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ALUMINUM CONSTRUCTION FOR PROTECTION ELEMENTS OF THE BUILDING COVER AND THE ENERGY EXCHANGE

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Abstract
In practice, energy conservation is the reduction of the required amount of energy for a concrete result. Efficient energy use means technological application for efficient resolution in the covering of energetic needed data. (ex. Preservation of desired temperature, while we have the reduction of the energy in heating/cooling, by using with efficiency thermo isolation or devices, profitable installation, etc.). Essentially, this refers to the rapport between the amount of energy consumed in practice and the initial amount of energy used.
Keywords: thermo isolation, energy conservation, aluminum construction

1. ENERGY CONSERVATION

1.1. Diminution of energetic consumption

Peoples get a considerable impact, on energetic consumption, when they use the aluminum cover layers in the buildings. Practically, the energy conservation should assume as the process of using less energy in order to reach the required results. We should agree that, the efficient energy use mean, efficient technological implementation in order to fulfill all energetic needs. In this view point, maintain the desirable temperature in the same level by decreasing periodically the warming energy, or keep fresh through the thermo isolation efficiency, further using special apparatus, rentable installation etc. This is a ratio between, the practical amounts of energy consuming and inputs of energy.

Energetic efficiency, for actual products in constructive elements, and specifically in aluminum construction such as cases and frame, façade, buildings, apparatus, include all characteristics which decide on their behavior on energy consumption. Energetic yield on building, must calculated as the amount of energy consumed in reality, in order to fulfill common needs of the building, such needs comprise warming, water heating, freezing, ventilation and lighting. This amount of energy can be expressed with one or more mathematical indicator. Indicators are calculated taking in consideration isolation, technical and installation characteristics, ratio of planning and location with climate factors, sun exposure even the neighbor buildings, energy auto generated from the building itself and other influenced factors on energy needs including the climacteric condition within the building.

Energy consumption commonly imposed from needs to keep in the same level inner climacteric condition of buildings. Here are included consume for worming and coolness, ventilation, lighting which are in functions of thermal conformity as well as using in different electro machines for daily purposes.

The greatest end-user consumers are buildings. Within EU, this consumer uses almost 40% of the total amount of energy. Within one building, worming the space-area consume 69% of the total energy, water heating need 15%, lighting and electro machines use 11% of the total energy.

Building sectors shows that, increase rhythm of energy consumption reach a level of 7% yearly average. This is mainly dictated from the air-climate equipment and micro-equipment. Such rhythm already stabile in EU is not true for the countries with intensive development including Albania.

1.2. Protective cover, applied in building and the energy exchange

Protective cover applied in building play a filter role between outside and inside environment. Air movement, dust, rain, humidity, temperature change and radiation have the same impact even in the inner space of the building but, in much lower ratio. The difference between outside and inside areas is that: outside you have huge dynamic changes and uncontrolled in time, inside you have limited influences even further you can control changes in time.

Protective cover, applied in building is a decisive element on energy exchange between outside and inside environment, thus it switches in an important element on building thermal efficiency figure 1.

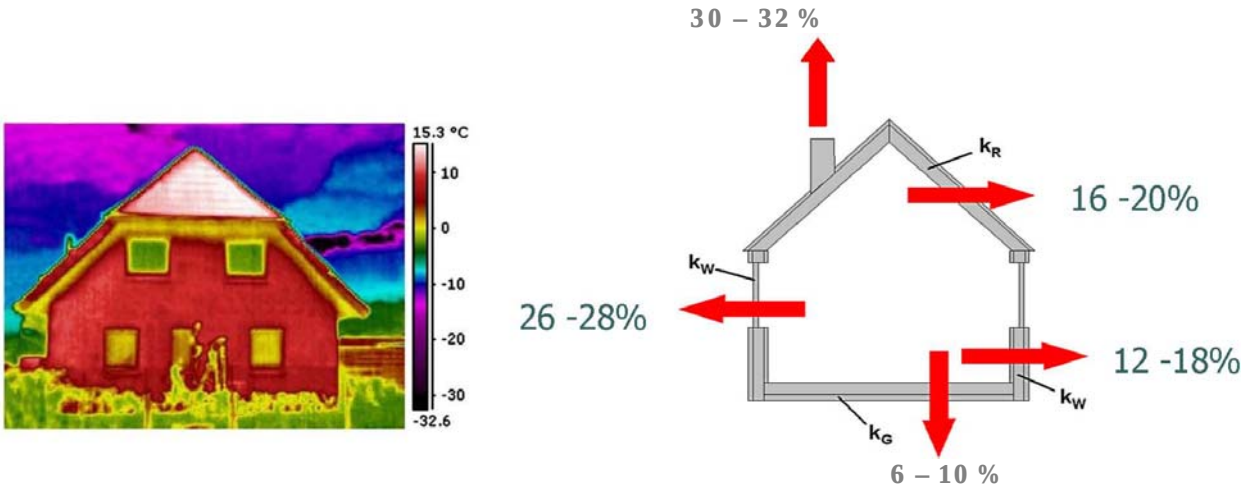


Figure 1. Effects, of compound elements in total thermal loss

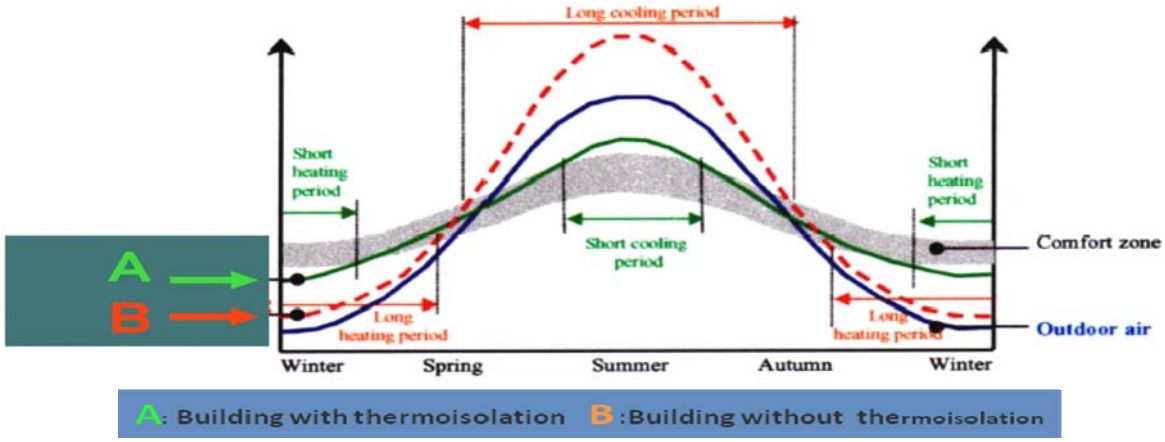


Figure 2. Inner temperature and thermal conformity during the year

The main goal, on modern energetic planning, is control and reducing thermal losses during the winter and thermal benefit during the summer figure 2.

Thermal-isolation is the key material, which drastically limits the warming amount of energy circulating between protective cover and building. Basements, frames and glasses play an active role in factors mentioned above. They are predominant parts of protective cover of building. Protective cover fixes the energy exchange rate between outside and inside environment, thus it results to be a decisive factor on general effectiveness of building.

2. RULES IMPROVEMENTS, ON ENERGY CONSUMPTION

Rules improvements, on energy consumption, have brought a significant result within the EU countries. If we compare energy consumption in the building we will have the following scenario: previous 1980 consumption has been 200-300 KWh/m2 yearly average, today the modern buildings within EU consume 30-70KWh/m2 yearly average. The major improvements derive from implementation of new technologies such as, thermal-isolation covers, basement implementation, frames application, glasses facades which are the nowadays European common technologies.

The difference, of the thermal diffusion coefficient, between a simple window (U>4W/m2K) and a windows with latest technology (U<0,8W/m2K), show the potential amount of energy that we can save. It is worth emphasizing that, for 0,1W/m2K saving in thermal isolation of frame, we reduce (1,21/m2) 1.2Liter petroleum per square meter of frame in a year. Guidelines and legal-framework, issued from EU commission, for the energetic saving in buildings during last 10 years emphasize requirements and conditions for improving energy saving, protecting warming level, as well as certifying building for energy use and for minimal energetic efficacy.

Thermal isolation glasses, passive worming and cooling are included in the measure should taken in order to improve the energetic yield.

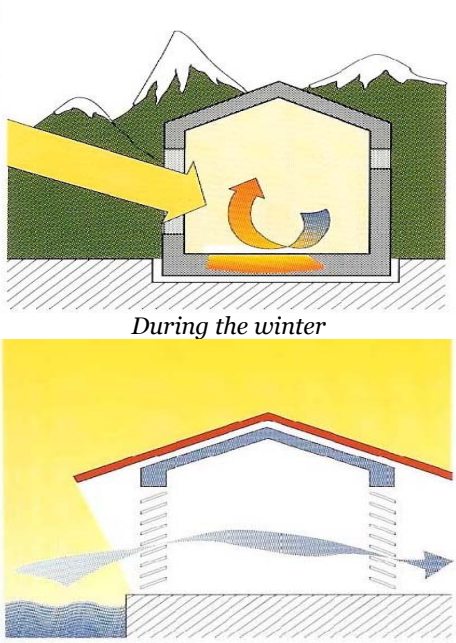
3. CONTEMPORARY REQUESTS

Aluminum construction isn't a losses source for thermal, even further, they do not influenced negatively in energetic balance, in contrary, they are a positive factor in thermal balance due to the fact they auto-control energy generation and have a very positive impact in realizing building with null energy consume.

Cases, frames and glasses should reduce thermal looses, when climacteric condition impose warming, also they should benefit from sun rays to reach an equilibrium of losses. Finally we should say improving technology to reduce losses. When climacteric conditions impose cooling they should reduce the cooling loads. Finally a dynamic control is needed instead of the static one figure 4.

Cases, frames and glasses should maximize the benefit from sun rays during the winter period. They should accumulate energy and diffuse it in inner area of building, in harmonic combination with materials which increase thermal capacity; meantime they should reduce thermal losses without reducing air circulation.

During the summer materials should eliminate the over-warming within the building, allow passing the warming through the air circulation and passive freshness.



During the winter

During the summer

Figure 4 building with null energy consume

Cases, frames and glasses should warranty in any case healthy and relax life, contributing in thermal comfort, air quality in inner areas, optic conformity, acoustic conformity and security. Meantime they should assure the proper ratio on yield, function, time and costs.

Table 1 Coefficient of thermal diffusion for different types glasses frames

Type of glass frame	Thickness of glass frame (in mm)	Air in the empty place	Thermal diffusion coefficient (W/m2K)
Uneven	6	-	5,7
Uneven	8	-	5
Doublo	4-6-4	Air	3,4
Doublo	4-12-4	Air	2,9
Doublo-low translation	4-10-4	Air	2,0-2,4
Doublo-low translation	4-12-4	Air	1,7-2,4
Doublo-low translation	4-6-4	argon	2,1-2,6
Doublo-low translation	4-12-4	argon	1,3-1,7

4. CONCLUSIONS

In practic, energy conservation is the reduction of the required amount of energy for a concrete result. Efficient energy use means technological application for efficient resolution in the covering of energetic needed data. (Ex. Preservation of desired temperature, while we have the reduction of the energy in heating/cooling, by using with efficiency thermo isolation or devices, profitable installation, etc.). Essentially, this refers to the rapport between the amount of energy consumed in practice and the initial amount of energy used.

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