GRAMITHERM®

Grass Insulating Swiss + Technology

SOLARIMPULSE EFFICIENT SOLUTION OCTOBER 2019

INSULATION BOARDS PRODUCED FROM MEADOW GRASS

- Excellent thermal efficiency (λd = 0,040W/m.K)
- Exceptional humidity regulator for home comfort
- Simple and quick installation
- Non-toxic, non-irritating
- 100% recyclable materials

Negative carbon footprint

"1 kg of Gramitherm batt absorbs 1,5 kg of CO_2 equivalent"

A VERSATILE MATERIAL FOR HOME COMFORT

Gramitherm® is a patented Swiss process that enables the production of the next generation of natural insulation boards from meadow grass fibres.

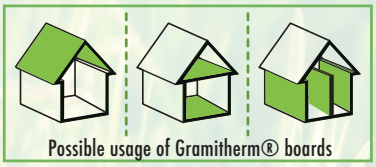
This product excels in offering both insulation against the cold of winter as well as summer heat. Its fibrous structure also absorbs noise efficiently.

The fibres are treated with a natural solution to achieve fire retardancy and anti-fungal properties. During the processing, the organic compounds are removed from the fibres, therefore there is nothing in the product to cause allergies or irritation, and no attraction to rodents.

Gramitherm® is the first 100% clean insulation material and exhibits the best ecological balance in its category! Wherever grass grows, Gramitherm® is a viable insulation solution.

www.gramitherm.ch / info@gramitherm.ch

GRASS FIBRE, A REMARKABLE MATERIAL



Thermal insulation
The thermal conductivity measured in standard conditions is 0.036-0.039W/m.K placing Gramitherm® in the category certified by SIA, at 0.040W/m.K.

Insulation against summer heat
Protection against summer heat becomes increasingly important for the well-being within a building. Construction materials can insulate against heat according to the specific thermal capacity. The value of Gramitherm® is certified at 1700J/ kgK, which is significantly better than conventional products. This results in cooler house temperatures during oppressive heat, even in attics.

Fungal resistance
According to the EU ISO standard 846, Gramitherm® is certified to resist fungal decay.

Fire resistance
Gramitherm® is non-combustible nor does it release toxic fumes. Classification according to Swiss standard = 5.3 (certified by the AEAI); Euroclass E (EN 13501-1); B2 according to DIN 4102-1..

Allergies
Gramitherm® does not contain grass pollen because it is cut before the flowering stage. Additionally, fine particles are extracted during the fabrication process. Gramitherm® does not contain any fungal spores and can be comfortably used by people with allergies.

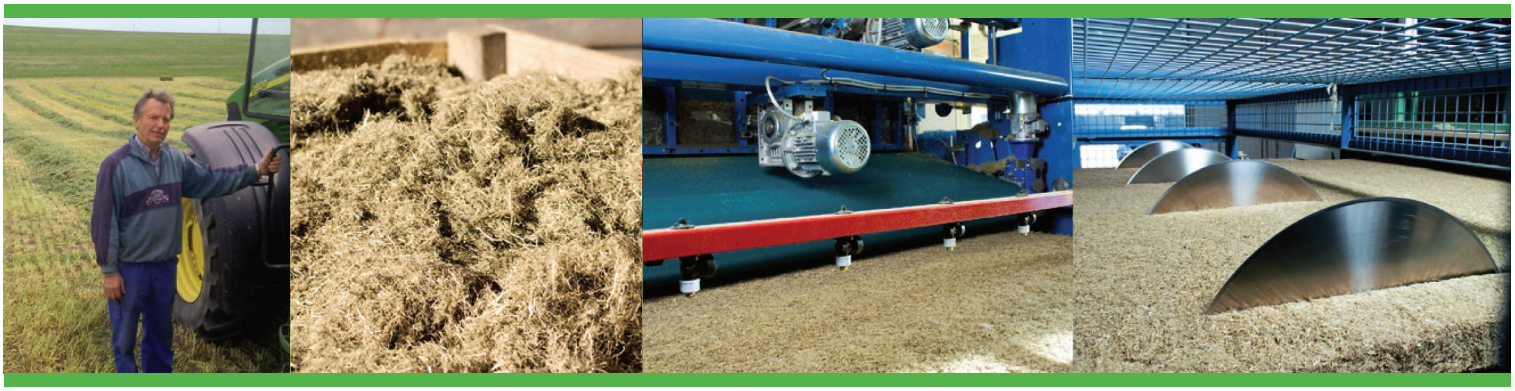
Sound absorption
Tests on current products with a 40kg/m3 density have been carried out. The degree of sound absorption (Alpha w) is 0,99 at 1000 Hz frequency. Based on these values calculated by Ecole Ingénieurs YVERDON (CH), Gramitherm is in the highest class and brings real home comfort, especially with timber frame houses.

Humidity control
Gramitherm® is able to absorb moisture from ambient air and to release it if the air becomes drier. This characteristic has a regulatory effect on room climate.

Dimensional stability
In accordance with the EU-1604 standard, the changes of length and width during the life of the product are +/-1%.

Rodent damage
While all types of insulation should be installed in accordance with local building practices, resulting in physical barriers to rodents and vermin, Gramitherm has no digestible (organic) content and has no attraction to rodents.

Gramitherm® obtained the European Technical Approval and all the approvals necessary for its use in Switzerland.



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RESOURCE OPTIMISATION AND ENERGY EFFICIENCY

One hectare of grassland enables the production of about 200m³ of Gramitherm® after treatment and separation of the digestible material. In order to supply 100% of the insulation market in Switzerland, a grass production area of 15.000 ha or approximately 2% of the country's grassland would suffice. The digestible components of the grass are dissociated in order to be used for the production of biogas or for food, especially for pigs. Every component is utilised, there is no waste. A life-cycle analysis has confirmed the comparative benefits of Gramitherm® regarding grey energy, emission of greenhouse gases and environmental impact. Thanks to the absorption of atmospheric CO_2 during the growth of the grass, Gramitherm® actually contributes to the reduction of the greenhouse effect.

Environment

Product type	Gramitherm	Cork	Glass wool	Styrofoam
Grey energy (MJ/kg)	18.5	25	44.7	105
Potential climate warming (kg CO_2/kg)	-1.405*	1.27	1.47	7.36

* "Zurich University / Departement ZH AW / 2015"

Health

Gramitherm® offers real advantages from a health perspective compared to other insulators: Its handling during the installation does not cause skin or respiratory irritations. It does not cause degassing of harmful products nor emit toxic fumes in the advent of fire.

Applications

Gramitherm® has demonstrated its qualities in the areas of new construction and renovation, of individual homes, public and commercial buildings. The main application areas are under roofs and between the rafters, for doubling of exterior walls and interior partitions, as a complement to a timber frame, as well as the insulation of floors and ceilings.

For application and setup examples, watch the Gramitherm video:
www.gramitherm.ch
(Section: "Installation")

APPLICATIONS UNDER THE ROOF

Gramitherm® is flexible and easy to embed between the rafters in cathedral ceilings. It is often installed in two or three layers: between, upon and underneath the rafters. For the finishing, a moisture seal is placed, before the final decorative wall covering is fixed.

DRY CONSTRUCTION SYSTEMS

Thanks to the noise absorption and the moisture regulation Gramitherm® is very practical for the separation of office and living rooms. For dry interior constructions, plasterboards are fixed on both sides of the insulation.

Insulate naturally with Gramitherm®

School, Grand-Saconnex (GE)

Townhall, Orbe (VD)

Administrative building, Yverdon (VD)

Family house, Court (JU)

GRAMITHERM®
Grass Insulating Swiss Technology

GRAMITHERM®

Benefits:

-Flexible insulation with fibres extracted from meadow grass

-Multiple applications for construction and renovation

-Protects efficiently from the winter cold and from summer heat

-Assists in sound insulation

-Negative carbon footprint

Technical data

Specs	Unit	Values										
European Technical Approval		ETA-06/0274										
Density	kg/m³	40										
Thermal conductivity	W/m.K	0.040										
Specific heatb	J/kgK	1700										
Diffusion resistance factor	μ	1										
Fire index		AEAI : 5.3 EUROCLASS : E										
Thickness tolerance class		T2										
Dimensional stability		max. variation +/- 1%										
Fungal resistance		no growth according to DIN IEC 68-2-10										
Raw material		prairie grass fibres (+/-70%), jute fibres (+/-20%) and binder fibres (+/-10%)										
Board dim.	mm	1200 X 600										
Thickness	mm	45	60	80	100	120	140	150	160	180	200	220	240
R (thermal resistance)		1,12	1,50	2,00	2,50	3,00	3,50	3,75	4,00	4,50	5,00	5,50	6,00
U (heat transmission)		0,89	0,67	0,50	0,40	0,33	0,28	0,27	0,25	0,22	0,20	0,18	0,17

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