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**Ribbed slab foundation with
continuous insulation for underfloor
heating and cooling systems**

KEY:



Thermal insulation



Respect for the environment



Ecological, environmentally friendly



Energy savings



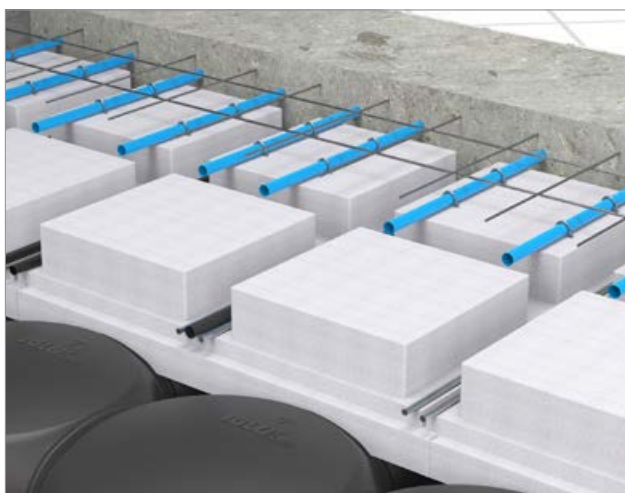
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Efficient thermal insulation must be able to keep heat inside buildings during the winter and protect against solar heat in the summer.

To reduce the thermal flow between two spaces at different temperatures and improve the energy performance of buildings: create a building envelope with low thermal transmittance, use insulating materials, avoid thermal bridges, check airtightness and adjust ventilation.

For these reasons, combined use of Iglu[®] Plus and Iso Iglu[®] is the ideal solution for efficiently insulating buildings from external agents such as humidity, heat and the cold, thereby increasing its useful life and also its value.

Using an Iso Iglu[®] panel in EPS, together with a ventilated underfloor cavity made with Iglu[®] Plus formworks, a ribbed slab foundation is created in reinforced concrete which rests along the edges of the perimeter structure of the building (walls and foundations), insulated on the intrados and free from thermal bridges.

Above, Iso Iglu[®] is preformed with channels or cavities for the pipe coils of the underfloor heating and cooling system, making them quick and easy to lay.



Advantages

- Iglu® Plus can be rested directly on the levelled soil, without needing to cast any lean concrete.
- It is easy to lay as Iglu® Plus is light and simple to interlock together.
- Pedestrian access is possible during casting.
- Systems can transit inside the preset orthogonal channels in the top part of the EPS panels, which will then be buried in the reinforced concrete slab foundation.
- A continuous hollow cavity is created under the flooring.
- The risk of breakage caused by deformation of the terrain (for example swelling clays) is eliminated, thanks to the continuous hollow cavity with supports only around the edge.
- No thermal bridges.
- Thanks to the vapour barrier formed by Iglu® Plus, it provides an alternative to traditional insulation.
- It saves time, thanks to the reduced amount of work compared with that needed to build a traditional underfloor cavity.
- A monolithic slab foundation insulated on the intrados is created.
- It reduces the subsequent superstructures to protect the insulation, with the option of applying the flooring directly onto the smooth surface of the concrete slab foundation: this saves a great deal of work and resources.
- It reduces the thickness of the top finishing foundation, thanks to the option of using the orthogonal channels preset in the EPS panel for the reinforcement, thereby obtaining a ribbed slab foundation.

Applications

Iso Iglu® is ideal for insulating the ground floor of residential, executive and commercial buildings.

It is recommended where there is an underfloor heating and cooling system, as the insulation is positioned towards the outside, while the mass of the finishing slab foundation is inside and serves as an energy accumulator, helping the system to keep the internal room temperature constant.

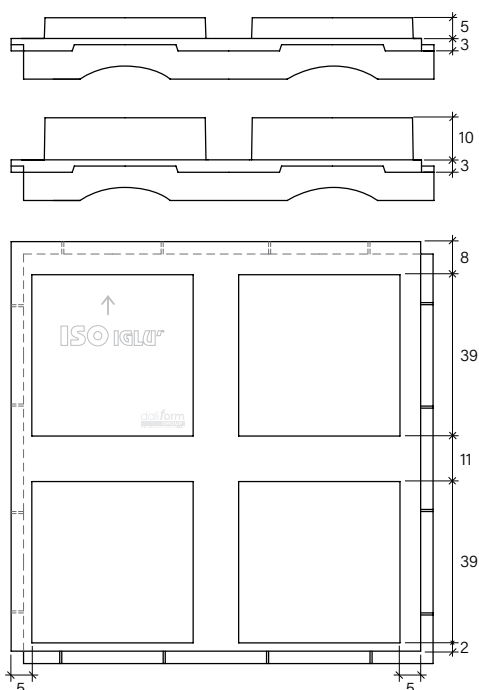
In this way, there are no thermal spikes and the radiant temperature is constant, guaranteeing a greater sense of comfort.

Technical data

Iso Iglu® is a panel measuring a standard 100 x 100 cm in EPS, shaped at the base and structured above with intersecting ribbing. It is ideal for positioning underfloor heating and/or cooling system pipes.

Iso Iglu® comes in two versions with different channel depths of either 5 cm or 10 cm. The density of the EPS can vary according to use; as standard, material with a density of 20 kg/m³ is used.

Table 1 shows the characteristics of the different types of EPS available.

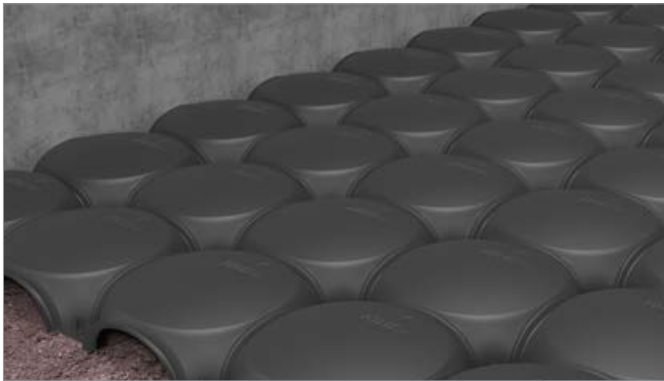


		THICKNESS 3 + 5	THICKNESS 3 + 10
Working dimensions	cm	100 x 100	100 x 100
Thickness	cm	3 + 5	3 + 10
Density	kg./m³	20	20
Weight of the piece	kg./pc.	1,25	1,70
Pallet units	pc./PAL	16	12
Pallet size	cm	100 x 110 x 255 h	100 x 110 x 255 h
Pallet weight	kg./PAL	35	35

Available EPS characteristics - Table 1

Type	Density	Compressive strength	Thermal conductivity	Fire-resistance	Flexural strength
	Kg/m³	kPa	W/mk	E	
EPS 80	14 - 16	80	0,037	E	BS 125
EPS 100	16 - 18	100	0,035	E	BS 170
EPS 120	18 - 20	120	0,034	E	BS 170
EPS 150	23 - 25	150	0,033	E	BS 250

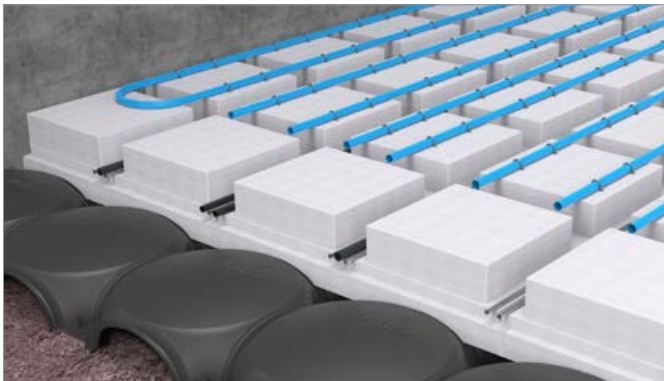
Laying



- 1 Prepare the surface by compacting the soil substrate. Lay the interlocking male/female formworks directly on the ground, from left to right and top to bottom, ensuring that the pre-printed arrow on the Iglu Plus cap is facing upwards.



- 2 Lay the Iso Iglu panels in EPS, taking care to position them so that the intrados shaping of the Iso Iglu matches up perfectly with the extrados of the Iglu Plus domes.

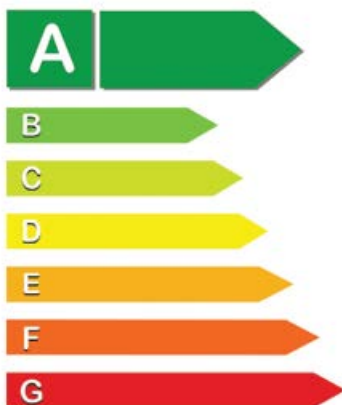


- 3 Lay any pipe coils for the underfloor heating and cooling system, fastening them to the Iso Iglu panels using the relevant clips for radiant underfloor heating systems. Any other system pipes can be inserted inside the orthogonal channels.



- 4 Lay the finishing slab foundation reinforcements and the reinforcements inside the ribbing. Then, cast the concrete in the ribbed slab foundation which should be well beaten down (especially along the sides and in the corners), compacted across its full thickness, supported and trowelled (by hand or using a trowelling machine) to a professional standard. After waiting for the concrete to mature, lay the flooring as per the design.

Energy savings



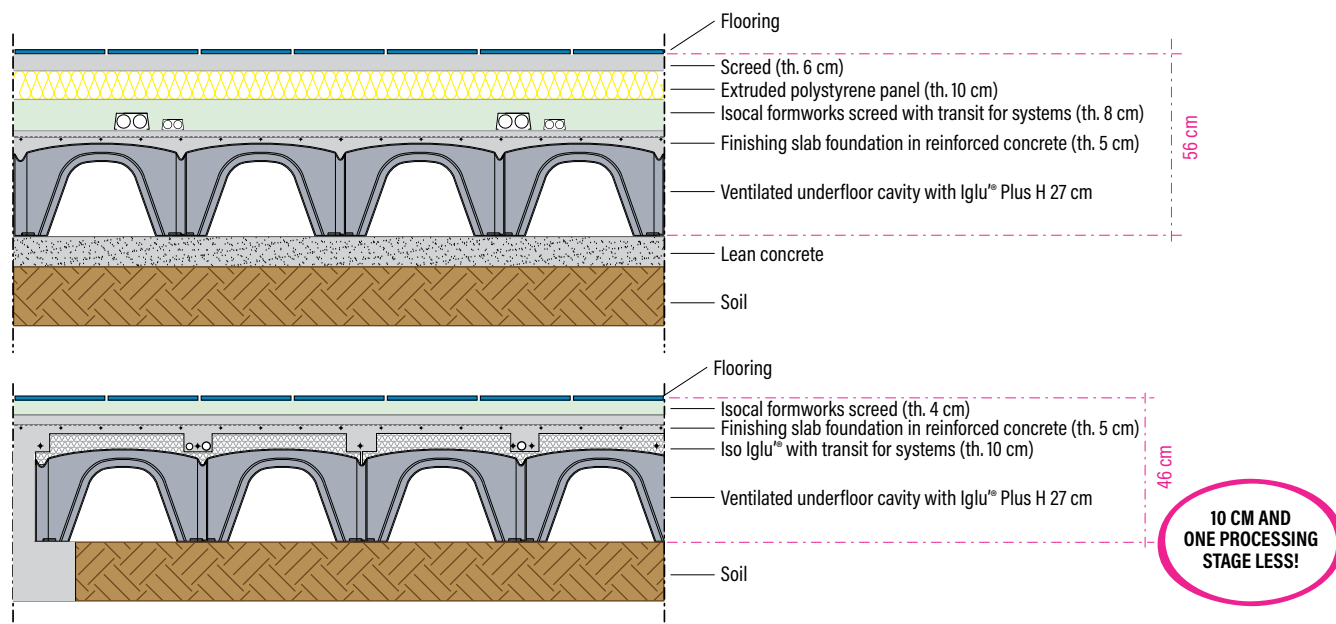
According to Italian Legislative Decree no. 311, integrated and modified by Italian Presidential Decree no. 59 of 2009, transmittance in "correct" thermal bridges should not exceed the transmittance in the current wall by 15%.

Thermal bridges are in fact among the main causes of losses of heat in buildings, as, given that they favour heat exchange between the outside and the inside, they are capable of tripling the heat transmission in a section of a building, even though they only represent a small part of the surface itself. This is why thermal bridges can significantly reduce the levels of comfort and hygiene in buildings owing to condensation forming on the inside, damp marks etc., and, consequently, they can also caused structural damage. One of the most delicate areas in this regard is the join where the wall meets the floor in correspondence with the foundation structure.

Using Iglu Plus and Iso Iglu together allows you to create a floor with crawlspace and insulated flooring that respect the legal requirements and are able to reduce heat dispersion; effectively insulate from external agents such as humidity, heat and the cold; obtain high levels of living comfort; and increase the useful life and value of the building. Furthermore, the vapour barrier formed by Iglu Plus is a valid and cheap alternative to traditional systems for hygrometric control of a building in the flooring against the ground.

Comparison between a ventilated underfloor cavity with Iso Iglu[®] and a traditional underfloor cavity H 27 cm

The benefits are the same for underfloor heating too.



Specifications

Construction of the ribbed foundation for a total height of _____ cm, by supplying and laying the Daliform Group's Iglu[®] Plus recycled plastic formworks for the rapid, dry formation of a self-supporting pedestrian platform, above which to lay Iso Iglu[®] panels in EPS for insulation.

Iglu[®] Plus formworks must be 50 x 50 cm (between centres) and _____ cm in height, have a convex form, rest solely on the four lateral feet to guarantee maximum ventilation and facilitate the passage of utilities, and have a dry breaking resistance of 150 kg in the central part of the arch summit, by means of an 8 x 8 cm pressure plate.

Iso Iglu[®] panels in EPS must be 100 x 100 cm (between centres) and 8 (or 10) cm in height, and must have a concave base at the intrados to ensure that they can be positioned stably on top of the Iglu[®] Plus formworks in recycled plastic to form a ribbed slab foundation, resting on the edge and insulated at the intrados.

The Iglu[®] Plus recycled plastic formwork must be made of "ALAPLEN" CP30", must not release polluting substances, must be accompanied by an Environmental Compatibility Certificate, and must be produced by a Company Certified according to the following international standards: UNI EN ISO 9001 (Quality), UNI EN ISO 14001 (Environment); BSI OHSAS 18001 (Safety); and SA 8000 (Social Accountability).

The company supplying the Iglu[®] Plus formworks and Iso Iglu[®] panels in EPS must also exhibit the product certificate approved by an EOTA (European Organisation for Technical Approvals) member agency.

Price €: _____ /m² _____

Daliform Group technical office



FEASIBILITY STUDY

Predimensioning and optimisation of the structures, comparative and/or revised proposals, material and manpower estimates, cost analysis.

Evaluation of forced ventilation in the case of cold rooms.

CALCULATION REPORT

Reports certifying the execution of Daliform Group constructive systems.

SUPPORT FOR THE EXECUTIVE DESIGN

Support by design professionals. Upon request, the formwork positioning plan can be supplied with a list of the products required to carry out the work and the relative accessories.

ON-SITE SUPPORT

If necessary, our technical staff can be present on-site to help the construction company during the operational phase.

The technical consultancy is only valid for the Daliform Group construction systems.

To contact the technical office: Tel. +39 0422 2083 - tecnico@daliform.com

To obtain updated technical cards, support material, new photos and case studies, go to www.daliform.com



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Certified Management System UNI EN ISO 9001,
UNI EN ISO 14001, UNI EN ISO 45001, SA 8000

Partner of
GBC Italia

Rating di legalità: ★★+