bulb. Neodymium filters out much of the yellow light produced by ordinary lamps. Less yellow means whites look whiter and colors appear more vibrant in spaces lighted with Reveal lamps.

**Room Cavity Ratio (RCR)**

A shape factor (for a room, etc.) used in lighting calculations.

$RCR = 5H (L+W) / L \times W$ , or, alternately,

$RCR = (2.5) \text{ Total Wall Area} / \text{Floor Area}$ .

Where H = height, L = length and W = width of the room.

A cubical room will have an RCR of 10; the flatter the room the lower the RCR.

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**Saf-T-Gard®**

A GE registered trademark for a line of HID lamps (Mercury or Metal Halide) which will self-extinguish shortly after the outer bulb is broken or ruptured. This prevents the possibility of the arc tube continuing to operate and causing sunburns in people sitting under the lamps.

**State and County Code (SCC)**

The full 14 digit case code used on GE's content label.

**Scotopic**

Vision where the rods of the retina are exclusively responsible for seeing, typically like the light levels in the countryside on a moonless, starlit night (See also PHOTOPIC, FOVEA, FOVEAL VISION MESOPIC).

**Scotopic/Photopic (S/P) Ratio**

This measurement accounts for the fact that of the two light sensors in the retina, rods are more sensitive to blue light (scotopic vision) and cones to yellow light (photopic vision). The scotopic/photopic (S/P) ratio is an attempt to capture the relative strengths of these two responses. S/P is calculated as the ration of scotopic lumens to photopic lumens for the light source on an ANSI reference ballast. Cooler sources (higher color temperatures lamps) tend to have higher values of the S/P ratio compared to warm sources.

**Screw-In**

(See CFL).

**Seal Temperature (Maximum)**

The maximum operating temperature of the seal of the lamp in Celsius.

**Self-Ballasted Lamps**

A discharge lamp with an integral ballasting device allowing the lamp to be directly connected to a socket providing line voltage (See CFL).

**Series Lamp Operation**

Refers to ballasts that employ a single current path passing through all lamps operated by the ballast. If one lamp should fail, companion lamps operated by the same ballasts will also extinguish or dim.

**Source Size**

For Projection lamps, this is defined as the dimensions of the rectangular area, centered on the lamp axis, within which all luminous parts of the filament lie, when viewed perpendicular to the axis of the filament coil or to the plane of C-13 and C-13D filaments.

**Spacing to Mounting Height Ratio**

Ratio of fixture spacing (distance apart) to mounting height above the work plane; sometimes called spacing criterion. It is OK to have fixture spaced closer than the spacing criterion suggested by the manufacturer but not farther, or you will get dark spots in-between fixtures.

**Specification Series (SP) Colors**

Energy-efficient, all-purpose, tri-phosphor fluorescent lamp colors that provide good color rendering. The CRI for SP colors is 70 or above and varies by specific lamp type.

**Specification Series Deluxe (SPX) Colors**

Energy-efficient, all-purpose, tri-phosphor fluorescent lamp colors that provide better color rendering than Specification Series (SP) colors. The CRI for SPX colors is 80 or above and varies by specific lamp type. All GE CFL products use SPX phosphors.

**Spectral Power Distribution (SPD)**

A graph of the radiant power emitted by a light source as a function of wavelength. SPDs provide a visual profile or "finger print" of the color characteristics of the source throughout the visible part of the spectrum.

**Spectrum**

See SPECTRAL POWER DISTRIBUTION (SPD).

**Specular Reflection**

Reflection from a smooth, shiny surface, as opposed to diffuse reflection.

**Spiral® Lamp**

GE trademark for its helical family of high-efficiency, long-life compact fluorescent lamps.

**Spot**

A colloquial term referring to a reflector lamp with a tight beam of light, typically around 10 degrees or less. It comes from the fact that such a lamp produces a narrow spot of light as opposed to a wide flood of light.

**SPXX**

A Color Designation for GE Ceramic Metal Halide Lamps with superior Color Rendering ~ 90.

**Standard Alternating Current Frequency in the United States**

60 Hertz (Hz) or 60 cycles per second.

**Starcoat®**

GE's special barrier coating applied on the inside of all GE T8 fluorescent lamps, as well as some other lamp types, to enhance lamp life and deliver superior lumen maintenance.

**Starter**

An electronic module or device used to assist in starting a discharge lamp, typically by providing a high-voltage surge (See IGNITOR).

**Starting Temperature (Minimum)**

The minimum ambient temperature at which the lamp will start reliably.

**Sunburn**

Skin reddening and inflammation caused by overexposure to sources containing UV-B and/or UV-C.

## **System**

A term referring to the lamp and ballast combination, and sometimes to the entire lighting delivery system including the fixture, the optics, the particular layout and the lighting controls.

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## **T-12, T-8, T-5**

A designation for the diameter of a tubular bulb in eighths of an inch; T-12 is 12 eighths of an inch, or 1 1/2 inches; T-8 is 1 inch, and so on.

## **Task Lighting**

Supplemental lighting provided to assist in performing a localized task, e.g. a table lamp for reading or an inspection lamp for fabric inspection.

## **TCLP Test**

The Toxicity Characteristic Leaching Procedure (TCLP) test, specified in the Resource Conservation and Recovery Act (RCRA) of 1990, is used to characterize fluorescent lamp waste as hazardous or nonhazardous waste. The TCLP test measures the ability of the mercury and/or lead in a lamp to leach from a landfill into groundwater (See ECOLUX).

## **THD**

(See TOTAL HARMONIC DISTORTION)

## **Terminal to Terminal Starting Lamp Voltage (VRMS) (Minimum or Maximum)**

The minimum or maximum allowed voltage allowed into lamp from ballast under varying conditions as specified.

## **Total Harmonic Distortion (THD)**

A measure of the distortion of the input current on alternating current (AC) power systems caused by higher order harmonics of the fundamental frequency (60Hz in North America). THD is expressed in percent and may refer to individual electrical loads (such as ballast) or a total electrical circuit or system in a building. ANSI C82.77 recommends THD not exceed 32% for individual commercial electronic ballasts, although some electrical utilities may require lower THDs on some systems. Excessive THDs on electrical systems can cause efficiency losses as well as overheating and deterioration of system components.

## **Transients**

High voltage surges through an electrical system caused by lightning strikes to nearby transformers, overhead lines or the ground. May also be caused by switching of motors or compressors, as well as by short circuits or utility system switching. Can lead to premature ballast failure.

**Troffer**

A long, recessed lighting unit, usually installed in an opening in the ceiling.

**Tungsten-Halogen Lamp**

(See HALOGEN LAMP).

**Two-Pin Compact Fluorescent Lamps**

Type of lamps that have the glow bottle starter built into the base of the lamp. Traditionally 2-pin lamps are designed to work with electromagnetic ballasts.

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**Uniform Code Council (UCC)**

The 12 digit case code derived from the last 12 digits of the 14 digit SCC code on GE's case content label.

**Underwriters' Laboratories (UL)**

A private organization which tests and lists electrical (and other) equipment for electrical and fire safety according to recognized UL and other standards. A UL listing is not an indication of overall performance. Lamps are not UL listed except for compact fluorescent lamp assemblies - those with screw bases and built-in ballasts.

**Uniform Product Code (UPC)**

The 12 digit code on the saleable unit that is used for scanning at the register.

**UltraMax™ Ballast**

A family of high-efficiency GE instant-start electronic linear fluorescent ballasts designed to optimize GE's T8 Ultra lamps for enhanced system energy savings. UltraMax ballasts have a low lamp current crest factor and virtually "read" and adapt to incoming voltage from 108V to 305V. Other features include UL Type CC Anti-Arc Rating and anti-striation control to eliminate lamp striations and spiraling. GE also has an UltraMax HID ballast which can operate PulseArc and CMH lamps anywhere from 250 watts to 400 watts and provides greatly improved lumen maintenance.

**Ultra**

A common way of referring to high efficiency GE T8 family of lamps that perform better than standard T8 lamps. Also refers to the system.

**Ultraviolet (UV) Radiation**

Radiant energy in the range of about 100-380 nanometers (nm). For practical applications, the UV band is broken down further as follows:

- Ozone-producing - 180-220 nm
- Bactericidal (germicidal) - 220-300
- Erythema (skin reddening) - 280-320
- "Black" light - 320-400

The International Commission on Illumination (CIE) defines the UV band as UV-A (315-400 nm); UV-B (280-315 nm) and UV-C (100-280 nm).

### **Ultra Watt-Miser®**

GE's family of energy-saving T8 fluorescent lamps.

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### **Valance Lighting**

Lighting from light sources on a wall typically above eye level, shielded by horizontal panels. The light may be upward or downward directed.

### **Veiling Reflection**

Effective reduction in contrast between task and its background caused by the reflection of light rays; sometimes called "reflected glare." You might have dealt with veiling reflections when you have to tilt a shiny magazine to avoid glare so as to read it, or struggled with reading a computer monitor because of the reflection of a window or a light fixture (See GLARE).

### **Visual Comfort Probability (VCP)**

For a given lighting scheme, VCP is a ratio expressed as a percent of people who, when viewing from a specific location and in a specified direction, find the system acceptable in terms of glare (See GLARE).

### **Visual Task**

The task associated with seeing; objects and details that must be seen to perform an activity.

### **Volt**

A measure of "electrical pressure" between two points. The higher the voltage, the more current will be pushed through a resistor connected across the points. The volt specification of an incandescent lamp is the electrical "pressure" required to drive it at its designed point. The "voltage" of a ballast (e.g. 277 V) refers to the line voltage it must be connected to.

### **Voltage**

A measurement of the electromotive force in an electrical circuit or device expressed in volts. Voltage can be thought of as being analogous to the pressure in a waterline.



**Voltage (Design)**

For Automotive lamps, voltage at which the lamp is designed to provide the amperes, candlepower, and laboratory life characteristics. For Projection lamps, the voltage shown is the design voltage of the lamp, on which the life and wattage ratings are based. Lamps for which 115-120 is shown in the Volts column are designed at 118 volts. Lamps are available only in the design voltage(s) shown. When ordering lamps listed for more than one voltage, be sure to specify the voltage required. (Supply voltage variation can significantly affect lamp life.)

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**Wall Temperature (Maximum Bulb)**

The maximum operating bulb wall temperature in Celsius.

**Warm Up Time to 90%**

The time it takes for a High Intensity Discharge lamp to reach 90% of light output after being turned on.

**Warm White**

Refers to a color temperature around 3000K, providing a yellowish-white light.

**Watts**

A unit of electrical power. Lamps are rated in watts to indicate the rate at which they consume energy. (See KILOWATT HOUR).

**Watt-Miser®**

A Watt-Miser® lamp is a term used by GE to indicate a reduced-wattage lamp with performance characteristics (life, light output, etc.) such that it can usually directly replace a higher-wattage product. Watt-Miser® lamps are available in a wide range of incandescent, fluorescent and HID lamp types.

**Wattage Indicator Reduced**

Indicates that this is a reduced wattage option for lamps normally used in this application. Be sure to check wattage, lumens and life to determine which lamp is best suited to your needs.

**Wavelength**

The distance between two neighboring crests of a traveling wave. The wavelength of light is between 400 and 700 nanometers.

**Work Plane**

Plane at which work is done and at which illumination is specified and measured; unless otherwise indicated, it is assumed to be a horizontal plane 30 inches above the floor (table-top height) having the same area as the floor.

**Working Distance (Typical)**

For Multi-Mirror® and other reflector Quartzline® lamps and MARC™ Projection lamps, the Working Distance shown is the distance from the front surface of the reflector rim to the film plane, in the optical system for which the lamp was first designed. In most cases, it provides a uniform plane of light for the intended aperture.