

Extract from the actual CEN Umbrella Dokument (Draft)

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Explanation of the general relationship between various CEN standards and the Energy Performance of Buildings Directive (EPBD) ("Umbrella Document")

ICS:

Descriptors:

Version 6, June 2005

This document provides an overview of the calculation procedure, as a whole and in its constituent parts, for assessing the energy performance of buildings. It includes a list of the European standards, both existing and new standards, which together form the calculation methodology.

It will be updated as the drafting work proceeds to reflect the contents of the standards, and to take account of comments.

When the standards are finalised, this document will be published as a CEN Technical Report.

This version of the document incorporates comments made on version 5.

Annex A

Standards arranged by hierarchy

Man date refer ence	Title of standard	Stage – Dec. 2005	Respon- sible TC	EN no.	Comment
Section 1 : Standards concerned with calculation of overall energy use in buildings (based on results from standards in section 2)					
1+3	Energy performance of buildings – Methods for expressing energy performance and for energy certification of buildings	46	TC 89	prEN 15217	
2	Energy performance of buildings – Overall energy use, primary energy and CO ₂ emissions	41	TC 228	prEN 15315	15315 and 15203 to be merged
4	Energy performance of buildings – Assessment of energy use and definition of ratings	46	TC 89	prEN 15203	15315 and 15203 to be merged
29	Data requirements for standard economic evaluation procedures related to energy systems in buildings, including renewable energy sources.	40	TC 228	prEN 15429	
Section 2 : Standards concerned with calculation of delivered energy (based where relevant on results from standards in section 3)					
7	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 1: General	41	TC 228	prEN 15316-1	
8	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 2-1: Space heating emission systems	41	TC 228	prEN 15316-2-1	
9	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies: Part 4-1: Space heating generation – Combustion systems Part 4-2: Space heating generation – Heat pump systems	41	TC 228	prEN 15316-4	

Man date refer ence	Title of standard	Stage – Dec. 2005	Respon- sible TC	EN no.	Comment
	Part 4-3: Thermal solar systems Part 4-4: Performance and quality of CHP electricity and heat Part 4-5: Performance and quality of district heating and large volume systems Part 4-6: Performance of other renewables (heat and electricity) Part 4-7: Space heating generation – Biomass combustion systems				
10	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 2-3: Space heating distribution systems	41	TC 228	prEN 15316-2-3	
11	Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 3-1: Domestic hot water systems, characterisation of needs (tapping patterns) Part 3-2: Domestic hot water systems, distribution Part 3-3: Domestic hot water systems, generation	41	TC 228	prEN 15316-3	
12	Calculation of room temperatures and of load and energy for buildings with room conditioning systems	41	TC 156	prEN 15243	
26	Design of embedded water based surface heating and cooling systems Part 1: Determination of the design heating and cooling capacity Part 2: Design, dimensioning and installation Part 3: Optimising for use of renewable energy sources	41	TC 228	prEN 15377	
20+ 21	Ventilation for buildings – Calculation methods for energy losses due to ventilation and infiltration in commercial buildings	46	TC 156	prEN 15241	
22	Calculation methods for energy efficiency improvements by the application of integrated building automation systems	46	TC 247	prEN 15232	
13	Energy performance of buildings – Energy requirements for lighting	46	TC 169	prEN 15193	

Man date refer ence	Title of standard	Stage – Dec. 2005	Respon- sible TC	EN no.	Comment
Section 3 : Standards concerned with calculation of net energy for heating and cooling					
15	Thermal performance of buildings – Calculation of energy use for space heating	64	TC 89	EN ISO 13790:2004	
14	Energy performance of buildings – Calculation of energy use for space heating and cooling	46	TC 89	prEN ISO 13790	Revision of EN ISO 13790:2004
16	Thermal performance of buildings – Sensible room cooling load calculation – General criteria and validation procedures	46	TC 89	prEN 15255	
17	Energy performance of buildings – Calculation of energy use for space heating and cooling – General criteria and validation procedures	41	TC 89	prEN 15265	
Section 4 : Standards to support the above					
4A : Thermal performance of building components					
23	Thermal performance of buildings – Transmission and ventilation heat transfer coefficients – Calculation method	46	TC 89	prEN ISO 13789	Revision of EN ISO 13789:1999
23	Thermal performance of building components – Dynamic thermal characteristics – Calculation methods	46	TC 89	prEN ISO 13786	Revision of EN ISO 13786:1999
24	Building components and building elements – Thermal resistance and thermal transmittance – Calculation method	46	TC 89	prEN ISO 6946	Revision of EN ISO 6946:1996
24	Thermal performance of buildings – Heat transfer via the ground – Calculation methods	46	TC 89	prEN ISO 13370	Revision of EN ISO 13370:1998
-	Thermal performance of curtain walling – Calculation of thermal transmittance – Simplified method	46	TC 89	prEN 13947	
23	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General	46	TC 89	prEN ISO 10077-1	Revision of EN ISO 10077-1:2000

Man date refer ence	Title of standard	Stage – Dec. 2005	Respon- sible TC	EN no.	Comment
-	Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames	64	TC 89	EN ISO 10077-2:2003	
24	Thermal bridges in building construction – Heat flows and surface temperatures – Detailed calculations	46	TC 89	prEN ISO 10211	Revision of EN ISO 10211-1:1995 and EN ISO 10211-2:2001
24	Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values	46	TC 89	prEN ISO 14683	Revision of EN ISO 14683:1999
24	Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values	46	TC 89	prEN ISO 10456	Revision of EN ISO 10456:2000 incorporating EN 12524:2000
4B : Ventilation and air infiltration					
18	Ventilation for buildings – Calculation methods for the determination of air flow rates in dwellings including infiltration	64	TC 156	EN 13465:2004	
19	Ventilation for buildings – Calculation methods for the determination of air flow rates in buildings including infiltration	46	TC 156	prEN 15242	Covers all buildings, will supersede EN 13465
25	Ventilation for non residential buildings – Performance requirements for ventilation and room conditioning systems.	46	TC 156	prEN 13779	Revision of EN 13779:2004
4C : Overheating and solar protection					
27	Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – General criteria and validation procedures	64	TC 89	EN ISO 13791:2004	
28	Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – Simplified methods	64	TC 89	EN ISO 13792:2005	

Man date reference	Title of standard	Stage – Dec. 2005	Responsible TC	EN no.	Comment
-	Solar protection devices combined with glazing – Calculation of solar and light transmittance – Part 1: Simplified method	64	TC 89	EN 13363-1:2003	
-	Solar protection devices combined with glazing – Calculation of solar and light transmittance – Part 2: Detailed calculation method	52	TC 89	prEN 13363-2	
4D : Indoor conditions and external climate					
-	Design criteria and the indoor environment	64	TC 156	CR 1752:1999	
31	Criteria for the indoor environment, including thermal, indoor air quality (ventilation), light and noise	46	TC 156	prEN 15251	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 1: Monthly and annual means of single meteorological elements	64	TC 89	EN ISO 15927-1:2003	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 2: Hourly data for design cooling load	40	TC 89	prEN ISO 15927-2	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 3: Calculation of a driving rain index for vertical surfaces from hourly wind and rain data	46	TC 89	prEN ISO 15927-3	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 4: Hourly data for assessing the annual energy for heating and cooling	64	TC 89	EN ISO 15927-4:2005	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 5: Data for design heat load for space heating	64	TC 89	EN ISO 15927-5:2005	
-	Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 6: Accumulated temperature differences (degree days)	46	TC 89	prEN ISO 15927-6	

Man date reference	Title of standard	Stage – Dec. 2005	Responsible TC	EN no.	Comment
4E : Definitions and terminology					
-	Thermal insulation – Physical quantities and definitions	64	TC 89	EN ISO 7345:1996	
-	Thermal insulation – Heat transfer by radiation – Physical quantities and definitions	64	TC 89	EN ISO 9288:1996	
-	Thermal insulation – Heat transfer conditions and properties of materials – Vocabulary	64	TC 89	EN ISO 9251:1996	
-	Ventilation for buildings – Symbols, terminology and graphical symbols	64	TC 156	EN 12792:2003	
Section 5 : Standards concerned with monitoring and verification of energy performance					
-	Ventilation for buildings – Test procedures and measuring methods for handing over installed ventilation and air conditioning systems	64	TC 156	EN 12599:2000	Deals with the setting to work /commissioning of new ventilation/ air conditioning systems in non dwellings. It provides a starting point for on going monitoring of the building
-	Thermal performance of buildings – Determination of air permeability of buildings – Fan pressurization method	64	TC 89	EN 13829:2001	Method to verify energy performance of buildings
-	Thermal performance of buildings – Determination of air change in buildings – Tracer gas dilution method	64	TC 89	EN ISO 12569:2001	Method to verify energy performance of buildings
-	Thermal performance of buildings – Qualitative detection of thermal irregularities in building envelopes – Infrared method	64	TC 89	EN 13187:1999	Method to verify energy performance of buildings
5	Heating systems in buildings – Inspection of boilers and heating systems	40	TC 228	prEN 15378	
30	Ventilation for buildings – Energy performance of buildings – Guidelines for the inspection of ventilation systems	41	TC 156	prEN 15239	

Man date reference	Title of standard	Stage – Dec. 2005	Responsible TC	EN no.	Comment
6	Ventilation for buildings – Energy performance of buildings – Guidelines for the inspection of air-conditioning systems	41	TC 156	prEN 15240	

Annex B

Summarised content of standards, arranged by standard number

There are two tables: EN standards and EN ISO standards.

B.1 EN standards

EN	Title and Content
CR 1752	<p>Design criteria and the indoor environment</p> <p>CONTENT: Specifies the requirements for, and the methods for expressing the quality of the indoor environment for the design, commissioning, operation and control of ventilation and air-conditioning systems. Covers indoor environments where the major concern is the human occupation, but excludes dwellings and buildings where industrial processes or similar operations requiring special conditions are undertaken.</p>
EN 12599	<p>Ventilation for buildings – Test procedures and measuring methods for handing over installed ventilation and air conditioning systems</p> <p>CONTENT: Specifies checks, test methods and measuring instruments in order to verify the fitness for purpose of the installed systems at the stage of handing over. Offers choice between simple test methods and extensive measurements.</p> <p>Applies to mechanically operated ventilation and air conditioning systems as specified in EN 12792 and comprising any of the following:</p> <ul style="list-style-type: none"> – Air terminal devices and units – Air handling units – Air distribution systems (supply, extract, exhaust) – Fire protection devices – Automatic control devices. <p>Does not define the procedure by which the system is set, adjusted and balanced, or the procedure for internal quality control checks before handing over.</p>
EN 12792	<p>Ventilation for buildings – Symbols, terminology and graphical symbols</p> <p>CONTENT: Comprises the symbols and terminology included in the European standards covering 'Ventilation for buildings' produced by CEN/TC 156.</p>
EN 13187	<p>Thermal performance of buildings – Qualitative detection of thermal irregularities in building envelopes – Infrared method</p> <p>CONTENT: Specifies a qualitative method, by thermographic examination, for detecting thermal irregularities in building envelopes. The method is used initially to identify wide variations in thermal properties, including air tightness, of the components constituting the external envelopes of buildings. The results have to be interpreted and assessed by persons who are specially trained for this purpose.</p>
EN 13363-1	<p>Solar protection devices combined with glazing – Calculation of solar and light transmittance - Part 1: Simplified method</p> <p>CONTENT: Specifies a simplified method based on the thermal transmittance and total solar energy transmittance of the glazing and on the light transmittance and reflectance of the solar protection device to estimate the total solar energy transmittance of a solar protection device combined with glazing. Applicable to all types of solar protection devices parallel to the glazing. Venetian or louvre blinds are assumed to be adjusted so that there is no direct solar penetration.</p>

EN	Title and Content
EN 13363-2	<p>Solar protection devices combined with glazing – Calculation of solar and light transmittance - Part 2: Detailed calculation method</p> <p>CONTENT: Specifies a detailed method, based on the spectral transmission data of the materials, comprising the solar protection devices and the glazing, to determine the total solar energy transmittance and other relevant solar-optical data of the combination. Valid for all types of solar protection devices parallel to the glazing. Ventilation of the blind is allowed for in each of these positions in determining the solar energy absorbed by the glazing or blind components, for vertical orientation of the glazing.</p>
EN 13465	<p>Ventilation for buildings – Calculation methods for the determination of air flow rates in dwellings</p> <p>CONTENT: Specifies methods to calculate air flow rates for single family houses and individual apartments up to the size of approximately 1000 m². Covers natural, mechanical extract and balanced ventilation systems. Flows due to window opening are also considered, but only as a single sided effect (i.e. no cross ventilation).</p>
prEN 13779 rev	<p>Ventilation for non residential buildings - Performance requirements for ventilation and room-conditioning systems</p> <p>CONTENT: Gives performance requirements for ventilation systems. Applies to the design of ventilation and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. (Applications for residential ventilation are dealt with in prEN 14788).</p>
EN 13829	<p>Thermal performance of buildings – Determination of air permeability of buildings – Fan pressurization method (ISO 9972:1996, modified)</p> <p>CONTENT: Measurement of the air permeability of buildings or parts of buildings in the field. It specifies the use of mechanical pressurization or depressurization of a building or part of a building. It describes the measurement of the resulting air flow rates over a range of indoor-outdoor static pressure differences.</p>
prEN 13947	<p>Thermal performance of curtain walling – Calculation of thermal transmittance</p> <p>CONTENT: Methods for calculating the thermal transmittance of curtain walls consisting of glazed and/or opaque panels fitted in, or connected to, frames. Detailed and simplified methods. Includes different types of glazing, frames of any material, different types of opaque panels clad with metal, glass, ceramics or any other material, thermal bridge effects at the rebate or joint between the glazed area, the frame area and the panel area.</p>
prEN 15193	<p>Energy performance of buildings - Energy requirements for lighting</p> <p>CONTENT: Specifies the calculation methodology for the evaluation of the amount of energy used for lighting in the building and provides the numeric indicator for lighting energy requirements used for certification purposes. Also provides a methodology for the calculation of dynamic lighting energy use for the estimation of the total energy performance of the building.</p>
prEN 15203	<p>Energy performance of buildings - Assessment of energy use and definition of ratings</p> <p>CONTENT: Defines the uses of energy to be taken into account for setting energy performance ratings for new and existing buildings, and provides:</p> <ul style="list-style-type: none"> a) A method to compute the asset rating, a standard energy use that does not depend on occupant behaviour, actual weather and other actual (environment or input) conditions. b) A method to assess the operational rating, based on the delivered energy. c) A methodology to improve confidence in the building calculation model by comparison with actual energy consumption. d) A method to assess the energy effectiveness of possible improvements.
prEN 15217	<p>Energy performance of buildings - Methods for expressing energy performance and for energy certification of buildings</p> <p>CONTENT: Defines:</p> <ul style="list-style-type: none"> a) Global indicators to express the energy performance of whole buildings, including heating, ventilation, air conditioning, domestic hot water and lighting systems. This includes the different possible indicators as well as a method to normalize them b) Ways to express energy requirements for the design of new buildings or renovation of

EN	Title and Content
	<p>existing buildings</p> <p>c) Procedures to define reference values and benchmark</p> <p>d) Ways to design energy certification schemes</p>
prEN 15232	<p>Calculation methods for energy efficiency improvements by the application of integrated building automation systems</p> <p>CONTENT: Defines and specifies the performance of standardised energy saving and optimisation functions and routines of Building Automation and Control Systems (BACS) and Technical Building Management (TBM) systems and services. Summarises the methodologies to calculate/estimate the energy demand for heating, ventilation, cooling, hot water and lighting of buildings and expresses the results of energy saving and efficiency in buildings by the application of the different BACS energy saving functions.</p>
prEN 15239	<p>Ventilation for buildings - Energy performance of buildings - Guidelines for inspection of ventilation systems</p> <p>CONTENT: Gives methodology for the inspection of mechanical and natural ventilation systems in relation to its energy consumption. Applicable to all buildings. Purpose is to assess functioning and impact on energy consumption. Includes recommendations on possible system improvements.</p>
prEN 15240	<p>Ventilation for buildings - Energy performance of buildings - Guidelines for inspection of air-conditioning systems</p> <p>CONTENT: Describes the common methodology for inspection of air conditioning systems in buildings for space cooling and or heating from an energy consumption standpoint. The purpose is to assess the energy performance and proper sizing of the system, including: conformity to the original and subsequent design modifications, actual requirements and the present state of the building; correct system functioning; function and settings of various controls; function and fitting of the various components; power input and the resulting energy output.</p>
prEN 15241	<p>Ventilation for buildings - Calculation methods for energy losses due to ventilation and infiltration in commercial buildings</p> <p>CONTENT: Describes method to calculate the energy impact of ventilation systems (including airing) in buildings to be used for applications such as energy calculations, heat and cooling load calculation. Its purpose is to define how to calculate the characteristics (temperature, humidity) of the air entering the building, and the corresponding energy required for its treatment as the auxiliary electrical energy required.</p>
prEN 15242	<p>Ventilation for buildings - Calculation methods for the determination of air flow rates in buildings including infiltration</p> <p>CONTENT: Describes method to calculate the ventilation air flow rates for buildings to be used for applications such as energy calculations, heat and cooling load calculation, summer comfort and indoor air quality evaluation. Applies to mechanically ventilated buildings; passive ducts; hybrid systems switching between mechanical and natural modes; window opening by manual operation for airing or summer comfort issues.</p>
prEN 15243	<p>Ventilation for buildings - Calculation of room temperatures and of load and energy for buildings with room conditioning systems</p> <p>CONTENT: Defines procedures to calculate temperatures, sensible loads and energy demands for rooms; latent room cooling and heating load, the building heating, cooling, humidification and dehumidification loads and the system heating, cooling, humidification and dehumidification loads.</p> <p>Gives general hourly calculation method, and simplified methods.</p>

EN	Title and Content
prEN 15251	<p>Criteria for the indoor environment including thermal, indoor air quality, light and noise</p> <p>CONTENT: Specifies the parameters of impact and/or criteria for indoor environment and how to establish indoor environmental input parameters for the building system design and energy performance calculations. Also specifies methods for long term evaluation of the obtained indoor environment as a result of calculations or measurements. Applicable mainly in the non-industrial buildings where the criteria for indoor environment are set by human occupancy and where the production or process does not have a major impact on indoor environment..</p>
prEN 15255	<p>Thermal performance of buildings - Sensible room cooling load calculation - General criteria and validation procedures</p> <p>CONTENT: Sets out the level of input and output data, and prescribes the boundary conditions required for a calculation method of the sensible cooling load of a single room under constant or/and floating temperature taking into account the limit of the peak cooling load of the system. It includes a classification scheme of the calculation method and the criteria to be met by a calculation method in order to comply with this standard. Purpose is to validate calculation methods used to evaluate the maximum cooling load for equipment selection and HVAC system design; evaluate the temperature profile when the cooling capacity of the system is reduced; provide data for evaluation of the optimum possibilities for load reduction; allow analysis of partial loads as required for system design, operation and control.</p>
prEN 15265	<p>Thermal performance of buildings – Calculation of energy use for space heating and cooling – General criteria and validation procedures</p> <p>CONTENT: Specifies the assumptions, boundary conditions and validation tests for a calculation procedure for the annual energy use for space heating and cooling of a building (or of a part of it) where the calculations are done on an hourly basis. Does not impose any specific numerical technique. Purpose of this standard is to validate calculation methods used to describe the energy performance of each room of a building; provide energy data to be used as interface with system performance analysis (HVAC, lighting, domestic hot water, etc).</p>
prEN 15315	<p>Heating systems in buildings - Energy performance of buildings - Overall energy use and primary energy and CO₂ emissions</p> <p>CONTENT: Collates results from other standards that specify calculation of energy consumption within a building; accounts for energy generated in the building, some of which may be exported for use elsewhere; presents summary in tabular form of the overall energy use of the building. Specifies calculation of primary energy consumption and carbon dioxide emission for the building as a whole; gives general principles for the calculation of primary energy factors and carbon dioxide emission factors.</p>
prEN 15316-1	<p>Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 1: General</p> <p>CONTENT: Standardises the required inputs, the outputs and the structure of the calculation method for system energy requirements. Energy performance may be assessed either by values of the system efficiencies or by values of the system losses due to inefficiencies. Based on an analysis of the following parts of a space heating and domestic hot water system:</p> <ul style="list-style-type: none"> - the emission system energy performance including control; - the distribution system energy performance including control; - the storage system energy performance including control; - the generation system energy performance including control (e.g. boilers, solar panels, heat pumps, cogeneration units).

EN	Title and Content
prEN 15316-2-1	<p>Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2-1: Space heating emission systems</p> <p>CONTENT: Energy performance may be assessed either by values of the heat emission system performance factor or by values of the heat emission system losses due to inefficiencies. Method is based on an analysis of the following characteristics of a space heat emission system including control:</p> <ul style="list-style-type: none"> - non-uniform space temperature distribution; - emitters embedded in the building structure; - control of the indoor temperature.
prEN 15316-2-3	<p>Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2-3: Space heating distribution systems</p> <p>CONTENT: Provides a methodology to calculate/estimate the heat emission of water based distribution systems for heating and the auxiliary demand as well as the recoverable heat emission and auxiliary demand.</p>
prEN 15316-3	<p>Heating systems in buildings – Method for calculation of system energy requirements and system efficiencies – Part 3: Domestic hot water systems</p> <p>CONTENT: Calculation of energy requirements for domestic hot water heating systems including control, for all building types. In three parts:</p> <ul style="list-style-type: none"> Part 3-1 Characterisation of needs (tapping patterns) Part 3-2 Distribution Part 3-3 Storage and generation
prEN 15316-4	<p>Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 4: Space heating generation systems</p> <p>CONTENT: Provides methods for system efficiencies and/or losses and auxiliary energy. Consists of seven parts:</p> <ul style="list-style-type: none"> Part 4-1 Boilers Part 4-2 Heat pumps Part 4 Thermal solar systems Part 4-4 Co-generation (micro-CHP) systems Part 4-5 District heating and large volume systems Part 4-6 Photovoltaics Part 4-7 Biomass combustion systems
prEN 15377	<p>Design of embedded water based surface heating and cooling systems</p> <p>CONTENT: Applies to water based surface heating and cooling systems in residential, commercial and industrial buildings, for systems integrated into the wall, floor or ceiling construction without any open air gaps. In three parts:</p> <ul style="list-style-type: none"> Part 1: Determination of the design heating and cooling capacity Part 2: Design, dimensioning and installation Part 3: Optimising for the use of renewable energy sources
prEN 15378	<p>Heating systems in buildings — Inspection of boilers and heating systems</p> <p>CONTENT: Specifies inspection procedures and optional measurement methods for the assessment of energy performance of existing boilers and heating systems. Includes boilers for heating, domestic hot water or both; and boilers fired by gas, liquid or solid fuel (including biomass). Also includes heat distribution network, including associated components and controls; heat emitters, including accessories; and space heating control system.</p>
prEN 15429	<p>Data requirements for standard economic evaluation procedures related to energy systems in buildings, including renewable energy sources</p> <p>CONTENT: Provides data and calculation methods for economic issues of heating systems and other systems that are involved in the energy demand and consumption of the building.</p>

B.2 EN ISO standards

EN ISO	Title and Content
prEN ISO 6946	<p>Building components and building elements – Thermal resistance and thermal transmittance – Calculation method</p> <p>CONTENT: Method of calculation of the thermal resistance and thermal transmittance of building components and building elements, excluding doors, windows and other glazed units, components which involve heat transfer to the ground, and components through which air is designed to permeate.</p>
EN ISO 7345	<p>Thermal insulation – Physical quantities and definitions</p> <p>CONTENT: Defines physical quantities used in the field of thermal insulation, and gives the corresponding symbols and units.</p>
EN ISO 9288	<p>Thermal insulation – Heat transfer by radiation – Physical quantities and definitions</p> <p>CONTENT: Defines physical quantities and other terms in the field of thermal insulation relating to heat transfer by radiation.</p>
EN ISO 9251	<p>Thermal insulation – Heat transfer conditions and properties of materials – Vocabulary</p> <p>CONTENT: Defines terms used in the field of thermal insulation to describe heat transfer conditions and properties of materials.</p>
prEN ISO 10077-1	<p>Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 1: General</p> <p>— CONTENT: Specifies methods for the calculation of the thermal transmittance of windows and pedestrian doors consisting of glazed and/or opaque panels fitted in a frame, with and without shutters. Allows for different types of glazing, opaque panels, various types of frames, and where appropriate the additional thermal resistance for closed shutters.</p>
EN ISO 10077-2	<p>Thermal performance of windows, doors and shutters – Calculation of thermal transmittance – Part 2: Numerical method for frames</p> <p>CONTENT: Specifies a method and gives the material data required for the calculation of the thermal transmittance of vertical frame profiles, and the linear thermal transmittance. Can also be used to evaluate the thermal resistance of shutter profiles and the thermal characteristics of roller shutter boxes.</p>
prEN ISO 10211	<p>Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations</p> <p>CONTENT: Sets out the specifications for a 3-D and 2-D geometrical model of a thermal bridge for the numerical calculation of heat flows and surface temperatures. Specifications include the geometrical boundaries and subdivisions of the model, the thermal boundary conditions and the thermal values and relationships to be used.</p>
prEN ISO 10456	<p>Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values</p> <p>CONTENT: This standard specifies methods for the determination of declared and design thermal values for thermally homogeneous building materials and products, together with procedures to convert values obtained under one set of conditions to those valid for another set of conditions. These procedures are valid for design ambient temperatures between -30 °C and +60 °C.</p> <p>It gives conversion coefficients for temperature and for moisture. These coefficients are valid for mean temperatures between 0 °C and 30 °C.</p> <p>It also gives design data in tabular form for use in heat and moisture transfer calculations, for thermally homogeneous materials and products commonly used in building construction.</p>

EN ISO	Title and Content
EN ISO 12569	<p>Thermal performance of buildings – Determination of air change in buildings – Tracer gas dilution method (ISO 12569:2000)</p> <p>CONTENT: Describes the use of tracer gas dilution for determining the air change in a single zone as induced by weather conditions or mechanical ventilation. Includes concentration decay, constant injection and constant concentration.</p>
prEN ISO 13370	<p>Thermal performance of buildings – Heat transfer via the ground – Calculation methods</p> <p>CONTENT: Gives methods of calculation of heat transfer coefficients and heat flow rates, for building elements in thermal contact with the ground, including slab-on-ground floors, suspended floors and basements. It applies to building elements, or parts of them, below a horizontal plane in the bounding walls of the building. Includes calculation of the steady-state part of the heat transfer (the annual average rate of heat flow), and the part due to annual periodic variations in temperature (the seasonal variations of the heat flow rate about the annual average).</p>
prEN ISO 13786	<p>Thermal performance of building components – Dynamic thermal characteristics – Calculation methods</p> <p>CONTENT: Specifies the characteristics related to dynamic thermal behaviour of building components and gives methods for their calculation.</p>
prEN ISO 13789	<p>Thermal performance of buildings - Transmission and ventilation heat transfer coefficients - Calculation method</p> <p>CONTENT: Specifies method and provides conventions for the calculation of the steady-state transmission and ventilation heat transfer coefficients of whole buildings and parts of buildings. Applicable both to heat loss (internal temperature higher than external temperature) and to heat gain (internal temperature lower than external temperature).</p>
prEN ISO 13790	<p>Thermal performance of buildings - Calculation of energy use for space heating and cooling</p> <p>CONTENT: Gives calculation methods for assessment of the annual energy use for space heating and cooling of a residential or a non-residential building, or a part of it. Includes the calculation of heat transfer by transmission and ventilation of the building when heated or cooled to constant internal temperature; the contribution of internal and solar heat sources to the building heat balance; the annual energy needs for heating and cooling; the annual energy required by the heating and cooling systems of the building for space heating and cooling; the additional annual energy required by a ventilation system. Building can have several zones with different set-point temperatures, and can have intermittent heating and cooling. Calculation period is one month or one hour or (for residential buildings) the heating or cooling season. Provides common rules for the boundary conditions and physical input data irrespective of the chosen calculation approach.</p>
EN ISO 13791	<p>Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – General criteria and validation procedures</p> <p>CONTENT: Specifies the assumptions, boundary conditions, equations and validation tests for a calculation procedure, under transient hourly conditions, of the internal temperatures (air and operative) during the warm period, of a single room without any cooling/heating equipment in operation. No specific numerical techniques are imposed by this standard. Validation tests are included .</p>
EN ISO 13792	<p>Thermal performance of buildings – Calculation of internal temperatures of a room in summer without mechanical cooling – Simplified methods</p> <p>CONTENT: Specifies the required input data for simplified calculation methods for determining the maximum, average and minimum daily values of the operative temperature of a room in the warm period, to define the characteristics of a room in order to avoid overheating in summer at the design stage, or to define whether the installation of a cooling system is necessary. Gives criteria to be met by a calculation method in order to satisfy the standard.</p>

EN ISO	Title and Content
prEN ISO 14683	<p>Thermal bridges in building construction – Linear thermal transmittance – Simplified methods and default values</p> <p>CONTENT: Deals with simplified methods for determining heat flows through linear thermal bridges which occur at junctions of building elements. Specifies requirements relating to thermal bridge catalogues and manual calculation methods. Provides default values of linear thermal transmittance.</p>
EN ISO 15927-1	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 1: Monthly and annual means of single meteorological elements</p> <p>CONTENT: Specifies procedures for calculating and presenting the monthly means of those parameters of climatic data needed to assess some aspects of the thermal and moisture performance of buildings. Covers air temperature; atmospheric humidity wind speed; precipitation; solar radiation; long wave radiation.</p>
prEN ISO 15927-2	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 2: Data for design cooling loads and risk of overheating</p> <p>CONTENT: Gives the definition and specifies methods of calculation and presentation of the monthly external design climate to be used in determining the design cooling load of buildings.</p>
prEN ISO 15927-3	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 3: Calculation of a driving rain index for vertical surfaces from hourly wind and rain data</p> <p>CONTENT: Specifies a procedure for analysing hourly rainfall and wind data derived from meteorological observations so as to provide an estimate of the quantity of water likely to impact on a wall of any given orientation, taking account of topography, local sheltering and the type of building and wall.</p>
EN ISO 15927-4	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 4: Data for assessing the annual energy for heating and cooling</p> <p>CONTENT: Specifies a method for constructing a reference year of hourly values of appropriate meteorological data suitable for assessing the average annual energy for heating and cooling.</p>
EN ISO 15927-5	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 5: Winter external design air temperatures and related wind data</p> <p>CONTENT: Specifies the definition, method of calculation and method of presentation of the climatic data to be used in determining the design heat load for space heating in buildings, including the winter external design air temperatures, and the relevant wind speed and direction, where appropriate.</p>
prEN ISO 15927-6	<p>Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 6: Accumulated temperature differences (degree days)</p> <p>CONTENT: Specifies the definition, method of computation and method of presentation of data on accumulated temperature differences, used for assessing the energy used for space heating in buildings.</p>