B-AD1

THERMAL PROTECTION OF PERIMETER WALLS

Number	B-AD1
Indicator name	Thermal protection of perimeter walls
Area	A
Indicator definition	The predominant thickness of the thermal insulation material used to insulate the building
Indicator unit	mm
Key words	Insulation, insulation, thermal insulation

Reason for tracking and usability

The method, extent and efficiency of insulation has an impact on greenhouse gas emissions from the energy consumed for heating and cooling.
The indicator mainly takes into account the structural composition of the perimeter cladding, the thickness of the thermal insulation material, the type of facade: ventilated facade, the facade with a contact thermal insulation system, the scope of application of the thermal insulation material with regard to the cardinal directions. The starting point is the current legislation and standard requirements, in particular the European Directive on the Energy Performance of Buildings (EPBD and its latest revision 2018/844/EU), which is together with the Energy Efficiency Directive the main legislative instrument for promoting the energy performance of buildings and speeding up the renovation of buildings in the EU.
The thermal resistance of a material represents the ability of the material to retain heat. It depends on the thickness of the material and the thermal conductivity. It is denoted by the letter "R" and the unit of measure is m2K/W, i.e. how big area is needed to transfer unit heat at a temperature difference of 1 Kelvin/degree. The transfer of heat from the air to the structure creates a thermal resistance, which can be characterized as a resistance to heat transfer. The total thermal resistance of the structure is then the sum of the thermal resistances of the individual layers and the heat transfer resistances.
The heat transfer coefficient "U" is the inverse value of thermal resistance. The unit of measure is W/m2K, i.e. how much heat passes through a structure with an area of 1 m2 at a temperature difference of 1 Kelvin/degree. The lower the U-value, the better thermal insulator is the material.
The heat conductivity coefficient "λ" (lambda) can be defined as the ability of a material to conduct heat. The unit of measure is W/mK, i.e. how much heat passes through the 1 m thick material with a temperature difference of 1 Kelvin (difference 1 K = difference 1 °C). The lower the value of λ, the better thermal insulator is the material.
The phase shift of temperatures is closely related to the storage capacity of building materials and represents a time shift of extreme temperatures. An example is the situation where the highest outdoor afternoon temperatures are shifted to a later time and at the same time their value is dampened.

Completeness, representativeness, validity	The indicator is based on the assumption that the basic evaluation can be performed only on the basis of determining the predominant thickness of insulation, regardless of the material used. When scaling, we do not distinguish between renovated buildings and new buildings. Most of the newly built buildings have packaging structures designed with an insulation system. Nevertheless, this methodology allows for newly built buildings, where the required thermal insulation properties are provided by the construction material itself without insulation, to classify the building according to the approximate value of the average heat transfer coefficient corresponding to wall insulation with thermal insulation material. In the further specification of scaling, it would be possible to state the thermal resistance of the structure, resp. U value, that is, for the overall composition of the wall, this information is usually given in the project documentation, respectively in the energy certificate.
Description of data processing	Thermal insulation materials that are most often used for thermal protection of non-transparent vertical perimeter structures are extruded polystyrene (EPS) and mineral wool (MW). Due to very similar values of the thermal conductivity coefficient (λ) for EPS (0.036 W / mK) for MW we use the term thermal insulation material. To calculate the indicator, we determine the predominant thickness of the thermal insulation material used on the building structures. According to the detected value, the building is included in the appropriate interval in the scale. The walls and the roof are evaluated separately. For (new) buildings, where the thermal insulation properties are not provided by contact insulation, it is possible to classify the building according to the heat transfer coefficient for the perimeter wall on the basis of the following table: Insulation layer thickness (PS/wool) 0 (without insulation) - 180 mm - 0,15 Un (W/m2K)
Data source	Project and construction documentation, approval decision, building office, owner's / administrator's own data
Tracking frequency	One-time, update on change

Urban influence	The city/city district/municipality can directly invest in the renovation of buildings owned by it, possibly support the renovation of buildings financially or otherwise.
Presentation method	The results will be presented in a uniform KLIMASKEN framework on a five-point scale according to the set intervals: 5(E): 0 mm; 4(D): < 80 mm; 3(C): 80–120 mm; 2(B): 121–180 mm; 1(A): > 180 mm
Responsibility	Owner, building manager