

Implementation of the requirements to energy performance of buildings in Lithuania

2012-04-13 Vilnius

Directive 89/106/EEC

The building (its part) must be designed and built from such construction products the properties of which would ensure for an economically reasonable working life of the building the energy economy and heat retention, the essential building requirement, i.e. that the amount of energy required in use, having regard to the climatic conditions of the location and the occupants, shall not exceed the required (i. e. the calculated amount in accordance with the requirements of hygiene standards and according to the requirements to the intended use of the building or its premises).

Directive 2002/91/EC and the recast Directive 2010/31/EC

The directive lays down requirements as regards:
the common general framework for a methodology for calculating the integrated energy performance of buildings; the application of minimum requirements to the energy performance of buildings; the application of minimum requirements to the energy performance of existing large buildings that are subject to major renovation; energy certification of buildings.

Directive 2010/31/EC (PEND)

The directive defines an updated methodology for calculating the energy performance of buildings. The minimum requirements for buildings and building units are set by Member States. When setting energy performance requirements for technical building systems, Member States are encouraged to use the harmonized measures.

A comparative methodology for calculating cost-optimal levels of minimum energy performance requirements for buildings is defined (15% limit). Mandatory procedures are defined for considering new buildings in respect of possibility of alternative energy supply systems.

Law on Construction of the Republic of Lithuania

The minimum requirements on the energy performance of buildings are mandatory to:

new buildings; existing buildings that are subject to reconstruction or overhaul and a total useful floor area of which is over 1000 square meters and the price of works done during reconstruction or overhaul in order to upgrade their energy performance makes up to 25 per cent of the value of the building, excluding the value of the plot of land on which the building is situated (as much as this is technically, functionally and economically feasible)

Law on Construction of the Republic of Lithuania

The minimum requirements on the energy performance of buildings are not applied to:

buildings which are structures of cultural heritage, where compliance with the requirements would unacceptably alter their character or appearance; buildings used as houses of worship and for other religious activities; temporary buildings with a planned time of use of two years or less.

STR 2.01.01(6):2008

STR 2.01.01(6):2008 „ESSENTIAL REQUIREMENT TO A BUILDING „ENERGY ECONOMY AND HEAT RETENTION“

Objective of the Regulation – in accordance with CPD, to concretize the essential requirement to a building “Energy economy and heat retention” in order to assess how the legal acts of the Republic of Lithuania in this field correspond to CPD; to prepare new (to replace, amend the currently valid) normative documents, also to adopt by Lithuanian sustainable standards the European sustainable standards.

STR 2.01.01(6):2008

The Regulation is mandatory for preparing normative construction technical documents, normative documents for the safety and intended use of a building and essential requirements to a building (one, several or all of them) and technical parameters of a building in accordance with the legal acts defining the levels and the classes of characteristics of buildings or construction products. Also, for the participants of construction process, public institutions responsible for the supervision of the requirements of construction, safety and intended use of a building, municipalities the activity principles of which in the construction sector are set down by the Law on Construction.

STR 2.01.01(6):2008

Energy economy and heat retention could be regulated by the following five means:

1. by defining requirements to construction products used for the partitions (their thermal resistance, water vapour propagation resistance, emission of the layer reflecting infrared rays);
2. by defining requirements to the characteristics of partitions and installations of the engineering systems of a building (e. g. thermal conductivity of walls, roofs, doors and windows, tightness of doors and windows, efficiency of boilers, ventilators and cooling installations);
3. by defining requirements to the characteristics of the use of a building or its engineering systems (e. g. specific heat loss, air conductivity, air circulation, general efficiency of heating or cooling system);

STR 2.01.01(6):2008

Energy economy and heat retention could be regulated by the following five means:

4. by defining requirements to the energy output of the engineering systems of a building (e. g. annual amount of thermal energy necessary to heat and (or) to cool the premises of a building up to envisaged temperature, taking into consideration internal heat emissions and amount of incoming solar energy);
5. by defining requirements to the energy output of the engineering systems supplied to a building in order to assess the properties of the use of systems and to determine their efficiency (e. g. heating and (or) cooling energy consumption), taking into consideration the peculiarities and the cost of energy source.

Characteristics of construction products:

Density, dimensions and their stability

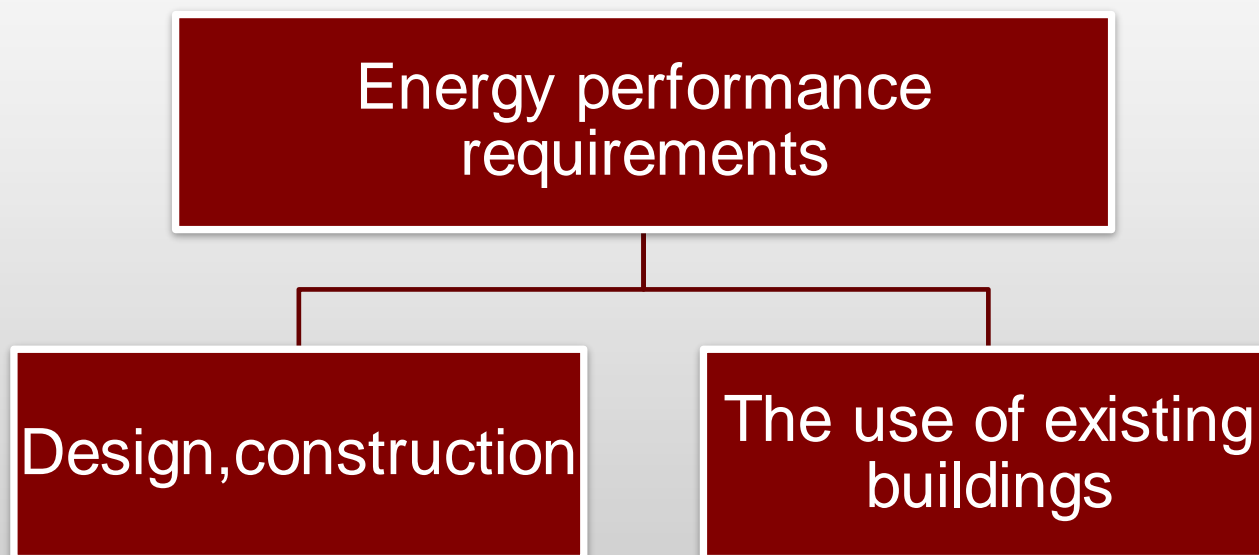
- Thermal conductivity or thermal resistance under different humidity
- Specific heat
- Thermal expansion coefficient
- Diffusion water vapour propagation resistance
- Moisture expansion coefficient
- Amount of hygroscopic humidity under different relative humidity
- Water absorption
- Air conductivity
- Mechanical characteristics (pressure resistance, tensile strength, modulus of elasticity, Poisson's ratio)
- Coefficient of long-wave radiation
- Coefficient of long-wave radiation conductivity
- Coefficient of solar radiation conductivity and absorption

STR 2.01.01(6):2008

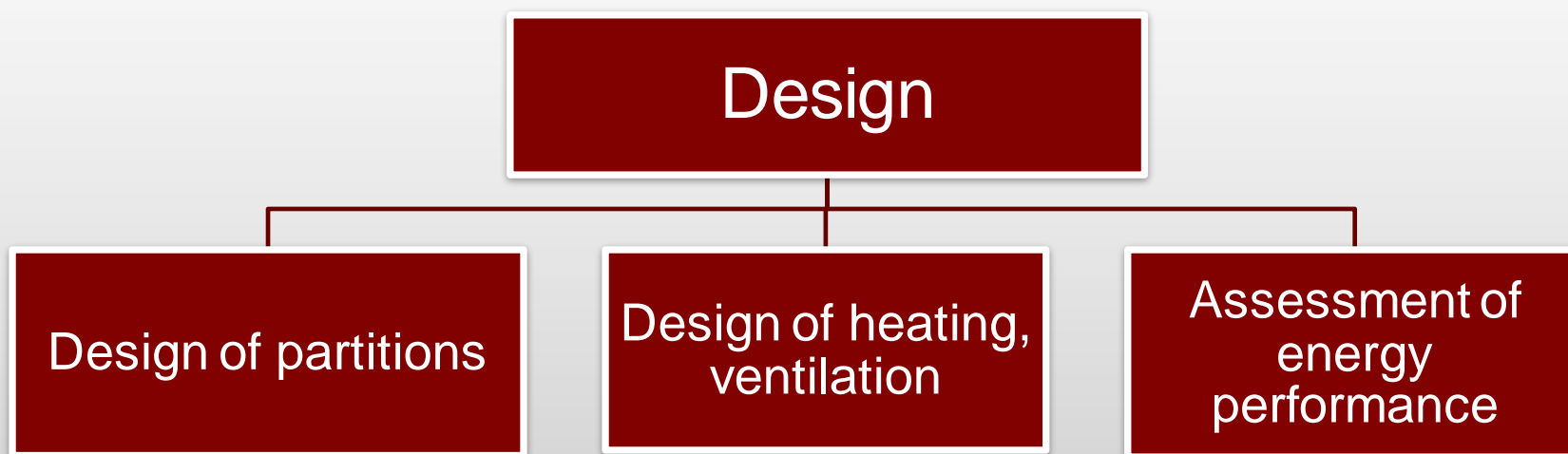
Characteristics of partition elements:

- Heat transfer or thermal resistance
- Equivalent conductivity or thermal resistance of all types of brickwork
- Moisture transfer
- Resistance to diagonal rain
- Air conductivity
- Characteristics of thermal inertia
- Transfer of solar energy
- Characteristics of the useful area and the yield of ventilation holes

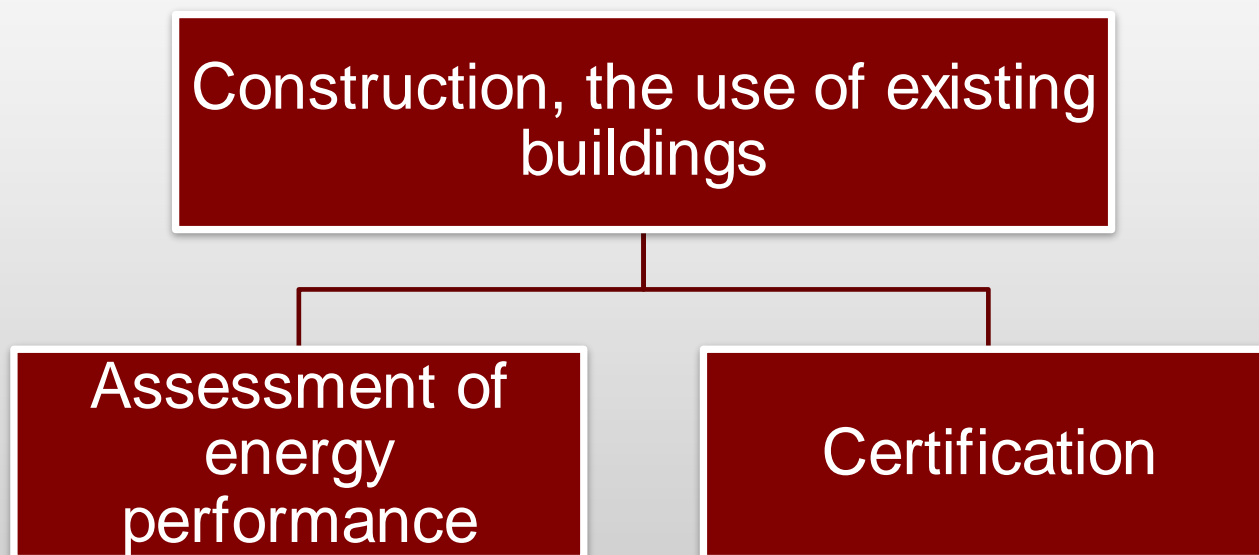
Main technical regulations



Main technical regulations



Main technical regulations



STR 2.05.01:2005 “Thermal technologies of the partitions of a building”

STR 2.09.02:2005 “Heating, ventilation and air-conditioning”

STR 2.01.09:2005 “Energy performance of buildings. Certification of energy performance”

STR 2.05.01:2005 “Thermal technologies of the partitions of a building”

The Regulation defines thermal technical requirements for designing partitions of residential and non-residential buildings. Exact technical requirements for the types and parts of partitions. Methodology for calculating thermal characteristics of partitions.

STR 2.09.02:2005 “Heating, ventilation and air-conditioning”

The Regulation is used when designing and installing heating, ventilation and air-conditioning systems in buildings and in premises of engineering structures. Describes the main requirements to the systems.

STR 2.01.09:2005 “Energy performance of buildings. Certification of energy performance”

- Defines obligatory requirements and obligatory certification of buildings
- Methodology for calculating the energy performance of buildings
- Energy performance requirements
- Requirements to energy performance of buildings
- Energy performance of a building – the calculated amount of energy expressed as a class of energy performance of a building and required when using a building according to its purpose.
- Assessment of energy performance of a building is performed by calculating the sum energy inputs of a building.

Energy inputs are determined by assessing:

- thermal loss through the walls of a building;
- thermal loss through the roof of a building;
- thermal loss through external ceilings of a building;
- thermal loss through the ceilings of a building above unheated basements and cellars;
- thermal loss through the partitions of a building which abut on the soil;
- thermal loss through the windows of a building;

Energy inputs are determined by assessing:

- thermal loss through external entrances of a building, except for the thermal loss due to repeated opening of doors;
- thermal loss through thermal bridges of a building;
- thermal loss through repeated opening of external entrances;
- thermal loss due to ventilation of a building;
- thermal loss due to over-infiltration of outside air to the premises through windows and doors;
- heat inflow from the outside;
- internal heat emissions.

Also, the following energy consumptions must be assessed:

- annual consumption of electric power;
- annual energy inputs for hot water.

It is required to calculate the normative sum, reference sum and the estimated sum energy inputs per one square meter of useful area of a building (its part). The value of qualifying indicator C of a building (its part) must be calculated and energy performance class of a building (its part) determined according to these inputs.

Requirements to energy performance of buildings

Minimum energy performance requirements:

- For new buildings – class C, there is a transition to the application of the requirements of class B.
- For buildings subject to major renovation (>1000 m²) – class D.

The expected changes in normative requirements for the newly constructed buildings are

2013 - 2014 – class B

2016 – class A

2018 – class A+

2021 – class A++

Requirements to energy performance of buildings

Energy performance requirements are not set for:

- buildings of cultural heritage if the requirements would unacceptably alter their character or appearance; buildings used as places of worship and for religious activities; temporary buildings with a time of use of two years or less; buildings which are intended to be used for rest or summer gardens for less than four months of the year.

Directive 2010/31/ES (PEND)

Member States shall ensure that:

by 31 December 2020 all new buildings are nearly zero- energy buildings; and after 31 December 2018 the buildings of public authorities are nearly zero-energy buildings.



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Thank you for your attention!



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