

§ 435.98 Scope.

(a) The voluntary performance standards for new commercial and multi-family high rise residential buildings apply to the design of a new commercial or multi-family high rise residential building, except for the following:

(1) A building constructed and developed for residential occupancy, unless the building is a multi-family high rise residential building with 3 or more stories;

(2) Heating, cooling, ventilating, or service hot water requirements for those spaces where processes occur for purposes other than occupant comfort and sanitation, and which impose thermal loads in excess of 5% of the loads that would otherwise be required for occupant comfort and sanitation without the process;

(3) Envelope requirements for those spaces where heating or cooling requirements are excepted in paragraph (a)(2) of this section;

(4) Lighting for tasks not listed or encompassed by areas or activities listed in Table 3.5-1; and

(5) Buildings that are composed entirely of spaces listed in paragraphs (a) (2), (3), and (4) of this section.

§ 435.99 General definitions and acronyms.

(a) For the purpose of this subpart:

Accessible (as applied to equipment) means admitting close approach; not guarded by locked doors, elevation, or other effective means. (See also *Readily Accessible*.)

Adjusted Lighting Power means lighting power, ascribed to a luminaire(s), that has been reduced by deducting a lighting power control credit based on use of an automatic control device.

Annual Fuel Utilization Efficiency means the ratio of annual output energy to annual input energy that includes any non-heating season pilot input loss.

Air Conditioning, Comfort means treating air to control its temperature, relative humidity, cleanliness, and distribution to meet the comfort requirements of the occupants of the conditioned space. Some air conditioners may not accomplish all of these controls.

Ambient Lighting means lighting that produces general illumination throughout an area.

Area Factor means a multiplying factor that adjusts the base unit power density (UPD) for spaces of various sizes to account for the impact of room configuration on lighting power utilization.

Automatic means a self-acting, operating by its own mechanism, when actuated by some impersonal influence, such as, a change in current strength, pressure, temperature or mechanical configuration. (See also *Manual*.)

Ballast means a device used with an electric-discharge lamp to obtain the necessary circuit conditions (voltage, current, and wave form) for starting and operating.

Ballast Efficacy Factor—Fluorescent means the ratio of the relative light output to the power input in watts, at specified test conditions, expressed as a percent.

Ballast Factor means the ratio of a commercial ballast lamp lumens to a reference ballast lamp lumens, used to correct the lamp lumen output from rated to actual.

Boiler Capacity means the rated heat output in Btu/h of the boiler, at the design inlet and outlet conditions and rated fuel/energy input.

British Thermal Unit means approximately the amount of heat required to raise the temperature of one pound of water from 59 °F to 60 °F.

Building means any new structure to be constructed that includes provision for a heating or cooling system, or both, or for a hot water system.

Building Code means a legal instrument which is in effect in a state or unit of general purpose local government, the provisions of which must be adhered to if a building is to be considered to be in conformance with law and suitable for occupancy and use.

Building Design means the architectural and engineering drawings and specifications used for the construction of a new building.

Building Energy Cost means the computed annual energy cost of all purchased energy for the building, calculated using the methods of section 435.111 of these standards.

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Building Envelope means the elements of a building that enclose conditioned spaces through which thermal energy may be transferred to or from the exterior or to or from unconditioned spaces.

Building Type means the classification of a building by usage. In this regulation the following classifications of buildings are defined by these uses:

(1) *Assembly* means a building or structure for the gathering together of persons, such as auditoriums, churches, dance halls, gymnasiums, theaters, museums, passenger depots, sports facilities, and public assembly halls.

(2) *Health and Institutional* means a building or structure for the purpose of providing medical treatment, confinement or care, and sleeping facilities such as hospitals, sanitariums, clinics, orphanages, nursing homes, mental institutions, reformatories, jails, and prisons.

(3) *Hotel/Motel* means a building or structure for transient occupancy, such as resorts, hotels, motels, barracks, and dormitories.

(4) *Multi-Family* means a building or structure containing three or more dwelling units. (See *Dwelling Units*, and *Multi-Family Dwelling*.)

(5) *Office (Business)* means a building or structure for office, professional, or service type transactions, such as medical offices, banks, libraries, and business offices, including governmental office buildings.

(6) *Restaurant* means a building or a structure for the consumption of food or drink, including fast food, coffee shops, cafeterias, bars, and restaurants.

(7) *Retail (Mercantile)* means a building or a structure for the display and sale (wholesale or retail) of merchandise, such as shopping malls, food markets, auto dealerships, department stores, and specialty shops. (See also *Retail Establishments*.)

(8) *School (Educational)* means a building or structure for the purpose of instruction, such as schools, colleges, universities, and academies.

(9) *Warehouse (Storage)* means a building or structure for storage, such as aircraft hangers, garages, warehouses, storage buildings, and freight depots.

Check Metering means measurement instrumentation for the supplementary monitoring of energy (electric, gas, oil, etc.) consumption, in addition to the revenue metering furnished by the utility, to isolate the various categories of energy use to permit conservation and control.

Coefficient of Performance—Cooling means the ratio of the rate of heat removal to the rate of energy input in consistent units, for a complete cooling system or factory assembled equipment, as tested under a nationally recognized standard or designated operating conditions.

Coefficient of Performance, Heat Pump—Heating means the ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system under designated operating conditions. When checking compliance with the heat pump equipment COP's listed in the tables in section 435.108.

Combined Thermal Transmittance Values (See *Thermal Transmittance, Overall*.)

Commercial Building means a building other than a residential building, including any building developed for industrial or public purposes.

Conditioned Floor Area means the area of the conditioned space measured at floor level from the interior surfaces of the walls.

Conditioned Space means a volume within a building that is designed to be heated and/or cooled, directly or indirectly.

Connected Lighting Power means the power required to energize luminaires and lamps installed and connected to the building electrical service, in watts.

Control Loop, Local means a control system consisting of a sensor, a controller, and a controlled device.

Cooled Space means an enclosed area within a building that has a refrigeration system whose sensible capacity exceeds 5 Btu/h•ft² or is capable of maintaining space dry bulb temperatures of 90 °F or less at design cooling conditions.

Daylight Sensing Control means a device that automatically regulates the power input to electric lighting near

the fenestration to maintain the desired workplace illumination, thus taking advantage of direct or indirect sunlight.

Dead Band (Dead Zone) means the range of values within which an input variable can be varied without initiating any noticeable change in the output variable.

Default Assumption means the value of an input used in a calculation procedure when a value is not entered by the designer.

Degree-Day means a unit, based upon temperature difference and time, used in estimating fuel consumption and specifying nominal heating load of building in winter. For any day, when the mean temperature is less than a reference temperature, typically 65 °F, there are as many Degree-Days as Fahrenheit degrees difference in temperature between the mean temperature for the day and the reference temperature.

Degree Day, Cooling means a unit, based upon temperature difference and time, used in estimating cooling energy consumption. For any one day, when the mean temperature is more than a reference temperature, typically 65 °F, there are as many Degree Days as degrees Fahrenheit temperature difference between the mean temperature for the day and the reference temperature. Annual Cooling Degree Days (CDD) are the sum of the degree days over a calendar year.

Degree Day, Heating means a unit, based upon temperature difference and time, used in estimating heating energy consumption. For any one day, when the mean temperature is less than a reference temperature, typically 65 °F, there are as many Degree Days as degrees Fahrenheit temperature difference between the mean temperature for the day and the reference temperature. Annual Heating Degree Days (HDD) are the sum of the degree days over a calendar year.

Demand (Electric) means the rate at which electric energy is delivered to or by a system, part of a system, or a piece of equipment; expressed in kilowatts, kilovoltamperes; or other suitable units at a given instant or averaged over any designated period.

Design Conditions means the exterior and interior environmental parameters specified for air conditioning and electrical design for a facility.

Design Energy Consumption means the computed annual energy usage of a proposed building design.

Design Energy Costs means the computed annual energy expenditures of a proposed building design.

Dwelling Unit means a single house-keeping unit comprised of one or more rooms providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking, and sanitation.

Economizer, Air means a ducting arrangement and automatic control system that allows a cooling supply fan system to supply outside air to reduce or eliminate the need for mechanical refrigeration during mild or cold weather.

Economizer, Water means a system by which the supply air of a cooling system is cooled directly and/or indirectly by evaporation of water, or by other appropriate fluid, in order to reduce or eliminate the need for mechanical refrigeration.

Efficiency, HVAC System means the ratio of the useful energy output (at the point of use) to the energy input in consistent units for a designated time period, expressed in percent.

Emergency System (Back Up System) means a system which exists for the purpose of operating in the event of failure of a primary system.

Energy means the capability for doing work; having several forms that may be transformed from one to another, such as thermal (heat), mechanical (work), electrical, and chemical.

Energy Cost means the annual cost of energy by unit and type of energy.

Energy Cost Budget means the maximum allowable computed annual energy expenditure for a proposed building.

Energy Efficiency Ratio means the ratio of net equipment cooling capacity in Btu/h to total rate of electric input in watts under designated operating conditions. When consistent units are used, this ratio becomes equal to COP. (See also *Coefficient of Performance*.)

Energy Management System means a control system designed to monitor the environment and the use of energy in a facility and to adjust the parameters of local control loops to conserve energy while maintaining a suitable environment.

Energy, Recovered (See *Recovered Energy*.)

Enthalpy means a thermodynamic property of a substance defined as the sum of its internal energy plus the quantity PV/J , where P =pressure of the substance, V =its volume, and J =the mechanical equivalent of heat; formerly called total heat and heat content.

Exterior Envelope (See *Building Envelope*.)

Fenestration means any light-transmitting section in a building wall or roof. The fenestration includes glazing material, which may be glass or plastic; framing, mullions, muntins, and dividers; external shading devices; internal shading devices, and integral (between-glass) shading devices.

Federal Agency means any department, agency, corporation, or other entity or instrumentality of the executive branch of the Federal Government, including the United States Postal Service, the Federal National Mortgage Association, and the Federal Home Loan Mortgage Corporation.

Federal Building means any building to be constructed by, or for the use of, any Federal Agency which is not legally subject to State or local building codes or similar requirements.

Footcandle means the unit of illuminance on a surface one square foot in area on which there is a uniformly distributed flux of one lumen, or the illuminance produced on a surface all points of which are at a distance of one foot from a directionally uniform point source of one candela.

General Lighting means lighting designed to provide illumination throughout an area, exclusive of any provision for special local requirements.

Gross Floor Area means the sum of the areas of the several floors of the building, including basements, mezzanine and intermediate-floored tiers and penthouses of headroom height, measured from the exterior faces of exterior

walls or from the centerline of walls separating buildings, but excluding covered walkways, open roofed-over areas, porches and similar spaces, pipe trenches, exterior terraces or steps, chimneys, roof overhangs, and similar features.

Gross Lighted Area means the sum of the total lighted areas of a building measured from the inside of the perimeter walls, for each floor of the building.

Gross Roof Area means the total surface of the roof assembly exposed to the outside air, including all roof/ceiling and skylight components through which heat may flow between indoor and outdoor environments, excluding service openings.

Gross Exterior Wall Area means the total surface of the wall assembly exposed to the outside air and enclosing a heated or cooled space consisting of opaque surfaces, including between floor spandrels, peripheral edges of flooring and window areas including sash and door areas but excluding vents, grilles, and pipes.

HVAC System means the equipment distribution network and terminals that provide either collectively or individually the processes of heating, ventilating, and/or air conditioning to a building.

HVAC System Efficiency (See *Efficiency, HVAC System*.)

Heat means the form of energy that is transferred by virtue of a temperature difference or a change in state of a material.

Heat Capacity means the amount of heat necessary to raise the temperature of a given mass one degree. Numerically the mass multiplied by the specific heat.

Heated Space means a volume within a building which is provided with a positive supply of thermal energy by a system whose output capacity either exceeds 10 Btu/h•ft² or is capable of maintaining a space dry-bulb temperature of 50 °F or more at design building conditions.

Heating System Performance Factor means the total heating output of a heat pump during its normal annual usage period for heating, in Btu, divided by the total electric energy input during the same period, in watt-hours.

Heat Trap means a device coupled to the inlet and outlet of a water heater that effectively restricts the natural tendency of hot water to rise in the vertical pipe during periods of standby.

Humidistat means an automatic control device responsive to changes in humidity.

Illuminance means the density of the luminous flux incident on a surface. It is the quotient of the luminous flux multiplied by the area of the surface when the latter is uniformly illuminated. (See also *Footcandle*.)

Industrial Process means any manufacturing or other process whose energy requirements are not primarily intended to contribute to the heating, cooling, lighting, ventilation, or service hot water energy load requirements of the building.

Infiltration means the uncontrolled inward air leakage through cracks and crevices in any building element and around windows and doors of a building.

Insolation means the rate of solar energy incident on a unit area with a given orientation.

Integrated Part-Load Value means a single number figure of merit for airconditioning and heat pump equipment based on weighted operation at a set of less than full capacities for the equipment.

Lighting Power Budget means the lighting power, in watts, allowed for an interior or exterior area or activity.

Lighting Power Control Credit means the amount of interior connected lighting power which may be added to the Interior Lighting Power Allowance for lights in a space which is turned off or dimmed by automatic control devices.

Lumen means 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 (one steradian) by a point source having a uniform luminous intensity of one candela.

Lumen Maintenance Control means a device that senses the illumination level and causes an increase/decrease of illumination to maintain a preset illumination level.

Luminaire means a complete lighting unit consisting of a lamp or lamps to-

gether with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply.

Luminaire Efficiency means the ratio of luminous flux (lumens) emitted by a luminaire to that emitted by the lamp or lamps used therein.

Manual (Non-Automatic) means action requiring personal intervention for its control. As applied to an electric controller, non-automatic control does not necessarily imply a manual controller, but only that personal intervention is necessary. (See *Automatic*.)

Marked Rating means the design load operating conditions of a device as shown by the manufacturer on the nameplate or otherwise marked on the device.

Minimum Life Cycle Cost Methodology means the methodology specified in subpart A of 10 CFR part 436.

Motor Efficiency, Nominal means the median efficiency occurring in a population of motors of the same manufacturer and rating.

Multi-Family High Rise Residential Building means a residential building containing three or more dwelling units and is designed to be 3 or more stories above grade.

Multi-Family Low Rise Residential Building means a residential building containing three or more dwelling units and is designed not to exceed two stories above grade.

Non-Depletable Energy Sources means sources of energy, excluding minerals, derived from incoming solar radiation; thermal chemical or electrical energy derived directly from conversion of incident solar radiation; wind, waves and tides, lake, or pond thermal differences; and energy derived from the internal heat of the earth.

Occupancy Sensor means a device that detects the presence or absence of people within an area and causes lighting, equipment, and/or appliances to be adjusted accordingly.

Opaque Areas means all exposed areas of a building envelope which enclose conditioned space, except fenestration areas and building service openings, such as vents, grilles, and pipes.

Orientation means the directional placement of a building on a building site with reference to the building's

longest horizontal axis, or, if none, with reference to the designated main entrance.

Outdoor (Outside) Air means air taken from the exterior of the building that has not been previously circulated through the building. (See also *Ventilating Air*.)

Ozone Depletion Factor means a relative measure of the potency of chemicals in depleting stratospheric ozone. The ozone depletion factor potential depends upon the chlorine and the bromine content and atmospheric lifetime of the chemical. The depletion factor potentials are normalized such that the factor for CFC-11 is set equal to unity and the factors for the other chemicals indicate their potential relative to CFC-11.

Packaged Terminal Air-Conditioner means a factory-selected wall sleeve and separate unencased combination of heating and cooling components, assemblies or sections, intended for mounting through the wall to serve a single room or zone. It includes heating capability by hot water, steam, or electricity.

Packaged Terminal Heat Pump means a PTAC capable of using the refrigeration system in a reverse cycle or heat pump mode to provide heat.

Piping means a system for conveying fluids, including pipes, valves, strainers, and fittings.

Plenum means an enclosure that is part of the air handling system and is distinguished by having a very low air velocity. A plenum often is formed in part or in total by portions of the building.

Power means, in connection with machines, the time rate of doing work; in connection with the transmission of energy of all types, the rate at which energy is transmitted; in inch-pound units, is measured in watts (W) or British thermal units per hour (Btu/h).

Power Adjustment Factor means a modifying factor that adjusts the effective connected lighting power of a space to account for the use of energy conserving lighting control devices.

Power Factor means the ratio of total watts to the root-mean-square (RMS) volt amperes.

Prescribed Assumption means a fixed value of an input to the standard calculation procedure.

Process Energy means energy consumed in support of a manufacturing, industrial, or commercial process, other than the maintenance of comfort and amenities for the occupants of a building.

Process Load means the calculated or measured time-integrated load on a building resulting from the consumption or release of process energy.

Proposed Design means a prospective design for a building that is to be evaluated for compliance.

Prototype Building means a generic building design of the same size and occupancy type as the proposed design, which complies with the prescriptive requirements of the standards and has prescribed assumptions used to generate the energy budget concerning shape, orientation, HVAC, and other system designs.

Public Facility Restroom means a restroom used by the transient public.

Radiant Comfort Heating means a system in which temperatures of room surfaces are adjusted to control the rate of heat loss by radiation from occupants.

Readily Accessible means capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, and so on. (See also *Accessible*.)

Recooling means lowering the temperature of air that has been previously heated by a heating system.

Recovered Energy means energy utilized which would otherwise be wasted (not contributing to a desired end use) from an energy utilization system.

Reference Building means a specific building design that has the same form, orientation and basic systems as the proposed design and meets all the criteria of the prescriptive compliance method.

Reflectance means the ratio of the light reflected by a surface to the light incident upon it.

Reheating means raising the temperature of air that has been previously cooled either by a refrigeration or an economizer system.

Reset means adjustment of the controller set point to a higher or lower value automatically or manually.

Residential means any structure which is constructed and developed for residential occupancy.

Retail Establishments means, for the purpose of determining lighting power limit, buildings, the primary functions of which are designed to be:

(1) Type A—Jewelry Merchandising, where the minute display and examination of merchandise is critical.

(2) Type B—Fine Merchandising: Fine apparel and accessories, china, crystal and silver, art galleries, etc., where the detailed display and examination of merchandise is important.

(3) Type C—Mass Merchandising, where focused display and detailed examination of merchandise is important.

(4) Type D—General Merchandising: General apparel, variety, stationery, books, sporting goods, hobby, cameras, gift, luggage, etc., where general display and examination of merchandise are adequate.

(5) Type E—Food & Miscellaneous: Bakeries, hardware and housewares, grocery, appliances and furniture, etc., where appetizing appearance is important.

(6) Type F—Service Establishments, where functional performance is important.

Roof means those portions of the building envelope including all opaque surfaces, fenestration, doors, and hatches which are above conditioned space and which are horizontal or tilted at less than 45° from horizontal. (See also *Walls*.)

Room Air Conditioner means an enclosed assembly designed as a unit to be mounted in a window or through a wall, or as a console. It is designed primarily to provide free delivery of conditioned air to an enclosed space, room, or zone. It includes a prime source of refrigeration for cooling and dehumidification and means for circulating and cleaning air, and may also include means for ventilating and heating.

Seasonal Energy Efficiency Ratio means the total cooling output of an air conditioner during its normal annual usage period for cooling, in Btu/h,

divided by the total electric energy input during the same period, in watt-hours, as determined by 10 CFR, part 430.

Service Systems means all energy-using or distributing components in a building that are operated to support the occupant or process functions housed therein, including HVAC, service water heating, illumination, transportation, cooking or food preparation, laundering or similar functions.

Service Water Heating means the supply of hot water for purposes other than comfort heating and process requirements.

Service Water Heating Demand means the maximum design rate of water withdrawal from a service water heating system in a designated period of time (usually an hour or a day).

Shading Coefficient means the ratio of solar heat gain through fenestration, with or without integral shading devices, to that occurring through unshaded 1/8 inch thick clear, double strength glass.

Shell Building means a building for which the envelope is designed and/or constructed prior to knowing the occupancy type. (See also *Speculative Building*.)

Speculative Building means a building for which the envelope is designed and/or constructed prior to the design of the lighting and/or HVAC systems. A speculative building differs from a shell building in that the intended occupancy is known for the speculative building. (See also *Shell Building*.)

Standard Calculation Procedure means an energy simulation model, and a set of input assumptions, that produce estimates of annual energy consumption for heating, cooling, ventilation, lighting, and other uses and that account for the dynamic thermal performance of the building.

System means a combination of equipment and/or controls, accessories, interconnecting means, and terminal elements by which energy is transformed so as to perform a specific function, such as HVAC, service water heating, or illumination.

Tandem Wiring means pairs of luminaires operating with one lamp in each luminaire powered from a single

two-lamp ballast contained in the other luminaire.

Task Lighting means lighting that provides illumination for specific visual functions and is directed to a specific surface or area.

Task Location means an area of the space where significant visual functions are performed and where lighting is required above and beyond that required for general ambient use.

Terminal Element means a device by which the transformed energy from a system is finally delivered; *i.e.*, registers, diffusers, lighting fixtures, faucets, etc.

Thermal Conductance means the constant time rate of heat flow through unit area of a body induced by a unit temperature difference between the surfaces, $\text{Btu/ft}^2 \cdot \text{h} \cdot ^\circ\text{F}$ or $\text{Btu/h} \cdot ^\circ\text{F}$. It is reciprocal of thermal resistance. (See *Thermal Resistance*.)

Thermal Mass means materials with mass heat capacity and surface area capable of affecting building loads by storing and releasing heat as the interior and/or exterior temperature and radiant conditions fluctuate. (See also *Wall Heat Capacity*.) Thermal Mass Wall Insulation Position:

(1) *Exterior Insulation Position* means a wall having all or nearly all of its mass exposed to the room air with the insulation on the exterior of that mass.

(2) *Integral Insulation Position* means a wall having mass exposed to both room and outside air, with substantially equal amounts of mass on the inside and outside of the insulation layer.

(3) *Interior Insulation Position* means a wall not meeting either of the above definitions, particularly a wall having most of its mass external to an insulation layer.

Thermal Resistance means the reciprocal thermal conductance; $1/C$ as well as $1/h$, $1/U$, $\text{h} \cdot \text{ft}^2 \cdot ^\circ\text{F}/\text{Btu}$.

Thermal Transmittance means the overall coefficient of heat transfer from air to air. It is the time rate of heat flow per unit area under steady conditions from the fluid on the warm side of the barrier to the fluid on the cold side, per unit temperature difference between the two fluids, $\text{Btu/h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$.

Thermal Transmittance, Overall means the gross overall (area weighted average) coefficient of heat transfer from air to air for a gross area of the building envelope, $\text{Btu/h} \cdot \text{ft}^2 \cdot ^\circ\text{F}$. The thermal transmittance (U°) value applies to the combined effect of the time rate of heat flows through the various parallel paths, such as windows, doors, and opaque construction areas, comprising the gross area of one or more building envelope components, such as walls, floors, or roof/ceiling.

Thermostat means an automatic control device responsive to temperature.

Unconditioned Space means a volume within a building that is not designed to be directly or indirectly heated and/or cooled. (See *Conditioned Space*.)

Unit Power Density means the floor area designated for a specific occupancy, function, or activity expressed in W/ft^2 .

Unitary Cooling Equipment means one or more factory-made assemblies which normally include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function as well.

Unitary Heat Pump means one or more factory-made assemblies which normally include an indoor conditioning coil, compressor(s) and outdoor coil or refrigerant-to-water heat exchanger, including means to provide both heating and cooling functions.

Unlisted Space means the difference in area between the gross lighted area and the sum of all listed spaces.

Variable Air Volume (VAV) HVAC System means HVAC systems that control the dry-bulb temperature within a space by varying the volume of supply air to the space.

Ventilation means the process of supplying or removing air by natural or mechanical means to or from any space. Such air may or may not have been conditioned.

Ventilation Air means that portion of supply air which comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space. (See also *Outdoor Air*.)

Visual Task means those details and objects that must be seen for the performance of a given activity, and includes the immediate background of the details or objects.

Voluntary Performance Standards means an energy consumption goal or goals to be met without specification of the method, materials, and processes to be employed in achieving that goal or goals, but including statements of the requirements, criteria and evaluation methods to be used, and any necessary commentary.

Walls means those portions of the building envelope enclosing conditioned space including all opaque surfaces, fenestration and doors, which are vertical or tilted at an angle of 45 ° from horizontal or greater. (See also *Roof*.)

Wall Heat Capacity means the sum of the products of the mass of each individual material in the wall per unit area of wall surface times its individual specific heat, Btu/F. (See *Thermal Mass*.)

Watt means a unit of power. One watt is produced when one ampere, flows at an amp of one volt (unity power factor). (See also *Power*.)

Zone means a space or group of spaces within a building with heating, cooling, and/or lighting requirements sufficiently similar so that desired conditions can be maintained throughout by a single controlling device.

(b) For definitions not found in paragraph (a) of this section, the 1986 edition of "Terminology of Heating and Ventilation, Air-Conditioning, and Refrigeration" as published by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc. (ASHRAE) shall apply to these standards.

(c) For purposes of this subpart, the acronyms and abbreviations shall have the following meanings:

A_o—Total Building Floor Area.

A_{wall,roof,etc.}—Area of a Specific Building component.

AAMA—American Aluminum Manufacturers Association.

ACP—Alternative Component Package.

AF—Area Factor.

AFUE—Annual Fuel Utilization Efficiency.

AHAM—Association of Home Appliance Manufacturers.

ALP—Adjusted Lighting Power.

ANSI—American National Standards Institute.

ARI—Air-Conditioning and Refrigeration Institute.

ASHRAE—American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc.

ASME—American Society of Mechanical Engineers.

ASTM—American Society for Testing and Materials.

Btu—British Thermal Unit.

Btu/h—British Thermal Units Per Hour.

C—Thermal Conductance.

C_c—Cooling Criteria.

CDD—Cooling Degree-Days.

CDD50—Cooling Degree-Days Base 50 °F.

CDD65—Cooling Degree-Days Base 65 °F.

CDH—Cooling Degree-Hours.

CDH80—Cooling Degree-Hours Base 80 °F.

CEEU—Cost Equivalent Energy Units.

cfm—Cubic Feet Per Minute.

CFR—Code of Federal Regulations.

CLP—Connected Lighting Power.

COP—Coefficient of Performance.

CU—Coefficient of Utilization.

DOE—U.S. Department of Energy.

DR—Average Daily Temperature Range for Warmest Month.

EER—Energy Efficiency Ratio.

ELPA—Exterior Lighting Power Allowance.

EPD—Equipment Power Density.

° F—Degrees-Fahrenheit

GLA—Gross Lighted Building Area.

HC—Heat Capacity.

HDD—Heating Degree-Days.

HDD50—Heating Degree-Days Base 50 °F.

HDD65—Heating Degree-Days Base 65 °F.

HI—Hydronics Institute.

HID—High Intensity Discharge.

hp—Horsepower (force).

HPS—High Pressure Sodium.

HSPF—Heating System Performance Factor.

HVAC—Heating, Ventilating and Air Conditioning.

IEEE—Institute of Electrical and Electronics Engineers, Inc.

IES—Illuminating Engineering Society of North America.

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ILPA—Interior Lighting Power Allowance.
IPLV—Integrated Part Load Value.
ILD—Internal Load Density.
IRF—Internal Reflecting Film.
ISSC—Internal Shading System Coefficient.
 K_h —Daylighting Factor.
kVA—Kilo-Volts Amperes.
kW—Kilo-Watts.
LPB—Lighting Power Budget.
LPCC—Lighting Power Control Credits.
LS—Listed Space.
NWMA—National Woodwork Manufacturers Association.
o.c.—On Center.
OLA—Occupant Load Adjustment.
OMB—U.S. Office of Management and Budget.
 P_b —Base Unit Lighting Power Allowance.
PAF—Power Adjustment Factor.
PF—Projection Factor.
PTAC—Packaged Terminal Air-Conditioner.
R—Thermal Resistance.
r—Thermal Resistivity.
 S_{ea} —Shading Horizontal Adjustment Factor.
SC—Shading Coefficient.
SEER—Seasonal Energy Efficiency Ratio.
 U_o —Average Thermal Transmittance.
UL—Underwriter’s Laboratories, Inc.
ULPA—Unit Lighting Power Allowance.
UPD—Unit Power Density.
VAV—Variable Air Volume.
VCP—Visual Comfort Probability.
VDT—Visual Display Terminal.
VLT—Visible Light Transmittance.
VSEW—Vertical Surface of the Facade.
W.C.—Water Column.
W—Watts.
 W/ft^2 —Watts Per Square Foot.
 $W/lin. ft$ —Watts Per Linear Foot.
 W_h —Window Height.
WWR—Window Wall Ratio.
WYEC—Weather Year for Energy Conservation Calculations.

§ 435.100 Explanation of numbering system for standards.

(a) For purposes of this subpart, a derivative of two different numbering systems will be used.

(1) For the purpose of designating a section, the system employed in the Code of Federal Regulations (CFR) will be employed. The number “435,” which signifies Part 435, Chapter II of Title 10, Code of Federal Regulations, is used as a prefix for all section headings. The suffix is a two or three digit number beginning with “.97.” For example, the lighting section of the standards is numbered § 435.103.

(2) Within each section, a numbering system common to many national voluntary consensus standards is used. This system was chosen because of its commonality among the buildings industry. A decimal system is used to denote sections and subsections. For example, § 9.4.2 refers to section 9, subsection 4, paragraph 2.

(b) The hybrid numbering system is used for two purposes:

(1) The use of the Code of Federal Regulation’s numbering system allows the researcher using the CFR easy access to the standards.

(2) The use of the second system allows the builder, designer, architect or engineer easy access because they are used to the system employed.

(c) To avoid confusion in the use of the two systems, § 435.101 through § 435.112, the substantive technical sections of the standards, have been numbered so that the last two digits in the suffix designate the section. For example, once the reader enters the body of § 435.105: Building Envelope, the number “5” is used to designate the section. References throughout the standard do not employ the “435” prefix but rather refer to the section by the single or double digit numbers from 1–12.

§ 435.101 Implementation and compliance procedures for Federal agencies.

Alternative methods of achieving compliance are illustrated in Figure 1.1–1.