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Building environment design — Energy efficiency — Terminology

Conception de l'environnement des bâtiments — Rendement d'énergie — Terminologie

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16818 was prepared by Technical Committee ISO/TC 205, *Building environment design*.

Introduction

This International Standard is intended to provide general terms and definitions used in building environment design. Other standards produced by ISO/TC 205 can contain additional definitions more specific to the needs of the individual standard.

Building environment design — Energy efficiency — Terminology

1 Scope

This International Standard gives terms and definitions for use in the design of energy-efficient buildings. This International Standard is applicable to new buildings and retrofitted existing buildings.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6707-1, *Building and civil engineering — Vocabulary — Part 1: General terms*

ISO 7345, *Thermal insulation — Physical quantities and definitions*

ISO 7730, *Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria*

ISO 9229, *Thermal insulation — Vocabulary*

ISO 9251, *Thermal insulation — Heat transfer conditions and properties of materials — Vocabulary*

ISO 9288, *Thermal insulation — Heat transfer by radiation — Physical quantities and definitions*

ISO 9346, *Hygrothermal performance of buildings and building materials — Physical quantities for mass transfer — Vocabulary*

ISO 13789, *Thermal performance of buildings — Transmission and ventilation heat transfer coefficients — Calculation method*

ISO 13790[1)], *Energy performance of buildings — Calculation of energy use for space heating and cooling*

ISO 15927-6, *Hygrothermal performance of buildings — Calculation and presentation of climatic data — Part 6: Accumulated temperature differences (degree-days)*

ISO 16813, *Building environment design — Indoor environment — General principles*

1) To be published. (Revision of ISO 13790:2004.)

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the normative references and the following apply.

3.1
access hatch
door

NOTE An access hatch is defined as a door, thereby allowing it to meet less stringent envelope requirements. If not defined as a door, it is necessary that it be insulated as a roof or wall, depending on where it was located.

3.2
accessible
admitting close approach; not guarded by locked doors, elevations or other effective means

NOTE As applied to equipment; see also **readily accessible** (3.189).

3.3
adjusted lighting power
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(s)

3.4
adopting authority
agency or agent that adopts this International Standard

3.5
air-conditioned floor area
area equipped with air conditioning equipment measured at floor level from the interior surfaces of the walls

See **gross conditioned floor area**, (3.106).

3.6
air-conditioned space
space equipped with air conditioning equipment

See **air-conditioned floor area** (3.5).

3.7
air economizer
duct and damper arrangement and automatic control system that together allows a cooling system to supply outside air to reduce or eliminate the need for mechanical cooling during mild or cold weather

3.8
air handling unit
encased assembly consisting of sections containing a fan or fans and other necessary equipment to perform one or more of the following functions: circulating, filtration, heating, cooling, heat recovery, humidifying, dehumidifying and mixing of air

3.9
alteration
rearrangement, replacement or addition to a building or its systems and equipment

NOTE Routine maintenance and service or a change in the building's category shall not constitute an alteration.

3.10
area factor
multiplying factor which adjusts the unit power density for spaces of various sizes to account for the impact of room configuration on lighting power utilization

3.11
area of the space
A
horizontal lighted area of a given space measured from the inside of the perimeter walls or partitions, at the height of the working surface

3.12
authority having jurisdiction
agency or agent responsible for enforcing this International Standard

3.13
automatic
self-acting, operating by its own mechanism when actuated by some impersonal intervention, such as a change in current strength, pressure, temperature or mechanical configuration

3.14
automatic control devices
device capable of automatically turning loads off and on without manual intervention

3.15
average daily temperature
average of the temperatures readings over a 24 h period

3.16
ballast
device used in conjunction with an electric-discharge lamp to cause the lamp to start and operate under the proper circuit conditions of voltage, current, wave form, electrode heat, etc.

3.16.1
ballast, electronic
ballast constructed using electronic circuitry

3.16.2
ballast, hybrid
ballast constructed using a combination of magnetic core, insulated wire winding and electronic circuitry

3.16.3
ballast, magnetic
ballast constructed with magnetic core and a winding of insulated wire

3.17
ballast efficacy factor
ratio of relative light output to the power input

3.18
ballast efficacy factor
⟨fluorescent⟩ ratio of the ballast factor expressed as a percent to the power input in watts, at specified test conditions

3.19
ballast factor
BF
ratio of a commercial ballast lamp lumens to a reference ballast lamp lumens, used to correct the lamp lumen output from rated to actual

3.19.1
ballast factor
ratio of the lumen output of a lamp/ballast combination to the lumen output of the same lamp in combination with a piece of laboratory equipment called a reference reactor

NOTE Because a ballast may be designed to operate more than one lamp type, the same ballast model can have more than one ballast factor value.

3.20
below-grade wall
see **wall** (3.244)

3.21
boiler
device to raise the temperature of a fluid or generate steam

3.22
boiler capacity
rated heat output of the boiler, at the design inlet and outlet conditions and rated fuel or energy input

3.23
budget building design
computer representation of a hypothetical design based on the actual proposed building design

NOTE This representation is used as the basis for calculating the energy cost budget.

3.24
building
construction as a whole, including its envelope and all technical building systems

3.25
building area
greatest horizontal area of a building above grade within the outside surface of exterior walls, or within the outside surface of exterior wall and the centreline of fire walls

3.26
building entrance
any doorway set of doors, turnstiles or other form of portal that is ordinarily used to gain access to the building by its users and occupants

3.27
building energy cost
computed annual energy cost of all purchased energy for the building

3.28
building envelope
elements of a building that enclose conditioned spaces through which thermal energy can be transferred to or from the exterior, or to or from unconditioned spaces

3.28.1
building envelope, exterior sheltered
elements of a building that separate conditioned spaces from the exterior

3.28.2
building envelope, semi-exterior sheltered
elements of a building that separate conditioned space from unconditioned space (as far as it is not designed for human occupancy) or that enclose semi-heated spaces through which thermal energy can be transferred to or from the exterior, or to or from unconditioned spaces, or to or from conditioned spaces

NOTE 1 Building envelope defines the surfaces that require insulation or weather-stripping. The outer shell of the building is not necessarily the same as the building envelope, particularly where the building contains semi-heated or unconditioned spaces.

NOTE 2 In some cases, the designer can determine the location of the exterior building envelope by the location that they place the insulation. For instance, it is not uncommon for a stairwell to be at the outside edge of the building. If that stairwell does not have any heating or cooling supply, it can be insulated on the outside edge or the side adjacent to other heated or cooled space. If insulated on the outside, the stairwell becomes indirectly conditioned and the outside wall is the exterior building envelope. If insulated on the inside, the inside wall is likely to become the exterior building envelope (unless the outside exposure is so small that it would still be indirectly conditioned space).

NOTE 3 Where a building with conditioned space also contains semi-heated spaces or unconditioned spaces, the building envelope for the conditioned space is the roofs, walls, floors, doors, fenestration, etc. that separate the conditioned space from the exterior. These elements shall comply with the residential or non-residential conditioned space requirements.

NOTE 4 For semi-heated spaces, the building envelope includes any roofs, walls, floors, doors, fenestration, etc. that separate the semi-heated space from conditioned or unconditioned spaces (as well as from the exterior). These elements shall comply with the semi-heated space requirements, as shall elements separating conditioned space from unconditioned space.

3.29
building exit
any doorway, set of doors, or other form of portal that is ordinarily used for emergency egress or convenience exit

3.30
building grounds lighting
lighting provided through a building's electrical service for parking lot, site, roadway, pedestrian pathway, loading dock, exterior architectural lighting and security applications

3.31
building official
official authorized to act on behalf of the authority having jurisdiction

3.32
building type
classification of a building by usage

3.33
check metering
measurement instrumentation for the supplementary monitoring of energy consumption (electric, gas, oil, etc.) to isolate the various categories of energy use to permit conservation and control, in addition to the revenue metering furnished by the utility

3.34
clerestory
part of a building that rises clear of the roofs or other parts and whose walls contain windows for lighting the interior

3.35
coefficient of performance
COP
⟨cooling mode⟩ 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

3.36
coefficient of performance
COP
〈heat pump — heating mode〉 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

NOTE Supplemental heat shall not be considered when checking compliance with the heat pump equipment COPs.

3.37
coefficient of utilization
CU
ratio of lumens from a luminaire calculated as received on the work plane to the lumens emitted by the luminaire's lamps alone factored by room surface reflectances and room dimensions

See **room cavity ratio** (3.202).

3.38
conditioned space
treated space
enclosure served by an air distribution system

3.39
connected lighting power
power required to energize luminaries and lamps connected to the building electrical service

NOTE The connected lighting power is expressed in units of watts.

3.40
continuous insulation
insulation that is continuous across all structural members without any thermal bridges, excluding fasteners and service openings

NOTE It is installed on the interior of, exterior of or integral with any opaque surface of the building envelope.

3.41
control
regulation of the operation of equipment

3.42
control device
specialized device used to regulate the operation of equipment

3.43
control loop, local
control system consisting of a sensor, controller and controlled device

3.44
control point
quantity of equivalent ON or OFF switches ascribed to a device used for controlling the light output of a luminaire(s) or lamp(s)

3.45
cool down
reduction of space temperature down to occupied set point after a period of shutdown or setup

3.46
cooled space
See **space** (3.217).

3.47
cooling
removal of latent and/or sensible heat

3.48
cooling degree-day
See **degree-day** (3.58).

3.49
cooling design temperature
outdoor dry-bulb temperature for sizing cooling systems, equal to the temperature that is exceeded 2,5 % of the number of hours during the nominal cooling season (June through September in northern hemisphere) in a typical weather year

3.50
cooling design wet-bulb temperature
outdoor wet-bulb temperature for sizing cooling systems and evaporative heat rejection systems, such as cooling towers

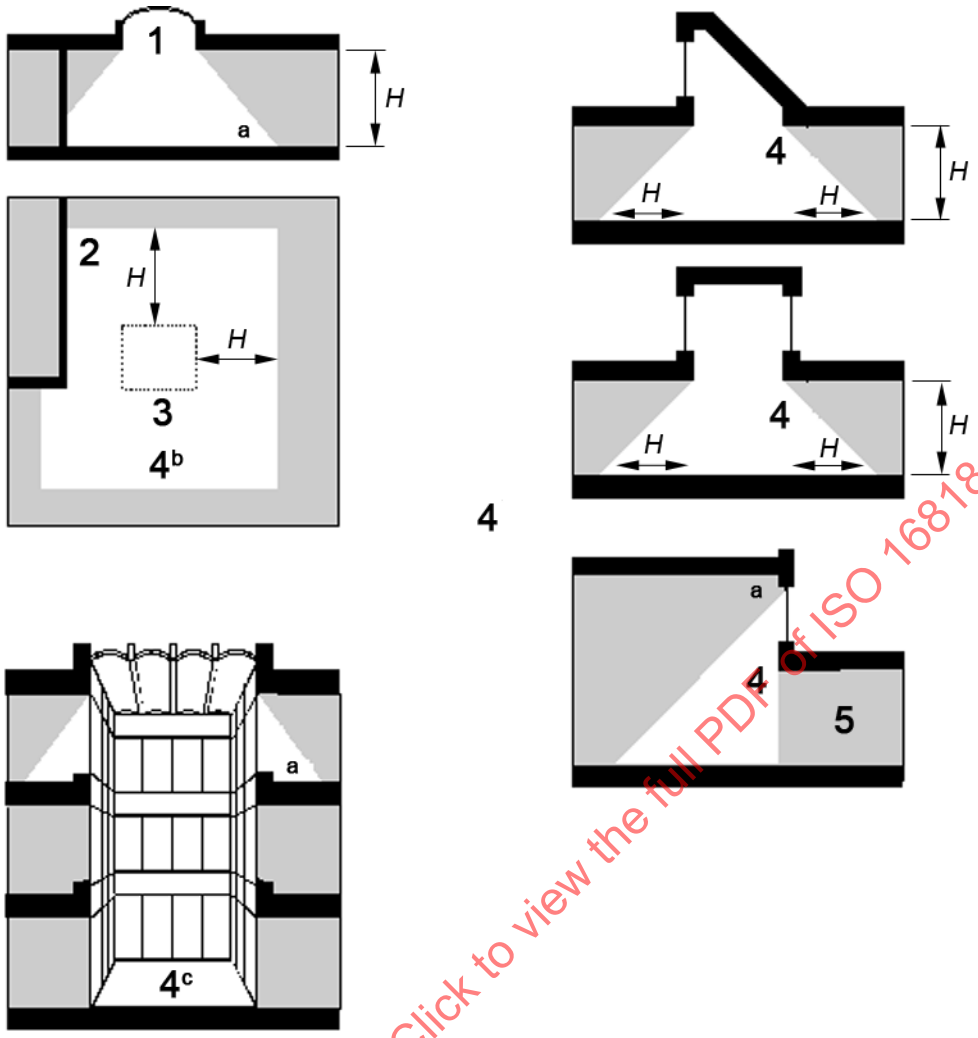
3.51
daylit area
area under horizontal fenestration (skylight) or adjacent to vertical fenestration (window) as described in 3.51.1 and 3.51.2

3.51.1
daylit area, horizontal
area under horizontal fenestration (skylight) with a horizontal dimension in each direction equal to the skylight dimension in that direction plus either the floor-to-ceiling height, the distance to the nearest 1 m or higher opaque partition, or one-half the distance to an adjacent skylight or vertical glazing clerestory, whichever is least

See Figure 1.

3.51.2
daylit area, vertical
area adjacent to vertical fenestration (window) with one horizontal dimension that extends into the space either a distance of 4,5 m, or to the nearest 1 m or higher opaque partition, whichever is less; and another horizontal dimension equal to the width of the window plus either 0,6 m on each side, the distance to an opaque partition, or one-half the distance to an adjacent skylight or window, whichever is least

See Figure 2.

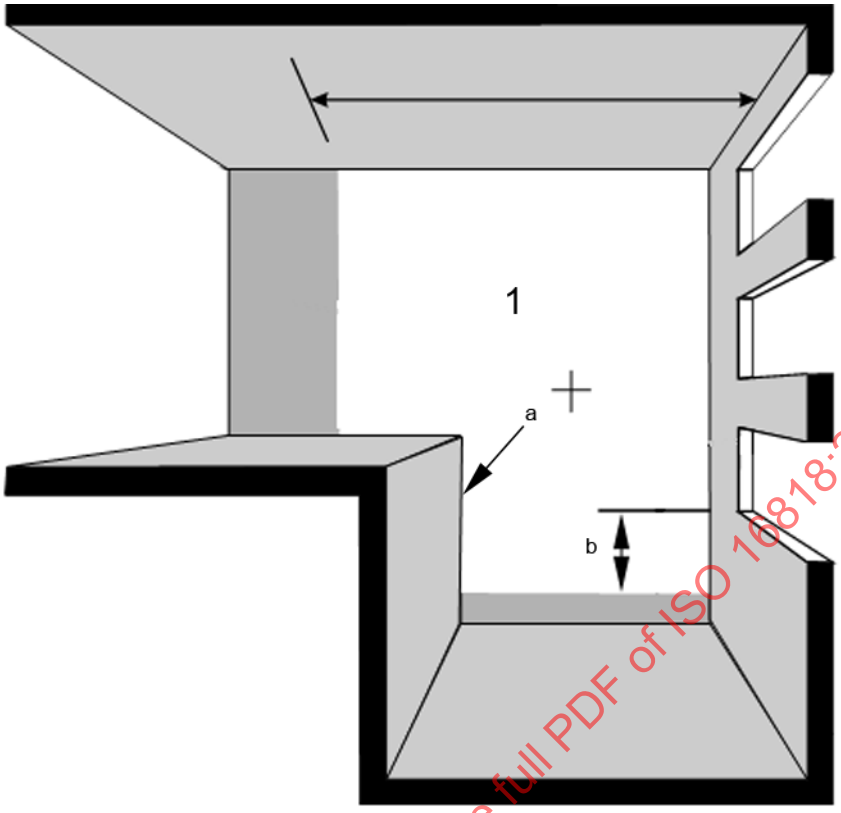


Key

1 skylight width
2 full height partition
3 outline of skylight above
4 daylit area
5 non-daylit area
H floor-to-ceiling height

a 45°.
b Daylit area beneath conventional skylight.
c Daylit area includes the floor of the atrium and the top floor next to the atrium.

Figure 1 — Horizontal daylit area



Key

1 daylit area

a Daylit area cut short by full-height partition.

b Daylit area extends 610 mm (2 ft) or to nearest wall.

Figure 2 — Vertical daylit area

3.52
daylit space
space bounded by vertical planes rising from the boundaries of the daylit area on the floor to the above floor or roof

3.53
daylit zone
types of daylit zones as defined in 3.53.1 and 3.53.2

3.53.1
daylit zone, under skylights
area under each skylight whose horizontal dimension in each direction is equal to the skylight dimension in that direction plus either the floor-to-ceiling height or the dimension to an opaque partition, or one-half the distance to an adjacent skylight or vertical glazing, whichever is least

3.53.2
daylit zone, at vertical glazing
area adjacent to vertical glazing that receives daylighting from the glazing

NOTE For purposes of this definition and unless more detailed daylighting analysis is provided, the daylit zone depth is assumed to extend into the space a distance of 4,5 m or to the nearest opaque partition, whichever is less. The daylighting zone width is assumed to be the width of the window plus either 0,6 m on each side, the distance to an opaque partition, or one half the distance to an adjacent skylight or vertical glazing, whichever is least.

3.54
daylight sensing control
DS
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

3.55
dead band
dead zone
range of values within which an input variable can be varied without initiating any noticeable change in the output variable

3.56
decorative lighting
See **lighting**, decorative (3.138).

3.57
default assumption
value of an input used in a calculation procedure when a value is not entered by the designer

3.58
degree-day
difference in temperature between the outdoor mean temperature over a 24-h period and a given base temperature

NOTE For the purposes of determining building envelope requirements, the classifications are defined in 3.58.1 and 3.58.2.

3.58.1
degree-day, cooling
for any one day, when the mean temperature is more than the base temperature, there are as many degree-days as degrees Celsius temperature difference between the mean temperature for the day and the base temperature

NOTE Annual cooling degree-days (CDDs) are the sum of the cooling degree-days over a calendar year.

3.58.2
degree-day, heating
for any one day, when the mean temperature is less than the base temperature, there are as many degree-days as degrees Celsius temperature difference between the mean temperature for the day and base temperature

NOTE Annual heating degree-days (HDDs) are the sum of the heating degree-days over a calendar year.

3.59
dehumidification
controlled reduction of water vapour from the air

3.60
demand, electric
rate at which electric energy is delivered to or by a system, a part of a system, or a piece of equipment

NOTE The electric demand is expressed in kilowatts, kilovolt amperes or other suitable units, at a given instant or averaged over any designated period.

3.61
demand energy
energy to be delivered to provide the required service with an ideal system to the end user

3.62
design capacity
output capacity of a system or piece of equipment at design conditions

3.63
design conditions
specified indoor environmental conditions, such as temperature, relative humidity, lighting level, etc., required to be produced and maintained by a system and under which the system must operate

3.64
design energy consumption
estimated annual energy usage of a proposed building design

3.65
design energy costs
estimated annual energy expenditure of proposed building design

3.66
direct digital control
DDC
type of control where controlled and monitored analogue or binary data (e.g. temperature, contact closures) are converted to digital format for manipulation and calculations by a digital computer or microprocessor, then converted back to analogue or binary form to control physical devices

3.67
distribution system
conveying means, such as ducts, pipes and wires, to bring substances or energy from a source to the point of use

NOTE The distribution system includes auxiliary equipment, such as fans, pumps and transformers.

3.68
efficiency
performance at specified rating conditions

3.69
efficiency, HVAC system
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

3.70
electric meter
mechanical/electrical device that can measure electric power

3.71
electric supplier
agency that sells and/or distributes electric power

3.72
emittance
ratio of the radiant heat flux emitted by a specimen to that emitted by a blackbody at the same temperature and under the same conditions

3.73
enclosed space
volume substantially surrounded by solid surfaces, such as walls, floors, roofs, and “open-able” devices such as doors and operable windows

3.74
energy
capacity for doing work; having several forms that may be transformed from one to another, such as thermal (heat), mechanical (work), electrical or chemical

3.75
energy carrier
substance of phenomena that can be used to produce mechanical work or heat, or to operate chemical or physical processes

3.76
energy cost
cost of energy by unit and type of energy as proposed to be supplied to the building at the site including variations such as time of day, seasonal and rate of usage

3.77
energy cost budget
maximum allowable estimated annual energy expenditure for a proposed building

3.78
energy efficiency ratio
EER
ratio of net equipment (cooling or heating) capacity to total rate of electric input under designated operating conditions

NOTE When consistent units are used, this ratio becomes equal to COP.

See also **coefficient of performance** (3.35).

3.79
energy efficiency ratio for buildings
EERB
ratio of energy required (ER) and energy used (EU)

3.80
energy factor for water heater
EF
measure of the overall efficiency of a water heater

3.81
energy management system
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

3.82
energy need for heating or cooling
heat required for delivery to or extracted from a conditioned space by a heating or cooling system to maintain the intended temperature during a given period of time

3.83
energy need for domestic hot water
heat required for delivery to the domestic water to raise its temperature from the cold network temperature to the prefixed delivery temperature at the delivery point

3.84
energy performance of a building
calculated or measured amount of energy actually used or estimated to meet the different needs associated with a standard use of the building, which may include, *inter alia*, energy use for heating, cooling, ventilation, domestic hot water and lighting

3.85
energy, recovered
See **recovered energy** (3.193).

3.86
energy resource
energy taken from a source that is depleted by extraction (e.g. fossil fuels) and which is required to achieve the building performance and comfort over a given period of time including HVAC, lighting, occupancy, domestic hot water, etc.

3.87
energy use for space heating and cooling
energy input to the heating or cooling system to satisfy the energy need for heating or cooling, respectively

3.88
envelope performance factor
trade-off value for the building envelope performance compliance option calculated using the procedures specified in the systems performance trade-off

3.89
envelope performance factor, base
building envelope performance factor for the base design

3.90
envelope performance factor, proposed
building envelope performance factor for the proposed design

3.91
enthalpy
thermodynamic property of a substance defined as the sum of its thermodynamic energy plus the quantity PV, where P is the pressure, V is its volume

NOTE Formerly called total heat and heat content.

3.92
equipment
devices for comfort conditioning, electric power, lighting, transportation or service water heating, including, but not limited to, furnaces, boilers, air conditioners, heat pumps, chillers, water heaters, lamps, luminaries, ballasts, elevators, escalators, or other devices or installations

3.93
exfiltration
uncontrolled outward air leakage from inside a building, including leakage through cracks and interstices around windows and doors and through any other exterior partition or penetration

3.94
exterior building envelope
See **building envelope** (3.28).

3.95
exterior envelope
See **building envelope** (3.28).

3.96
exterior lighting power allowance
calculated maximum allowance of lighting power for an exterior area of a building or facility

NOTE The exterior lighting power allowance is expressed in units of watts.

3.97
external air
controlled air entering the system or opening from outdoors before any air treatment

3.98
facade area, vertical
area of the facade, including non-horizontal roof area, overhangs and cornices, measured in elevation in a vertical plane parallel to the plane of the face of the building

3.99
fan system energy demand
fan system power
sum of the nominal power demand (nameplate horsepower) of motors of all fans that are required to operate at design conditions, to supply air from the heating or cooling source to the conditioned space(s) and return it to the source or exhaust it to the outdoors

3.100
feeder conductor
wire that connects the service equipment to the branch circuit breaker panels

3.101
fenestration
any light-transmitting section in a building wall or roof, including glazing material (which may be glass or plastic), framing (mullions, muntins and dividers), external shading devices, internal shading devices and integral (between glasses) shading devices

3.102
fenestration, vertical
See **fenestration** (3.101).

3.103
fixture
component of a luminaire that houses the lamp or lamps, positions the lamp, shields it from view, and distributes the light

NOTE The fixture also provides for connection to the power supply, which can require the use of a ballast.

3.104
floor area, gross
floor area of heated or cooled spaces, excluding non-habitable cellars and unheated spaces, including the floor area on all stories if more than one

3.105
floor area, gross building envelope
gross floor area of the building envelope, but excluding slab-on-grade floors

3.106
floor area, gross conditioned
gross floor area of conditioned spaces

3.107
floor area, gross lighted
gross floor area of lighted spaces

3.108
general lighting
See **lighting**, general (3.140).

3.109
glazed wall system
category of site assembled fenestration products that includes, but is not limited to, curtain walls and solariums

3.110
gross exterior wall area
gross area of exterior walls separating a conditioned space from the outdoors or from unconditioned spaces as measured on the exterior above grade

NOTE The gross exterior wall area consists of the opaque wall (excluding vents and grills), including between floor spandrels, peripheral edges of flooring, window areas (including sash) and door areas.

3.111
gross floor area over outside unconditioned space
gross area of a floor assembly separating a conditioned space from the outdoors or from unconditioned spaces as measured from the exterior faces of exterior walls or from the centreline of walls separating buildings

NOTE The floor assembly shall be considered to include all floor components through which heat can flow between indoor and outdoor or unconditioned environments.

3.112
gross lighted area
sum of the total lighted areas of a building measured from the inside of the perimeter walls for each floor of the building

3.113
gross roof area
gross area of a roof assembly separating a conditioned space from the outdoors or from unconditioned spaces, measured from the exterior faces of exterior walls or from the centreline of walls separating buildings

NOTE The roof assembly shall be considered to include all roof or ceiling components though which heat can flow between indoor and outdoor environments including skylights but excluding service openings.

3.114
gross wall area
See **wall area, gross** (3.245).

3.115
gutter
space available for wiring inside panel boards and other electric panels

NOTE Also, a separate wire way used to supplement wiring spaces in electric panels.

3.116
HVAC system efficiency
See **efficiency, HVAC system** (3.69).

3.117
heat
form of energy that is transferred by virtue of a temperature difference or a change in state of a material

3.118
heated space
See **space** (3.217).

3.119
heating degree-day
See **degree-day** (3.58).

3.120
heating design temperature
outdoor dry-bulb temperature for sizing heating systems

3.121
heating seasonal performance factor
total heating output of a heat pump during its normal annual usage period for heating, divided by the total electric energy input during the same period

3.122
historic building
building or space that has been specifically designated as historically significant by the adopting authority

3.123
humidistat
automatic control device used to maintain humidity at a fixed or adjustable set point

3.124
heating, ventilating, air-conditioning system
equipment, distribution systems and terminals that provide, either collectively or individually, the processes of heating, ventilating or air conditioning to a building or portion of a building

3.125
luminance
density of the luminous flux incident on a surface

NOTE The luminance is the quotient of a luminous flux divided by the area of the surface when the latter is uniformly illuminated.

3.126
indirectly conditioned space
enclosed space within the building that is not a heated or cooled space, whose area-weighted heat transfer coefficient to heated or cooled spaces exceeds that to the outdoors or to unconditioned spaces; or through which air from heated or cooled spaces is transferred at a rate exceeding three air changes per hour

See also **heated space** (3.118), **cooled space** (3.46) and **unconditioned space** (3.111).

3.127
infiltration
uncontrolled inward air leakage through cracks and crevices in any building element and around windows and doors of a building caused by pressure differences across these elements due to factors such as wind, inside and outside temperature differences (stack effect), and imbalance between supply and exhaust air systems

3.128
installed interior lighting power
power of all permanently-installed general, task, and furniture lighting systems and luminaries as indicated on plans and specifications

NOTE The installed interior lighting power is expressed in units of watts.

3.129
integrated part-load value
single-number figure of merit based on part-load EER and COP expressing part-load efficiency for air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities for the equipment

3.130
interior lighting power allowance
See **lighting power allowance** (3.141).

3.130.1
interior unit lighting power allowance
⟨prescriptive⟩ allotted interior lighting power for each individual building type

NOTE The interior unit lighting power allowance is expressed in units of watts per square metre.

3.130.2
interior unit lighting power allowance
⟨system performance⟩ allotted interior lighting power for each individual space, area or activity in a building

NOTE The interior unit lighting power allowance is expressed in units of watts per square metre.

3.131
insolation
rate of solar energy incident on a unit area with a given orientation

3.132
isolation device
device that isolates HVAC zones so that they can be operated independently of one another

NOTE Isolation devices include, but are not limited to, separate systems, isolation dampers and controls providing shutoff at terminal boxes.

3.133
lamp
generic term for a man-made light source often called a bulb or tube

3.133.1
lamp
⟨compact fluorescent⟩ fluorescent lamp of a small compact shape, with a single base that provides the entire mechanical support function

3.133.2
lamp
⟨fluorescent⟩ low-pressure electric discharge lamp in which a phosphor coating transforms some of the ultraviolet energy generated by the discharge into light

3.133.3
lamp
⟨general service⟩ class of incandescent lamps that provide light in virtually all directions

EXAMPLES General service lamps are typically characterized by bulb shape such as A, standard; S, straight side; F, flame; G, globe; and PS, pear straight.

3.133.4
lamp
HID
⟨high-intensity discharge⟩ electric discharge lamp in which light is produced when an electric arc is discharged through a vaporized metal such as mercury or sodium

NOTE Some HID lamps can also have a phosphor coating which contributes to the light produced or enhances the light colour.

3.133.5
lamp
⟨incandescent⟩ lamp in which light is produced by a filament heated to incandescence by an electric current

3.133.6
lamp
⟨reflector⟩ class of incandescent lamps that have an internal reflector to direct the light

EXAMPLES Reflector lamps are typically characterized by reflective characteristics such as R, reflector; ER, ellipsoidal reflector; PAR, parabolic aluminized reflector; MR, mirrorized reflector; and others.

3.134
lamp/ballast efficacy
lumens produced by a lamp/ballast combination (the product of rated lamp lumen output and the relative light output of the lamp/ballast combination) divided by the watts of input power

NOTE The lamp/ballast efficacy is expressed in units of lumens per watt.

3.135
lamp efficacy
quotient of the total light, expressed in units of lumens emitted, and the total lamp power input, expressed in units of watts

NOTE The lamp efficacy is expressed in units of lumens per watt.

3.136
lamp lumens
⟨rated⟩ light output of a lamp as published in manufacturer's literature

3.137
lamp wattage
⟨rated⟩ power consumption of a lamp as published in manufacturer's literature

3.138
lighting
⟨decorative⟩ lighting that is purely ornamental and installed for aesthetic effect

NOTE Decorative lighting shall not include general lighting.

3.139
lighting efficacy
quotient of the total lumens emitted from a lamp or lamp/ballast combination divided by the watts of input power

NOTE The lighting efficacy is expressed in units of lumens per watt.

3.140
lighting
⟨general⟩ lighting that provides a substantially uniform level of illumination throughout an area

NOTE General lighting shall not include decorative lighting or lighting that provides a dissimilar level of illumination to serve a specialized application or feature within such area.

3.141
lighting power allowance
lighting allowance that includes the interior and exterior allowances as listed in 3.141.1 and 3.141.2

3.141.1
lighting power allowance, interior
maximum lighting power allowed for the interior of a building

NOTE The lighting power allowance, interior is expressed in units of watts.

3.141.2
lighting power allowance, exterior
maximum lighting power allowed for the exterior of a building

NOTE The lighting power allowance, exterior is expressed in units of watts.

3.142
lighting power budget
lighting power allowed for an interior or exterior area or activity

NOTE The lighting power budget is expressed in units of watts.

3.143
lighting power control credit
credit applied to that part of the connected lighting power of a space which is turned off or dimmed by automatic control devices

NOTE Lighting power control credit gives the specific value of lighting watts to subtract from the connected interior lighting power when establishing compliance with the interior lighting power allowance.

3.144
lighting power density
maximum lighting power per unit area of a building classification of space function

3.145
lighting system
group of luminaries circuited or controlled to perform a specific function

3.146
lumen
amount of light determined radiometrically from the radiant power

NOTE 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.

3.147
lumen maintenance control
device that senses the illumination level and causes an increase or decrease of illuminance to maintain a preset illumination level

3.148
luminaire
complete lighting unit consisting of a lamp or lamps together with the housing designed to distribute the light, position and protect the lamps, and connect the lamps to the power supply

3.149
manual
method of operation requiring personal intervention for control

3.150
marked rating
nameplate rating
design load operating conditions of a device as shown by the manufacturer on the nameplate or otherwise marked on the device

3.151
mean daily temperature
one half the sum of the minimum daily temperature and maximum daily temperature

3.152
mechanical heating
raising the temperature of a gas or liquid by use of fossil fuels burners, electric resistance heaters, heat pumps or other systems that require energy to operate

3.153
mechanical refrigeration
reducing the temperature of a gas or liquid by using vapour compression, absorption and desiccant dehumidification, combined with evaporative cooling or other energy-driven thermodynamic cycle

NOTE Indirect or direct evaporative cooling methods alone are not considered mechanical refrigeration.

3.154
metering electric
instruments that measure electric voltage, current, power, etc.

3.155
motor efficiency, minimum
minimum efficiency occurring in a population of motors of the same manufacturer and rating

3.156
motor efficiency, nominal
median efficiency occurring in a population of motors of the same manufacturer and rating

3.157
motor power ⟨rated⟩
rated output power from the motor

3.158
net thermal efficiency, generation
ratio between the heat or cooling demand of the distribution system and the fuel heat input energy requirements for heating or cooling; energy delivered to the heating or cooling system to satisfy the heat demand of the building

3.159
non-recirculating system
domestic or service hot water distribution system that is not a recirculating system

3.160
occupancy sensor
device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly

3.161
opaque
all areas in the building envelope, except fenestration and building service openings such as vents and grills See **building envelope** (3.28) and **fenestration** (3.101).

3.162
opaque areas
all exposed areas of a building envelope which enclose conditioned space except fenestration areas and building service openings such as vents and grilles

3.163
optimum start controls
controls that are designed to automatically adjust the start time of an HVAC system each day with the intention of bringing the space to desired occupied temperature levels immediately before scheduled occupancy

3.164
orientation
direction an envelope element faces, i.e. the direction of a vector perpendicular to and pointing away from the surface outside of the element

NOTE For vertical fenestration, the two categories are north-oriented and all other.

3.165
packaged terminal air conditioner
factory-selected wall sleeve and separate unencased combination of heating and cooling components, assemblies or sections

NOTE A packaged terminal air conditioner may include heating capability by hot water, steam or electricity and is intended for mounting through the wall to serve a single room or zone.

3.166
packaged terminal heat pump
packaged terminal air conditioner capable of using the refrigeration system in a reverse cycle or heat pump mode to provide heat

3.167
party wall
fire wall on an interior lot line used or adapted for joint service between two buildings

3.168
permanently installed
equipment that is fixed in place and is not portable or moveable

3.169
performance indicator
indicator calculated for the designed indoor environmental conditions and generally used to indicate how the building performs from the energy, carbon dioxide emissions and cost stand points

NOTE Systems can be identified as HVAC, DHW, lighting, automation and control systems.

EXAMPLES Different indicators are listed here after as illustrations, selections depends on the aim and objective of the project.

a) Energy demand of the building envelope:
   — Total energy demand [kWh]
   — Energy demand/floor unit [kWh/m^2]

b) Integrated performance including systems:
   — Total energy used [kWh]
   — Integrated intensity of energy used = 2a/floor unit [kWh/m^2]
   — Building (active) efficiency = Energy demand/energy used [—]

c) Primary (weighted) energy performance:
   — Same as 2 but multiply energy used from any energy carrier with weighted primary coefficient

d) CO_2 emission:
   — Total CO_2 emission per year [g]
   — Relative CO_2 emission 4b = 4a/floor unit [g/m^2]

e) Cost efficiency:
   — Design cost per total energy cost and floor unit
   — Design cost per floor unit
   — Design cost per total energy used

f) Definition of design cost:
- Investment costs
- Global economics including annual costs
- Cost related to design life time of the building including any operational costs (LCC)

3.170
piping
system for conveying fluids including pipes, valves, strainers and fittings

3.171
plenum
enclosure that is part of the air distribution system and is distinguished by having almost uniform air pressure

NOTE A plenum often is formed in part or in total by portions of the building.

3.172
power

3.172.1
power
⟨machines⟩ the time rate of doing work

3.172.2
power
⟨transmission of energy of all types⟩ rate at which energy is transmitted

NOTE Power is measured in units of watts.

3.173
power adjustment factor
modifying factor that adjusts the effective connected lighting power (CLP) of a space to account for the use of energy conserving lighting control devices

3.174
power factor
ratio of total real power in watts to the apparent power

NOTE The power factor is expressed in units of root-mean-square volt amperes.

3.175
prescribed assumption
fixed value of an input to the standard calculation procedure

3.176
primary air system
central air moving heating and cooling equipment that serves multiple zones through mixing boxes, VAV boxes or reheat coils

3.177
primary energy
energy that has not been subjected to any conversion or transformation process

NOTE 1 Primary energy can be either resource energy or renewable energy or a combination of both.

NOTE 2 For a building, it is the energy used to produce the energy delivered to the building; it is calculated from the delivered amounts of energy carriers using conversion factors.

3.178
primary energy efficiency
ratio between the energy required and the primary energy requirements to assume for the energy used

3.179
process energy
energy consumed in support of a manufacturing, industrial or commercial process other than conditioning spaces and maintaining comfort and amenities for the occupants of a building

3.180
process load
load on a building resulting from the consumption or release of process energy

3.181
projection factor
ratio of the horizontal depth of the external shading projection divided by the sum of the height of the fenestration and the distance from the top of the fenestration to the bottom of the farthest point of the external shading projection, in consistent units

See Figure 3.

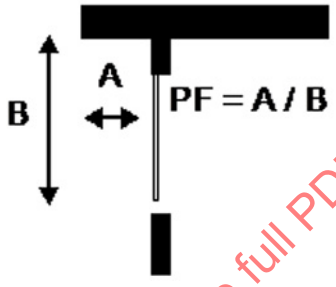


Figure 3 — Projection factor

NOTE Projection factor is a term to indicate how much shading an overhang provides for vertical fenestration.

EXAMPLE If a 1,8 m horizontal overhang is placed right at the top of a 3 m store window, the projection factor would be 1,8/(3,0 + 0) = 0,60. However, if the horizontal overhang is located 0,6 m above the window, then the projection factor would be 1,8/(3,0 + 0,6) = 0,50).

3.182
proposed design
computer representation of the actual proposed building design or portion thereof that incorporates standard requirements

NOTE This representation is used as the basis for calculating the design energy cost.

3.183
prototype building
generic building design of the same size and occupancy type as the proposed design that complies with the prescriptive requirements of this International Standard and has prescribed assumptions used to generate the energy budget concerning shape, orientation, HVAC and other system designs

3.184
pump system energy demand
pump system power
sum of the nominal power demand (nameplate horsepower at nominal motor efficiency) of motors of all pumps that are required to operate at design conditions to supply fluid from the heating or cooling source to all heat transfer devices (e.g. coils, heat exchanger) and return it to the source

3.185
radiant comfort heating
system in which temperatures of room surfaces are adjusted to control the rate of heat loss by radiation from occupants

3.186
radiant heating system
heating system that transfers heat to objects and surfaces within the heated space primarily (greater than 50 %) by infrared radiation

3.187
rated lamp lumens
See **lamp lumens**, rated (3.136).

3.188
rated lamp wattage
See **lamp wattage**, rated (3.137).

3.189
rated motor power
See **motor power**, rated (3.157).

3.190
readily accessible
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, etc.

NOTE In public facilities, accessibility may be limited to certified personnel through locking covers or by placing equipment in locked rooms.

3.191
recirculating system
domestic or service hot water distribution system that includes a closed circulation circuit designed to maintain usage temperatures in hot water pipes near terminal devices (e.g. lavatory faucets, shower heads) in order to reduce the time required to obtain hot water when the terminal device valve is opened

NOTE The motive force for circulation is either natural (due to water density variations with temperature) or mechanical (recirculation pump).

3.192
recooling
lowering the temperature of air that has been previously heated by a mechanical heating system

3.193
recovered energy
part of the **recoverable energy** (3.194)

NOTE Energy utilized from an energy utilization system which would otherwise be wasted (not contributing to a desired end use). Recovered energy can contribute to reduce the energy required (ER).

3.194
recoverable energy
part of the energy normally lost from the space, domestic hot water system or domestic lighting that can be recovered to lower the energy required

3.195
reference building
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

3.196
reflectance
ratio of the light reflected by a surface to the light incident upon it

3.197
reheating
raising the temperature of air that has been previously cooled either by mechanical refrigeration or an economizer system

3.198
reset
automatic adjustment of the controller set point to a higher or lower value

3.199
roof area, gross
area of the roof measured from the exterior faces of walls or from the centreline of party walls

3.200
room air conditioner
encased assembly mounted in a window or through a wall or as a console, designed primarily to provide direct delivery of conditioned air to an enclosed space, room or zone

NOTE The room air conditioner includes a prime source of refrigeration for cooling and dehumidification and a means for circulating and cleaning air. It may also include a means for ventilating and heating.

3.201
room area
〈lighting power determination〉 the area of a room or space determined from the inside face of the walls or partitions measured at work plane height

3.202
room cavity ratio
RCR
factor that characterizes room configuration as a ratio between the walls and ceiling and is based upon room dimensions

3.203
sash crack
sum of all perimeters of all ventilators, sash or doors based on overall dimensions of such parts expressed in feet (counting two adjacent lengths of perimeter as one)

3.204
sequence
consecutive series of operations

3.205
service systems
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)

3.206
service water heating
heating water for domestic or commercial purposes other than space heating and process requirements

3.207
service water heating demand
maximum design rate of water withdrawal from a service water heating system in a designated period of time (usually an hour or a day)

3.208
setback
reduction of heating (by reducing the set point) or cooling (by increasing the set point) during hours when a building is unoccupied or during periods when lesser demand is acceptable

3.209
set-point temperature
internal (minimum) temperature, as fixed by the control system in normal heating mode; or internal (maximum) temperature, as fixed by the control system in normal cooling mode

3.210
shell building
building for which the envelope is designed, constructed or both prior to knowing the occupancy type

3.211
single-zone system
system that provides heating and/or cooling to a single space or a group of spaces that have thermal load requirements sufficiently similar that desired conditions can be maintained throughout by a single temperature control device

3.212
site-recovered energy
waste energy recovered at the building site that is used to offset consumption of purchased fuel or electrical energy supplies

3.213
site-solar energy
thermal, chemical or electrical energy derived from direct conversion of incident solar radiation at the building site and used to offset consumption of purchased fuel or electrical energy supplies

NOTE For the purposes of applying this International Standard, site-solar energy shall not include passive heat gain through fenestration systems.

3.214
slab-on-grade floor
that portion of a slab floor of the building envelope that is in contact with the ground and that is either above grade or is less than or equal to 600 mm below the final elevation of the nearest exterior grade

3.214.1
heated slab-on-grade floor
slab-on-grade floor with a heating source either within or below it

3.214.2
unheated slab-on-grade floor
slab-on-grade floor that is not a heated slab-on-grade floor

3.215
solar energy source
source of thermal, chemical or electrical energy derived from direct conversion of incident solar radiation at the building site

3.216
solar heat gain coefficient
SHGC
ratio of the solar heat gain entering the space through the fenestration area to the incident solar radiation

NOTE Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted or convected into the space.

3.217
space
enclosed space within a building