
CELLULOSE

Natural insulation.



ISOCELL

NATURALLY THERE

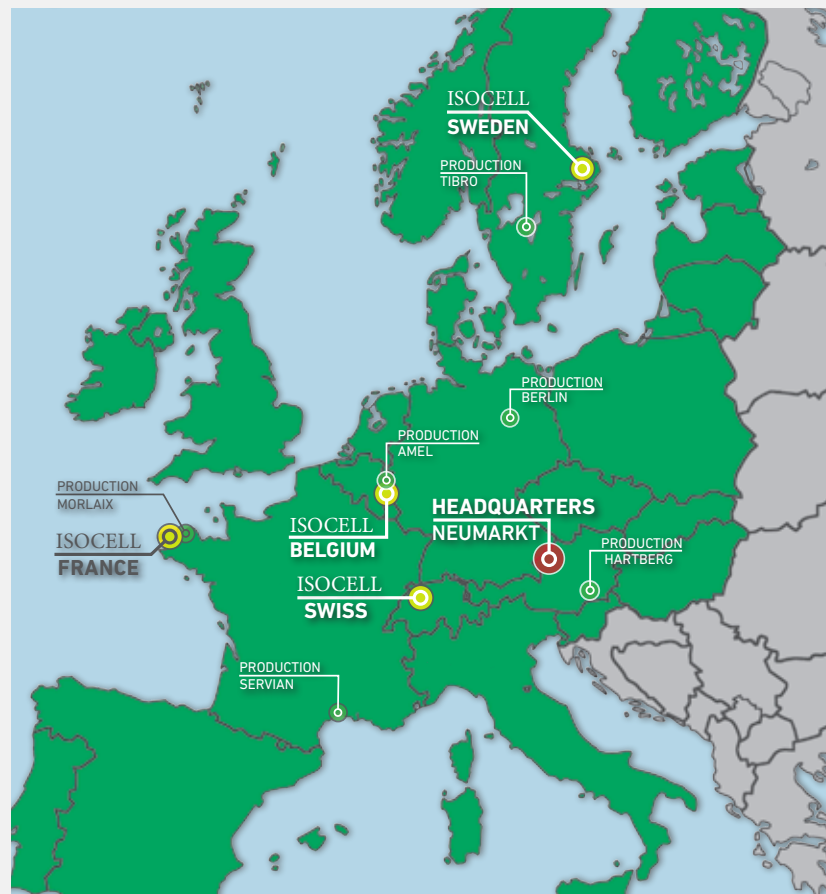
Cellulose - a product from nature. As the main component of plants and trees, its function is to stabilise the cell walls. Cellulose is the most abundant organic compound. Without cellulose no trees. Without trees no paper. Without paper no natural thermal insulation.

Already aware?
EPD is an environmental product declaration based on internationally agreed standards. It forms the data basis for ecological building evaluations, from erection, via use to demolition and disposal. The environmental footprint of a product is also determined using these data. Cellulose leads by far and with the top score.



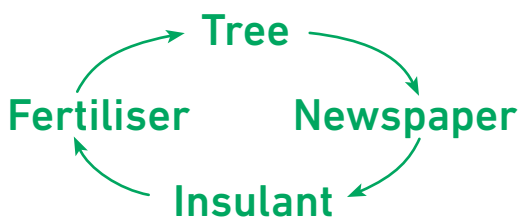


ISOCELL cellulose is natural thermal insulation made of cellulose fibres, which is produced by recycling clean, segregated daily newspapers. Drawing as course fibre, mixing with mineral salts and milling in a mill makes ISOCELL cellulose resistant to rotting and fire-resistant. Production of cellulose insulation takes place at four of our own plants, in Hartberg (Austria), Berlin (Germany), Schoppen (Belgium) and in Tibro (Sweden). Two more plants in France (Morlaix and Servian) operate with ISOCELL know-how.



NATURALLY GOOD FOR THE ENVIRON- MENT

A newspaper needs much less energy to become insulation than other raw materials. As such, it is part of a fascinating, natural cycle that produces a new, independent product with every metamorphosis:

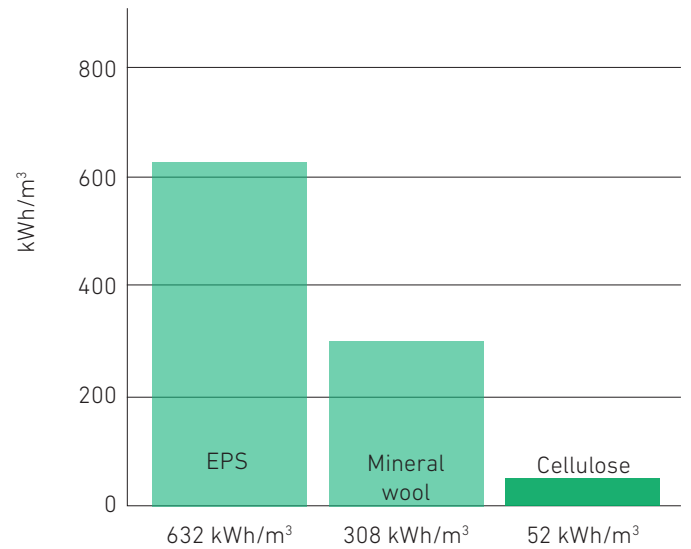


Already aware?
Boric acid, the natural fire inhibitor in cellulose, is approved throughout the EU as a fertiliser in organic farming.
And: ISOCELL-cellulose is produced exclusively with eco-electricity.



Primary energy input (PENRT) Energy input for the production of the insulation material in comparison.

Source: own representation; values: baubook.info



For every kilogram of cellulose blown in, 1.21 kg of CO₂ is removed from the atmosphere. Using cellulose is active climate protection.

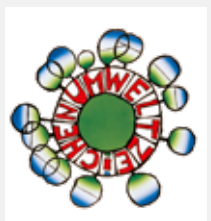


In comparison to other insulation material, primary energy use is significantly less. It amounts to only 30% of glass wool and only 15% of polystyrene (styro-foam).

ISOCELL cellulose insulation reduces CO₂ emissions over decades and saves heating costs.

And the best: while many building materials become a disposal problem, ISOCELL cellulose blooms again as it can be processed into plant fertiliser!

Carbonization (pyrolysis) produces a soil nutrient, which the Indians in the Amazon region already understood 7000 years ago. This plant fertiliser is applied with the manure and, according to the latest findings, reduces the unpleasant smell by up to 75%! And at some point a tree grows again and the cycle closes.



NATURALLY TOP VALUES

ISOCELL cellulose is characterised by a particularly low heat conductivity (AT/EU: 0.038 W/mK, DE: 0.039 W/mK, CH: 0.037 W/mK).

Already aware?

The "Wind Impermeability of Sub-Roofs 2012" project of Holzforschung Austria showed: The heat losses lie for the same joint design and at the same pressure difference for light mineral wool (approx. 10.7 kg/m³) at approx. 100% higher than for heavier mineral wool (approx. 28.5 kg/m³) and at approx. 200% higher than for cellulose insulation (approx. 52.7 kg/m³).





Each insulation is only as good as its weakest point. Therefore, the ISOCELL cellulose also fills the narrowest gaps and crevices. This results in a jointless, thermal bridge-free insulation mat. Compact, with high bulk density and without joints, means no air currents in the insulation. As a result, on comparative measurements under real conditions, cellulose insulation performs much better. Highly trained companies specialising in ISOCELL ensure the high quality of workmanship.

The fibres melt into the construction component to form a tailor-made insulation mat.



NATURALLY THE BEST

The rooms stay cool in the summer, including the underroof areas. ISOCELL cellulose insulation provides maximum performance in heat protection, as in other aspects. And that with enormous endurance, so far without material fatigue.



Already aware?

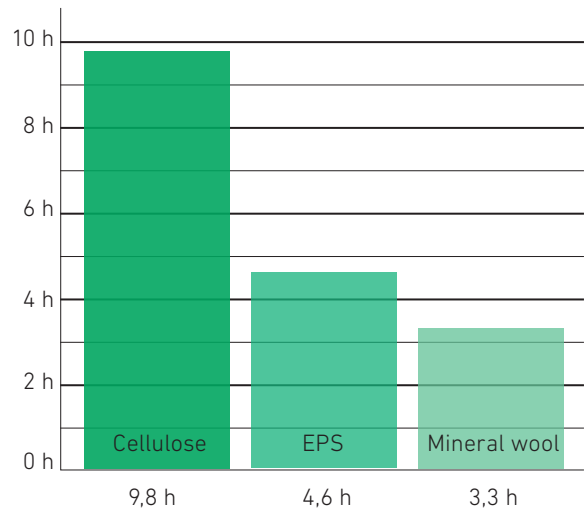
The specific heat capacity of ISOCELL cellulose is 2.11 kJ/kg * K. This value indicates how much energy is needed to heat 1 kg of a material by 1 degree. In the "Energy Efficiency" project of Holzforschung Austria, the insulant with high bulk density is determined as the second most important factor after the surface colour for the summer behaviour of a construction component.



Delayed passage of solar heat

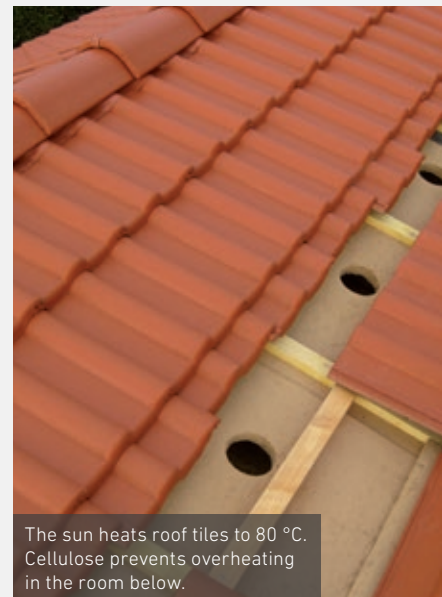
(= phase shift/PHI) for insulation materials in hours and a thickness of 24 cm.

Source: Own representation, Ubakus calculation software.

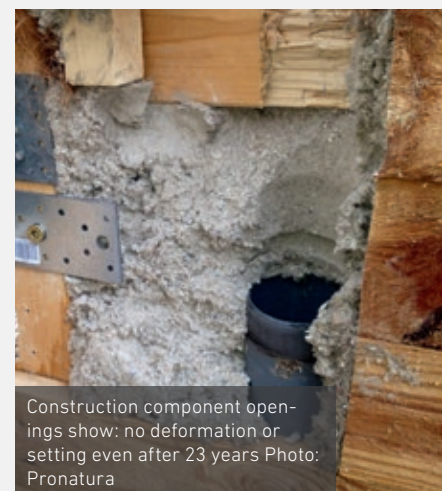


Much more energy is consumed for the cooling of buildings than for their heating. The phase shifting indicates the time required for a temperature wave to reach the room side from the outside of a construction component. The larger the phase shift, the longer the heating of the building interior is prevented.

ISOCELL cellulose exists since 30 years. So far, there is no evidence that the cellulose insulation is altered by ageing.



The sun heats roof tiles to 80 °C. Cellulose prevents overheating in the room below.



Construction component openings show: no deformation or setting even after 23 years Photo: Pronatura

NATURALLY BETTER SOUND INSULATION

Sound becomes noise when it disturbs. ISOCELL cellulose keeps the noise outside (or inside).

Already aware?

Sound propagates in waves through the air. The sound volume is measured in decibels, dB. A normal entertainment is indicated as 40-50 dB, a heavily used road as 80 dB and a compressed air hammer as approx. 100 dB. The pain threshold is 134 dB.





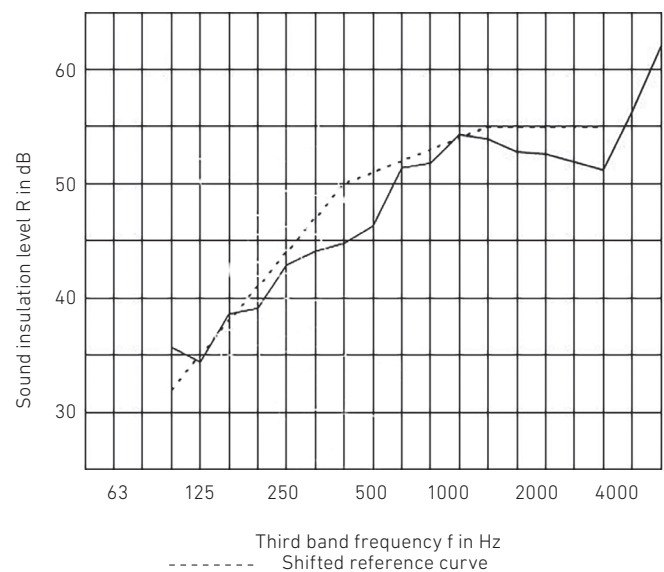
ISOCELL cellulose achieves up to 3 dB for dividing walls and up to 5 dB better sound insulation values for dividing ceilings than found with conventional fibre mats.

Due alone to the fact that cavities are filled without gaps, a better sound insulation level than in the case of mat-form insulation is to be assumed. Incidentally, this was confirmed by TGM Vienna with a comparative test. (Test No. VA AB 11961)



Expert report

TGM - VA AB 11994 on the technical soundproofing properties of prefabricated construction components with ISOCELL cellulose insulant



NATURALLY MOISTURE REGULATING

ISOCELL cellulose has a moisture-regulating effect. It is not only very water vapour permeable, it can also transport moisture in the fibre. It accomplishes this without losing its insulation qualities.

Already aware?

20 °C Warm air with absolute humidity of 9.4 grams per cubic metre corresponds to a relative humidity of 54 %. If one cools this air to 10 °C, the relative humidity rises to 100 %. This is called the dew point. Condensate precipitates on further cooling.





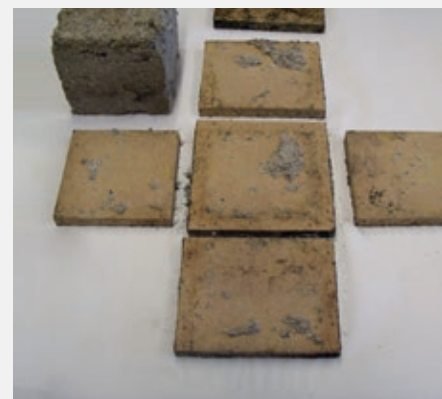
It has long been known that newspaper transports moisture

Moisture transport in the construction component works by diffusion, i.e. from warm to cold. Condensation occurs when the air temperature reaches the dew point.

Cellulose has a capillary conductivity, which means it absorbs any moisture that forms and thus acts against the direction of diffusion. As a result, cellulose becomes a valuable moisture buffer, especially if a drying out of the construction component is only possible on the room-side- such as, for example, in the case of unventilated flat roofs, interior insulation or renovation.

ISOCELL cellulose insulation does not accumulate mould itself and also protects adjacent parts.

Source: DI. (FH) Michael Gomm, "Mould growth on wood and woodwork materials", diploma thesis at the University of Applied Sciences of Carinthia 2009



NATURALLY HIGH FIRE PROTECTION

A series of fire protection tests confirm the positive properties in the case of ISOCELL cellulose burning. Comparative tests show: "Non-combustible" does not actually mean "better in case of fire"! The classified superstructures of REI30 to REI 90 give security in planning.

Already aware?

The term "fire protection" means all measures which make it possible to save people and animals, as well as effective extinguishing in the event of a fire (defensive), as well as all measures to prevent the occurrence of fire by fire or smoke (preventive).





Cellulose insulation burns like wood, controlled, but safe. As a demonstration, cellulose is flame treated at 1000 °C over minutes.



... the surface is charred, but has a fire-retardant effect. The insulation underneath is not damaged.

With the EN classification B-s2,d0 ISOCELL cellulose achieves the best possible assessment for combustible construction materials. It has been shown in an investigation by IBS Linz* that, with a 30-cm thick cellulose layer, the underlying construction component remains protected from heat for 90 minutes.

* Source: IBS file reference 11092607a 2012



NATURALLY EFFICIENT

Cellulose is blown in, not packed. No material drag, no waste. One and the same product for floor, wall and ceiling and for any insulation thickness. This not only saves time and money but also ensures a better quality result when insulating.



Already aware?
The compact, tailor-made cellulose insulation mat even supports the air impermeability of the building envelope. In a comparative test, a nearly 50% lower air flow was measured than in the case of fibre mats.
FIW Munich No. D3-21 / 11



The installation specialist comes with his truck to the construction site and brings everything he needs: blowing machine and cellulose fibres.

The builder, carpenter or drywall constructor has already prepared everything for him. The blowing machine remains on the truck and is filled there with cellulose. The specialist brings the blowing hose to the desired position and work starts. The machine is operated in the truck via radio control. The cellulose fibres are matted in the construction to form a jointless insulation mat. Whether it is floor, ceiling or wall - it is always one and the same product.



The blowing machine is filled on the truck.



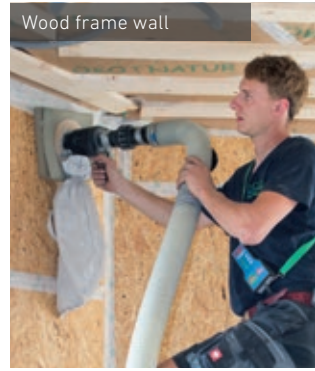
Blown cellulose fibres are like a tightly filled down jacket.

NATURALLY SOLUTION- ORIENTATED

(Almost) everything is possible. An extract from the versatile applications of ISOCELL cellulose insulation.



Roof insulation from the outside



Wood frame wall



Blown ceiling insulation



Roof insulation from inside



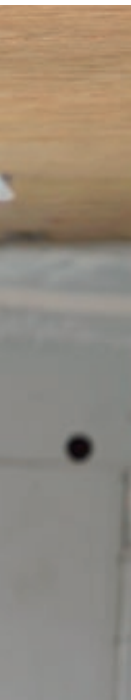
Top floor ceiling



Façade insulation



Walk-in solution with Woodyfix



Insulation wall

For a long time, cellulose insulation has been used for the insulation of wooden frame walls. In addition to cost effectiveness and the best sound insulation values, the ability to adapt to irregular bases is an advantage of ISOCELL cellulose. In the case of interior insulation, however, it scores with high capillary conductivity.

Insulation roof slope

In the case of roof storey extensions, insulation is generally carried out from the inside. When renovating inhabited roof spaces, the insulant can also be introduced from the outside via the roof skin.

Insulation top floor ceiling

For unused roof spaces, the simple solution by open blowing of ISOCELL cellulose is recommended. However, the Woodyfix system also offers a thermal bridge-free, accessible solution. Tie-beam roofs and floors are insulated both by blowing in and by the open blowing process.



In addition, ISOCELL cellulose has also been used as insulation for buffer storage, installation shafts and vaulted ceilings, for example, in churches and as a sprayed visible acoustic insulation.

Insulation of the final floor ceiling



ISOCELL - CELLULOSE FIBRE

ADVANTAGES



- very good thermal insulation values
- outstanding protection against heat
- optimal sound insulation
- high fire protection
- regulates humidity
- no wastage, no joints
- fast and clean
- effective environmental and climate protection

PRODUCT DATA

Composition	Insulation made from loose, unbound cellulose fibre
Rated value of thermal conductivity	Austria EU: 0,038 W / m ² *K Germany: 0,039 W / m ² *K Swiss: 0,037 W / m ² *K
Reaction to fire	Austria: ≥ 100 mm / B-s2, d0 Germany: B 2 nach DIN 4102
Technical approval	ETA - 06 / 0076
Blow- in density	28-65 kg/m ³
Thermal conductivity	0,037 W / m ² *K
Water vapour diffusion resistance	μ = 3
Airflow resistance	r = 8,1 kPa. s / m ² at 30 kg / m ³ ; r = 46,3 kPa. s / m ² at 55 kg / m ³
Specific thermal capacity	2,11 kJ / kg K

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