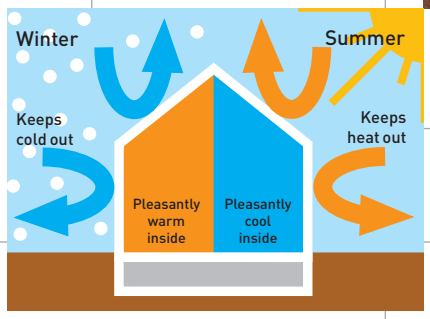
YTONG

Housing

Thermal insulation



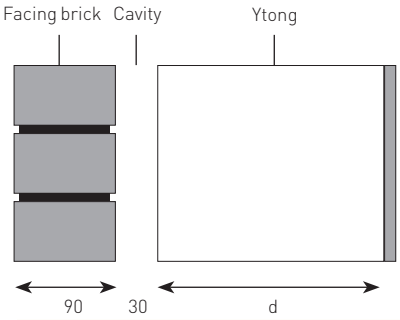
A well-insulated house or apartment is extremely important, both in terms of your own budget and the environment, which affects us all. Also, there are strict legal rules and checks concerning thermal insulation.
An overall thermal insulation level of K55 applies to the dwelling as a whole.
A heat transmission coefficient "U" of less than 0.6 W/m²K must be observed for the outer walls.

Xella

High insulation value

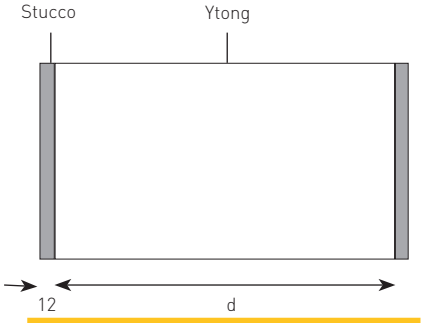
To satisfy the conditions imposed in most European countries, **the U-values of the wall must be less than 0.6 W/m²K**.
The tables below give the U-values for the various types of Ytong walls. In each case, these values are so low that extra insulation material becomes superfluous and the overall insulation level K55 is easily achieved.

Ytong WALL WITH FACING BRICK
U-values (W/m²K)



Thickness Ytong	Type C2/04	C3/05	C4/06
(mm)	λ_{Ui}=0.10	λ_{Ui}=0.12	λ_{Ui}=0.15
175	0,48	0,55	0,66
200	0,42	0,49	0,59
240	0,36	0,42	0,51

Ytong WALL WITH STUCCO
U-values (W/m²K)



Thickness Ytong	Type C2/04	C3/05	C4/06
(mm)	λ_{Ui}=0.10	λ_{Ui}=0.12	λ_{Ui}=0.15
240	0,38	0,45	0,55
300	0,31	0,37	0,45
365	0,26	0,31	0,38

λ_{Ui} = arithmetic value of thermal conductivity in W/m.K to standard NBN B 62-002/A1

This is because the insulation values of the various building materials are now laid down in an addendum to standard NBN B 62-002 and they allow an inspector to firmly establish the overall insulation level of your dwelling.

Is it still possible to build without additional insulation material?

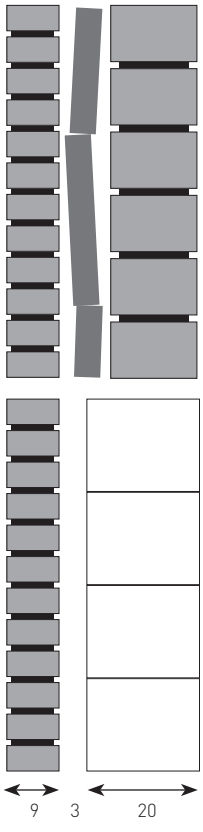
You can simply use Ytong to build a wall of traditional thickness (inner leaf + cavity + facing brick or massive wall + stucco = 30 cm)
without having to install an additional layer of insulation. A double wall consisting of Ytong blocks of minimum 17.5 cm with facing brick and an air cavity, as well as a massive wall consisting of Ytong blocks of minimum 20 cm combined with plaster, remain below the standard (U " 0,6 W/m² K).

Effective insulation

Not only does the insulation of a house have to comply with all the applicable regulations "on paper", it also has to be correctly put in place on site. Regrettably, it has to be concluded that this is not always the case. To be genuinely effective, the insulating plates must be installed in a specific way, namely mounted perfectly against the inner leaf and joined together.

The slightest break in the continuity of the insulation results in cold air circulating between the inner leaf and the insulation. Not only can this lead to a drop in the insulation level of the wall, it can also produce thermal bridges. These cold bridges can have serious repercussions for the building in question (internal condensation, the appearance of damp spots on the walls).
Ytong can offer an effective solution to this problem. Ytong is insulating in itself, and there is no need to fit additional insulation. No more problems caused by poorly installed insulation.

By building with Ytong, you always get a long-lasting insulation that is also 100% effective. What's more, the insulation values of Ytong blocks exceed those of the strictest regulations, and this automatically leads to additional savings on heating costs. All without having to pay for your insulation!



Wall made from concrete blocks or other material
+ insulation
+ facing brick

The insulation material is often poorly installed on site, leading to cold bridges or moisture seeping in.

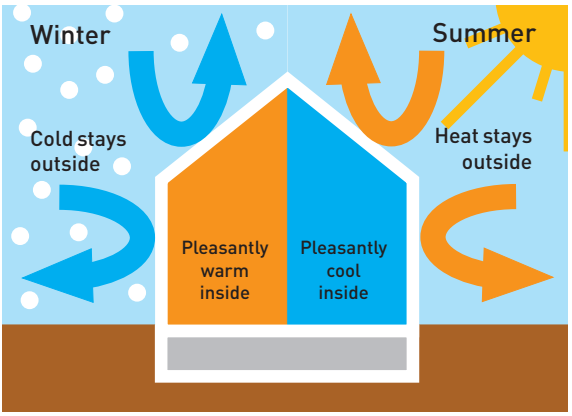
Ytong solution

No insulation material in the cavity.
No risk of cold bridges or water seeping in.
No chance of damaging the insulation material.
This system offers 100% effective insulation for the whole lifetime of the building.

Apart from the insulation values, which directly impact energy use, it is also important to consider the level of comfort and quality of life in the dwelling. Here too, Ytong distinguishes itself with its exceptional qualities.

Thermal inertia

During very warm periods (or periods with large amounts of sunshine), a well-insulated dwelling with good thermal inertia remains pleasantly cool during the day, but maintains just as good a temperature at night.



As soon as the ambient temperature rises, any building material will absorb a certain amount of heat.
This amount of heat per m^2 is known as the **thermal capacity** (B). The greater the mass of the material, the higher the value. A concrete block has high thermal capacity (thanks to its mass), but low thermal inertia because it is not insulating. To achieve good **thermal inertia**, the external wall must have a high thermal capacity (B) so that they absorb large amounts of heat. They must also be insulating so that the heat does not pass through to the other side of the wall too quickly.
The ratio A=B.thickness/λ must therefore be as high as possible.

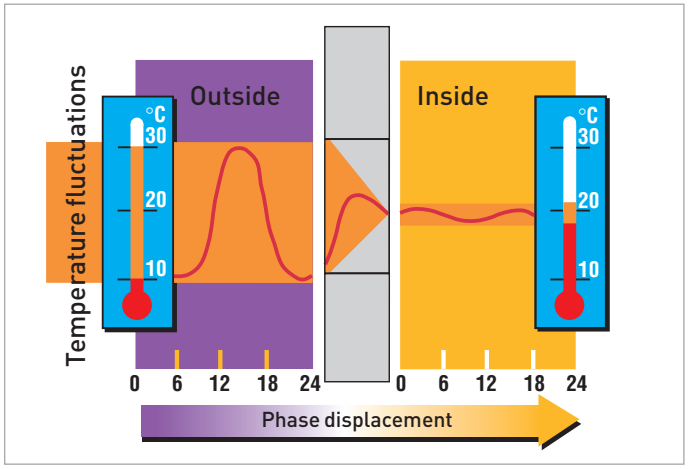
This can only be achieved if the material used is both insulating and heavy.
A "pure" insulation material has a very low mass and cannot store up the heat. In fierce sunshine, this then gives rise to the "caravan effect", whereby it becomes unbearably hot in the interior area within a very short space of time.
Ytong has the properties of an insulation material but also a considerable mass (between 400 and 700 kg/m^2). It therefore satisfies all the conditions for creating good thermal inertia.
Thus, it appears that the A-value of Ytong is higher than that of other common construction materials.
If the thermal inertia is higher (high A-value), this results in a large phase displacement and thermal damping.

Two major conditions for enjoying ideal comfort during the summer months:

•With a large phase displacement F (the difference in time between the maximum temperatures inside and outside), the effect of the midday sun is only felt in the evening. Therefore, to maintain a constant temperature you only need to use ventilation at night.

•With high thermal conductivity (the difference between the maximum outside temperature and the maximum inside temperature), a heat peak of 40°C outside is converted to a heat peak of 22°C inside after the phase displacement F.

The following figure shows that Ytong performs exceptionally on both levels.

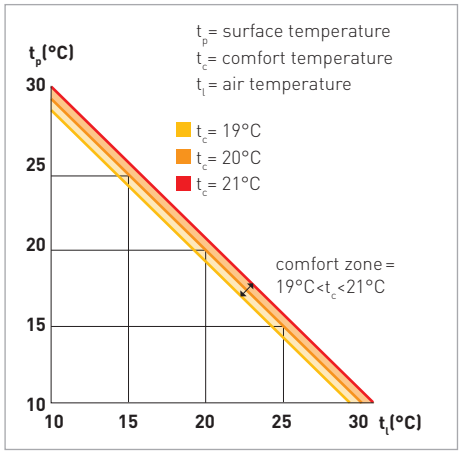


The surface temperature of the walls

Thermal comfort is a feeling of well being that is largely created by the comfort temperature t_C. This is the average of the air temperature t_l and the surface temperature t_p:

$$t_c = \frac{t_l + t_p}{2}$$

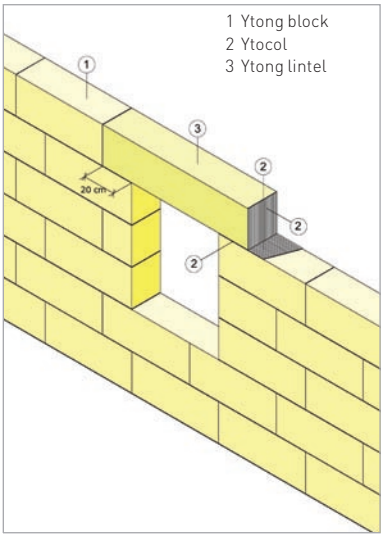
the comfort zone lies between t_C= 19°C and t_C= 21°C. The diagram shows that in a room with a surface temperature of 15°, a feeling of comfort (t_C= 20°C) is only reached if the air temperature is 25°C



Since we know that increasing the air temperature by 5°C raises energy consumption by 40%, the importance of a higher surface temperature immediately becomes clear.
Thanks to its insulating structure, Ytong contributes to a higher surface temperature, thereby making it possible to save on heating costs and guarantee optimum comfort in the dwelling at all times.

No cold bridges

A cold bridge is a zone where the insulation of a house is weaker.
If there are not too many cold bridges, they have little impact on annual energy consumption. Nevertheless, they can have disastrous consequences.
If the surface temperature of the walls drops below a certain temperature (14°C under normal conditions), damp and mould problems can arise due to air condensing on the wall.
These cold bridges and the associated condensation problems can easily be avoided by using Ytong U-blocks, U-lintels or normal lintels.



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