

IGLÙ[®]

www.daliform.com



**Permanent formwork for
ventilated crawl spaces**



KEY:



Water, collection tanks



Air, moisture



Radon



Cold rooms



Utility passage



Foundations



Certifications



SWITCHBOARD

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IGLÙ®

Iglù® is a market leading product that was created and patented for the realisation of sanitary spaces, ventilated cavities, under-floor cavities, ventilated floors and roofs during the construction and restructuring of civil and industrial buildings. This result of an ingenious idea dating back to 1993 considerably improved building methods. The innovative capacity of Iglù® has received numerous successes and recognitions on a national and international level, quickly confirming it as a product of excellence in the building world.

The modular, plastic Iglù® formworks, placed side by side in sequence according to a predefined direction, make it easy to quickly create a self-supporting pedestrian platform above which a layer of concrete is cast in order to easily and economically create a ventilated slab placed on vertical supports with the below cavity area available for the passage of systems but above all ventilated to counteract rising humidity and radioactive gases.

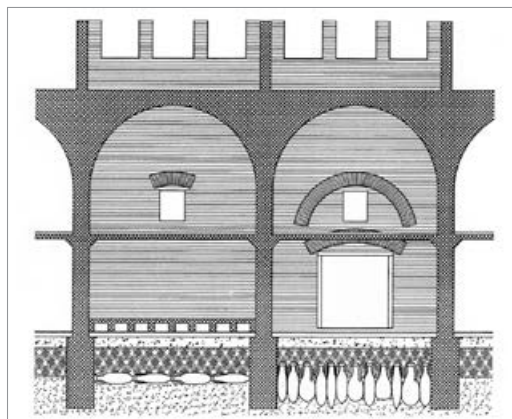


The problem for buildings: rising moisture

The problem of rising moisture from the ground and its results on the integrity of the structures and the healthiness of the inner rooms has been well known since antique Rome.

At those times, the under-floor cavities were created by raising the floor a few centimetres using amphoras or low walls. This created a cavity that was connected to the outside with ventilation inlets in order to guarantee ventilation (so-called ventilated wall cavity). This formed the basis for what is today commonly called a "sanitary space".

The Roman technique has influenced, if not inspired, technicians and designers in all times who have been able to diligently apply this constructive solution, recommending it and applying it to new builds and reconstruction projections.



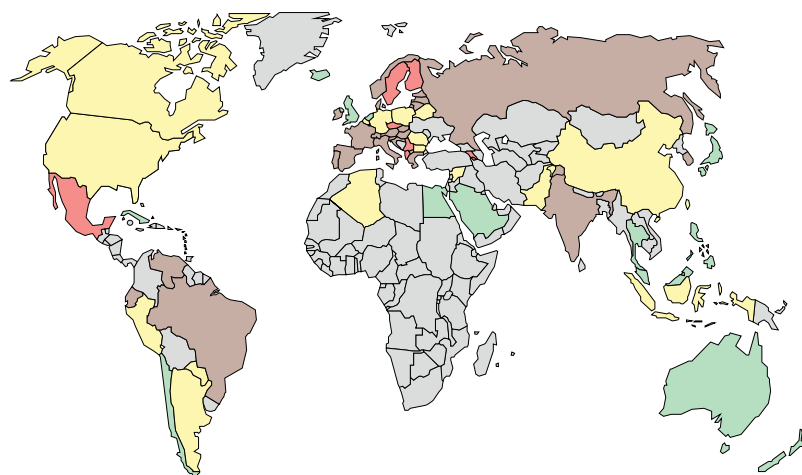
Example of a ventilated foundation in Roman times.



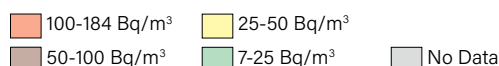
Danger of Radon gas and rising humidity in a home built on a traditional foundation.

Daliform Group with Iglù[®], one of its creations par excellence, has revolutionised building under-floor cavities to finally eliminate this problem through the availability of new materials. Today Iglù[®] makes the construction of under-floor cavities easy, economic and highly efficient as never before.

Problems with buildings: Radon gas



Gas Radon in the world



Radon is an odourless and colourless radioactive gas generated by a few terrestrial rocks caused by decay of uranium 238 and is able to emerge on the surface also at a distance very far from its origin. It easily infiltrates through cracks in the bottom levels of buildings: basements, cellars, etc. and represents a risk to our health.

As it is a radioactive gas, Radon can be carcinogenic if inhaled. As it is mainly released from the ground, if it is not dispersed outside it accumulates in closed rooms where it becomes dangerous. It is considered the second cause of lung tumours after smoking.

Our country and some areas in particular have large amounts of Radon and therefore there is the need for constructive solutions that account for the elimination of this radioactive gas.

The final solution: Iglù®

A ventilated under-floor cavity created with Iglù® represents an effective, quick and economic solution that makes it possible to send humidity and dangerous Radon gas to the atmosphere, which is beneficial to our health.

The air cavity formed by the Iglù® modules must be connected to the outside with simple pipes. This creates a natural air flow that crosses the cavity and eliminates moisture and Radon gas (if present).

The results of some ventilation tests (*carried out on our behalf by the University of Brno - Czech Republic - available on request*) indicate that the factor that has the greatest impact on the passage of air below the under-floor cavity is the presence of wind and its direction. The form of the Iglù® was designed to create minimum air resistance in the soffit of the modules.



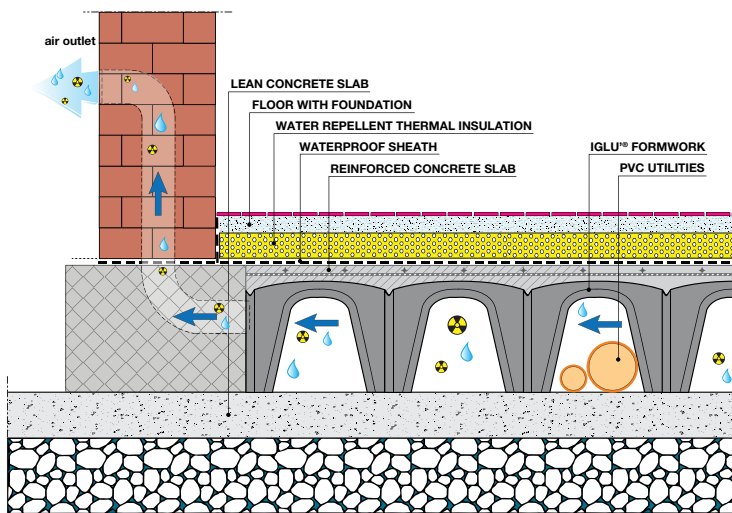
Internal view of the interspace formed with Iglu®



Home built with a ventilated IGLU® foundation.

To obtain a natural "chimney effect" position the inlet holes on the northern side at a height just off the ground and the outlet holes on the southern side at a higher point (preferably up to the roof), being careful to connect the various rooms of the foundation grid together so that the entire under-floor cavity is connected. The ducts positioned inside the wall with southern exposure will heat up, causing an upward motion intaking air from the under-floor cavity.

Sectional view of a ventilated under-floor cavity



The cavity is very large to the benefit of the insulation, ventilation and transit of technical and technological users.



Advantages

- Possibility to implement, in a single solution, foundation beams and the slab with the help of the *L-Plast* and *Beton Bridge* accessories.
- Reduction of manpower requirements by up to 80% in comparison to traditional systems.
- Drastic reduction in the use of concrete and aggregates as the arch form permits maximum resistance with a minimum thickness.
- Adaptable to non-standard spaces as the modules can be cut without underpinning.
- Ease of positioning due to lightness and simple linking of the modules.
- Simple adaptation to various perimeters.
- Quick and immediate cutting and shaping of the modules.
- Passage of the underground systems in every direction.
- Creation of a barrier against humidity.
- Tightness against rising humidity.
- Effective ventilation in all directions.
- Disposal of any RADON gas.
- No point of contact between the concrete and the ground.
- Perfect transpiration of the perimeter wall.



Example of the passage of utilities



Creation of ramps and gaps



Effective ventilation in all directions



Simple adaptation to various perimeters



Ease of positioning

Applications

Properly ventilated, the crawl space allows the elimination of rising damp and the conveyance of Radon gas, if present, into the atmosphere.

- Ventilated under-floor cavities for civil and industrial buildings that are being built new or reconstructed.
- Urban infrastructure structures: squares, sidewalks, sports facilities.
- Creation of an intermediate slab or roofing for cavities used for ventilation and the passage of systems.
- Rooms used for humidity and temperature control: drying cells, cold rooms, greenhouses, storage rooms and cellars.
- Underground pipes for the passage of utilities. Inspectionable cavities and pits.
- By filling it in simply with expanded clay, it can be used to create roof-top gardens.
- Underground ducts for the dispersion of water and for drainage.
- Overhead sidewalks for passenger loading and unloading or the creation of floating floors.
- Levelling height.



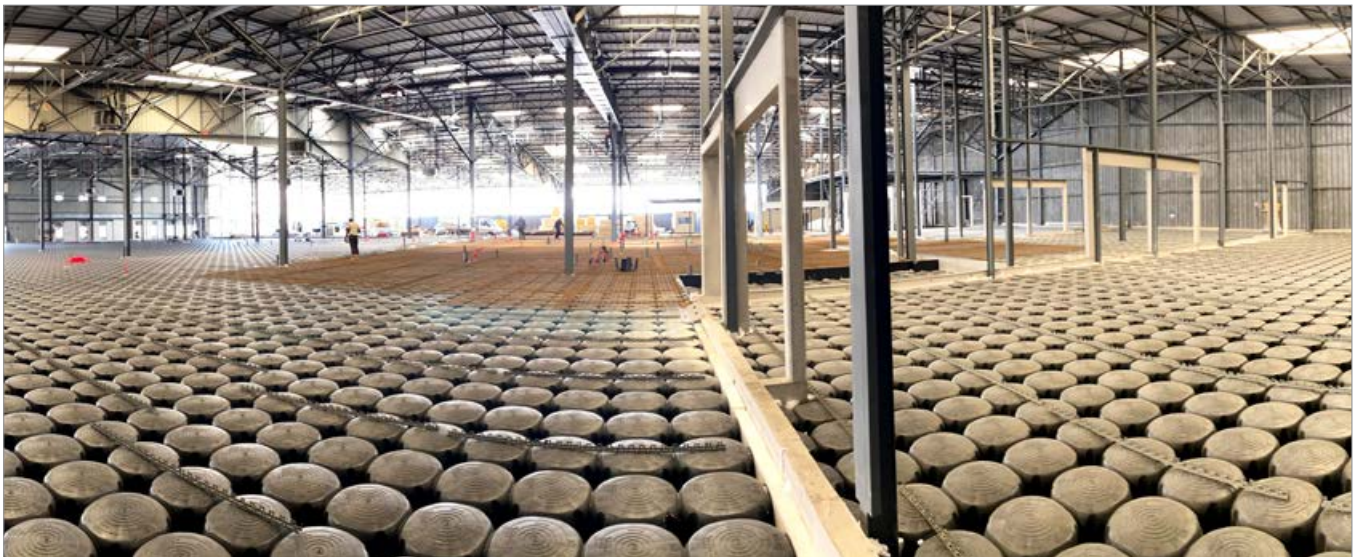
Parking for a shopping center



Raising of intermediate floors for office building



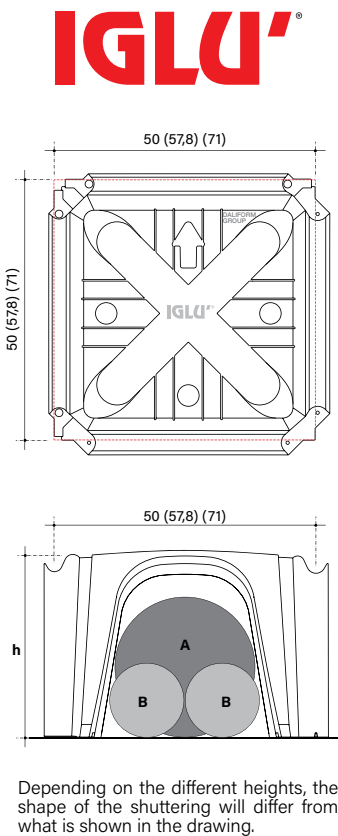
Renovation of a hospital building



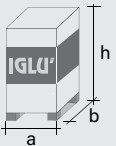


Ventilated interspace for industrial building










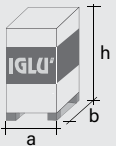
Range

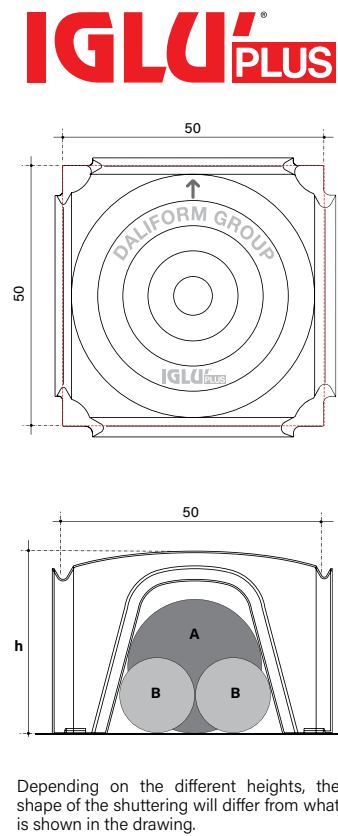
The material is waterproof and can therefore be stored outside.



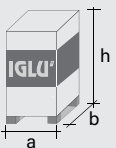


	H cm ►		
Working dimensions*	cm	50 x 50	58 x 58
Height h tunnel clearance	h cm	2,2	-
Max pipe diameter A	1 x Ø cm	2,2	-
Max pipe diameter B	2 x Ø cm	2,2	-
Quantity of concrete to the crown**	m³/m²	0,006	0,014
Weight of each unit	kg	0,735	1,136
 Pallet dimensions	a x b x h	110 x 110 x 250	120 x 120 x 256
	kg	454	1.104
	Units	600	960
	m²	150	320
L-Plast panels	H cm	-	-
	L cm	-	-
	D cm	-	-










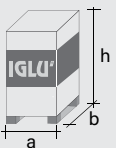
* Recyclable material is allowed a size tolerance of ± 1,5%.
** The volume may vary depending on the pouring condition and the tolerance of the material.


									
	6	8	9	10	12	13	14	16	18
Working dimensions*	50 x 50	50 x 50	58 x 58	50 x 50	50 x 50	50 x 50	50 x 50	50 x 50	50 x 50
Height h tunnel clearance	3,9	5,9	-	5,8	7,7	-	9,8	11,8	13,8
Max pipe diameter A	3,9	5,9	-	5,8	7,7	-	9,8	11,8	13,8
Max pipe diameter B	3,9	5,9	-	5,5	7,5	-	9,4	11	12,5
Quantity of concrete to the crown**	0,007	0,010	0,018	0,833	0,021	0,021	0,028	0,030	0,033
Weight of each unit	0,757	0,789	1,190	1,200	0,865	1,287	0,963	0,984	1,179
 Pallet dimensions	110 x 110 x 253	110 x 110 x 254	120 x 120 x 262	110 x 110 x 246	110 x 110 x 249	110 x 110 x 256	110 x 110 x 248	110 x 110 x 250	110 x 110 x 250
	467	487	1.199	496	515	554	456	466	461
	600	600	996	580	580	420	460	460	380
	150	150	332	145	145	105	115	115	95
L-Plast panels	-	12	12	12	12	12	12	14	18
	-	205	205	205	205	205	205	205	205
	-	8	8	8	8	8	8	7	7




	H cm ►		
Working dimensions*	cm	50x50	50x50
Height h tunnel clearance	h cm	3	4,5
Max pipe diameter A	1 x Ø cm	3	4,5
Max pipe diameter B	2 x Ø cm	3	4,5
Quantity of concrete to the crown**	m³/m²	0,004	0,012
Weight of each unit	kg	0,865	1,460
 Pallet dimensions	a x b x h	110 x 110 x 108	110 x 110 x 210
	kg	359	597
	Units	400	400
	m²	100	100
L-Plast panels	H cm	-	12
	L cm	-	205
	D cm	-	8

* Recyclable material is allowed a size tolerance of ± 1,5%.
** The volume may vary depending on the pouring condition and the tolerance of the material.

									
	12	16	20	27	35	40	45	50	55
Working dimensions*	50x50	50x50	50x50	50x50	50x50	50x50	50x50	50x50	50x50
Height h tunnel clearance	8	11	13	21	29	34	39	43	44
Max pipe diameter A	8	11	13	21	25,5	27,5	27	26,5	25,5
Max pipe diameter B	8	9,5	10	16	14,5	15	14,5	14	13,5
Quantity of concrete to the crown**	0,016	0,034	0,035	0,040	0,056	0,060	0,065	0,067	0,090
Weight of each unit	1,334	1,536	1,482	1,720	2,044	2,131	2,239	2,185	2,823
 Pallet dimensions	110 x 110 x 226	110 x 110 x 244	110 x 110 x 234	110 x 110 x 246	110 x 110 x 231	110 x 110 x 230	110 x 110 x 236	110 x 110 x 236	110 x 110 x 243
	546	474	457	529	626	652	685	668	860
	400	300	300	300	300	300	300	300	300
	100	75	75	75	75	75	75	75	75
L-Plast panels	12	14	18	25	33,5	33,5	33,5	49	49
	205	205	205	205	205	205	205	205	205
	8	7	7	7	16,5	16,5	16,5	7	7



20	22	25	27	27	30	35	40	45
50 x 50	50 x 50	50 x 50	50 x 50	57,8 x57,8	50 x 50	50 x 50	50 x 50	50 x 50
15,8	17,8	20,5	-	22,5	26,3	31,3	36,3	41,3
15,8	17,8	20,5	-	22,5	25	26,5	28,5	29,5
13,5	15	15	-	16,8	13	14,5	15	16
0,034	0,036	0,039	0,031	0,043	0,046	0,052	0,058	0,064
1,038	1,265	1,330	1,952	1,687	1,406	1,492	1,557	1,622
110 x 110 x 251	110 x 110 x 256	110 x 110 x 254	110 x 110 x 259	120 x 120 x 249	110 x 110 x 243	110 x 110 x 248	110 x 110 x 253	110 x 110 x 247
491	494	545	950	561	463	491	511	500
460	380	400	480	324	320	320	320	300
115	95	100	120	108	80	80	80	75
18	23	23	23	25	23	33,5	33,5	33,5
205	205	205	205	205	205	205	205	205
7	12	12	12	7	12	16,5	16,5	16,5



50	55	60	65	70	75	80
57,8 x 57,8	57,8 x 57,8	57,8 x 57,8	71 x 71	71 x 71	71 x 71	71 x 71
45,5	50,4	55,4	60,7	65,7	70,7	75,7
30,8	32,2	33,6	45	45	45	45
16,6	17,3	18,1	25	25	25	25
0,077	0,080	0,083	0,112	0,114	0,117	0,118
2,552	2,693	2,801	4,261	4,402	4,661	4,867
120 x 120 x 261	120 x 120 x 248	77 x 155 x 246	77 x 155 x 246	77 x 155 x 244	77 x 155 x 244	77 x 155 x 248
627	628	653	527	527	547	551
240	228	228	120	116	114	110
80	76	76	60	58	56	55
49	54	54	64	64	74	74
205	205	205	205	205	205	205
7	12	12	15	15	15	15

Hypothesis of ULS calculation based on Iglu’® PLUS H 27 cm

The table shows, starting from a uniformly distributed load's hypothesis, the minimum thickness of the slab, the type of reinforcement and the pressure on the ground, according to the type of lean concrete (using the IGLU’® PLUS H 27 cm).
For the dimensioning of all different heights, please see the technical data sheets.

Hypothesis of load (kg/m²)	Slab thickness (cm)	Mesh Ø mm (mesh cm x cm)	Thickness of the lean concrete (cm)	Pressure at pillar base (kg/cm²)
2.200	3	Ø5 20 x 20	5	0,74
			10	0,27
			15	0,14
4.200	4	Ø6 25 x 25	5	1,34
			10	0,48
			15	0,25
6.500	5	Ø6 20 x 20	5	2,03
			10	0,72
			15	0,37
14.000	7	Ø8 20 x 20	10	1,51
			15	0,76
			20	0,46
25.000	10	Ø8 15 x 15	10	2,66
			15	1,35
			20	0,81

Pressures at the bottom of the structure - Iglu’® PLUS

The table expresses, starting from the various examples of overload and of thickness, the pressures that would be applied to the feet of the structure, in relation to the thicknesses of the lean concrete.

Use	Loads* (kg/m²)	Slab thickness (cm)	Mesh Ø mm (cmxcm)	Thickness of the lean concrete (cm)	Pressure at pillar base (kg/cm²)										
					Iglu'® Plus H 4	Iglu'® Plus H 8	Iglu'® Plus H 12	Iglu'® Plus H 16	Iglu'® Plus H 20	Iglu'® Plus H 27	Iglu'® Plus H 35	Iglu'® Plus H 40	Iglu'® Plus H 45	Iglu'® Plus H 50	Iglu'® Plus H 55
Residences	400	4	Ø 5/25x25	0	1,650	0,780	0,940	0,940	1,110	1,500	1,110	1,230	1,510	1,520	1,810
				5	0,190	0,310	0,340	0,350	0,390	0,450	0,400	0,420	0,470	0,470	0,530
				10	0,080	0,180	0,190	0,200	0,210	0,240	0,220	0,230	0,250	0,250	0,270
Offices	600	4	Ø 5/25x25	0	2,290	1,080	1,280	1,260	1,490	2,000	1,460	1,610	1,960	1,970	2,310
				5	0,250	0,400	0,450	0,450	0,490	0,580	0,500	0,530	0,590	0,590	0,660
				10	0,100	0,220	0,240	0,250	0,260	0,290	0,270	0,280	0,300	0,300	0,330
Garages	1100	5	Ø 6/20x20	0	3,980	1,860	2,200	2,100	2,490	3,310	2,370	2,600	3,150	3,160	2,630
				5	0,410	0,650	0,720	0,710	0,780	0910	0,770	0,810	0,900	0,900	0,980
				10	0,150	0,350	0,370	0,370	0,390	0,440	0,390	0,410	0,440	0,440	0,470
Workshops	2100	6	Ø 6/20x20	0	7,290	3,370	3,980	3,740	4,430	5,880	4,150	4,550	5,480	5,490	6,190
				5	0,720	1,140	1,250	1,220	1,330	1,550	1,300	1,370	1,510	1,510	1,630
				10	0,260	0,580	0,620	0,610	0,650	0,720	0,640	0,670	0,720	0,720	0,760

* Accidental overloads in different environments as provided in Table 3.1.II NTC 2018 – Values of the workloads for the different categories of buildings.

Hypothesis of ULS calculation based on Iglu'® H 30 cm

The table shows, starting from a uniformly distributed load's hypothesis, the minimum thickness of the slab, the type of reinforcement and the pressure on the ground, according to the type of lean concrete (using the IGLU'® H 30 cm). For the dimensioning of all different heights, please see the technical data sheets.

Hypothesis of load (kg/m²)	Slab thickness (cm)	Mesh Ø mm (mesh cm x cm)	Thickness of the lean concrete (cm)	Pressure at pillar base (kg/cm²)
2.000	3	Ø5 20 x 20	5	0,57
			10	0,23
			15	0,12
4.000	4	Ø6 25 x 25	5	1,01
			10	0,42
			15	0,22
6.000	5	Ø6 20 x 20	5	1,60
			10	0,61
			15	0,32
13.000	7	Ø8 20 x 20	5	3,34
			10	1,21
			15	0,66
23.000	10	Ø8 15 x 15	5	2,20
			10	1,16
			15	0,71

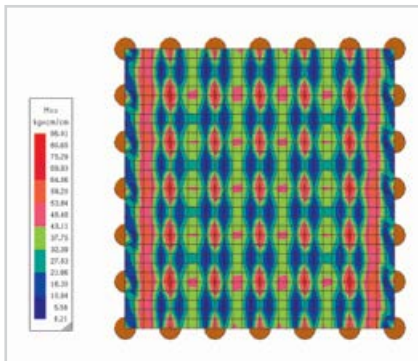
Pressures at the bottom of the structure - Iglu'®

The table expresses, starting from the various examples of overload and of thickness, the pressures that would be applied to the feet of the structure, in relation to the thicknesses of the lean concrete.

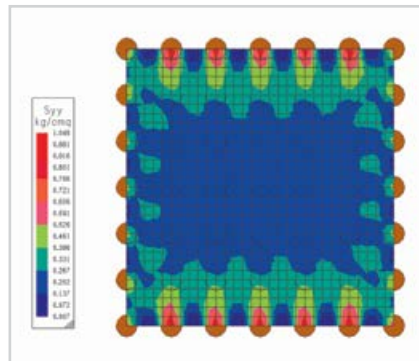
Use	Loads* (kg/m²)	Slab thickness (cm)	Mesh Ø mm (cmxcm)	Thickness of the lean concrete (cm)	Pressure at pillar base (kg/cm²)									
					Iglu'® H 4	Iglu'® H 5	Iglu'® H 6	Iglu'® H 8	Iglu'® H 9	Iglu'® H 10	Iglu'® H 12	Iglu'® H 13	Iglu'® H 14	Iglu'® H 16
Residences	400	4	Ø 5/25x25	0	1,160	0,440	1,310	1,570	0,960	0,151	1,920	0,620	0,930	0,980
				5	0,260	0,080	0,275	0,290	0,110	0,300	0,330	0,300	0,340	0,360
				10	0,126	0,038	0,130	0,136	0,045	0,138	0,150	0,190	0,190	0,200
Offices	600	4	Ø 5/25x25	0	1,630	0,600	1,830	2,120	1,300	2,080	2,610	0,840	1,250	1,320
				5	0,340	0,110	0,360	0,390	0,142	0,390	0,430	0,390	0,440	0,460
				10	0,160	0,047	0,165	0,170	0,057	0,170	0,185	0,230	0,240	0,250
Garages	1100	5	Ø 6/20x20	0	2,840	1,020	3,200	3,800	2,200	3,570	4,400	1,430	2,110	2,210
				5	0,560	0,170	0,590	0,630	0,230	0,620	0,680	0,620	0,700	0,730
				10	0,247	0,073	0,255	0,267	0,086	0,260	0,280	0,360	0,370	0,370
Workshops	2100	6	Ø 6/20x20	0	5,200	1,840	5,870	7,040	3,970	6,480	7,990	2,560	3,800	3,950
				5	0,980	0,300	1,030	1,160	0,390	1,080	1,180	1,070	1,220	1,250
				10	0,418	0,122	0,430	0,450	0,143	0,440	0,470	0,600	0,610	0,620

* Accidental overloads in different environments as provided in Table 3.1.II NTC 2018 - Values of the workloads for the different categories of buildings.

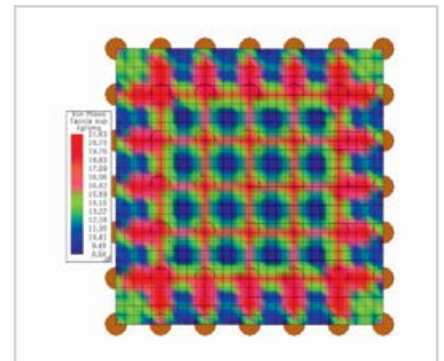
Graphic analysis of the behaviour of concrete structures



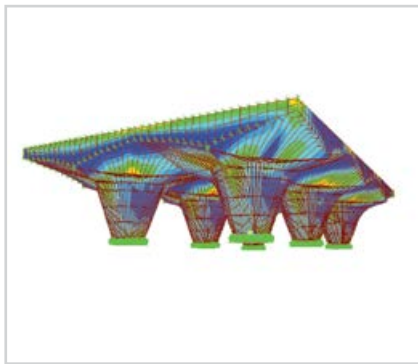
View of the extensional state of the Mxx slab



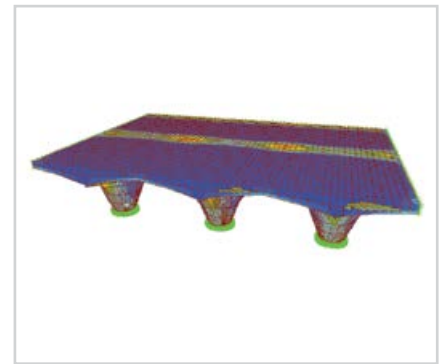
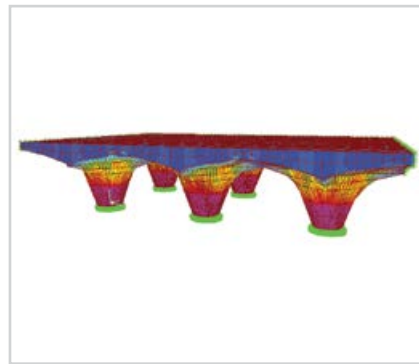
View of the extensional state of the Syy slab



View of the Ideal Tension of the Von Mises Criterion slab



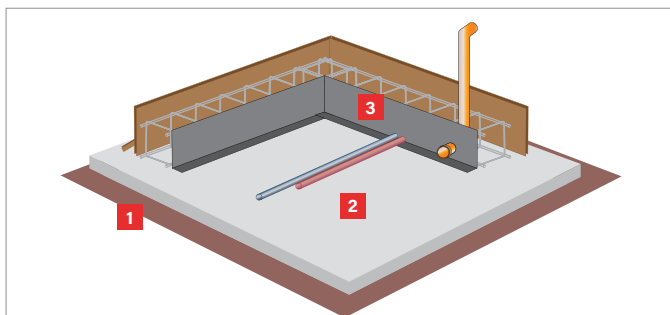
Views of the model subjected to structural analysis.



The overload hypotheses indicated are normally those laid down by law; the actual load capacity is far superior. To know the exact values or sizing as shown in the project, contact the technical department.

Pressure at pillar base (kg/cm ²)																
Iglu [®] H 18	Iglu [®] H 20	Iglu [®] H 22	Iglu [®] H 25	Iglu [®] H 27	Iglu [®] H 27	Iglu [®] H 30	Iglu [®] H 35	Iglu [®] H 40	Iglu [®] H 45	Iglu [®] H 50	Iglu [®] H 55	Iglu [®] H 60	Iglu [®] H 65	Iglu [®] H 70	Iglu [®] H 75	Iglu [®] H 80
1,070	1,140	1,230	1,230	1,700	0,740	0,960	1,110	1,320	1,590	1,650	1,920	2,190	3,300	3,300	3,300	3,300
0,380	0,390	0,410	0,420	0,560	0,340	0,360	0,390	0,430	0,480	0,570	0,620	0,670	0,990	0,990	1,000	1,000
0,210	0,210	0,220	0,220	0,300	0,210	0,200	0,220	0,230	0,250	0,310	0,325	0,340	0,480	0,490	0,490	0,490
1,440	1,530	1,640	1,730	2,250	0,980	1,270	1,460	1,730	2,070	2,130	2,470	2,810	4,100	4,110	4,130	4,150
0,480	0,500	0,520	0,540	0,710	0,430	0,460	0,500	0,550	0,600	0,710	0,770	0,830	1,210	1,210	1,220	1,220
0,260	0,260	0,270	0,280	0,370	0,260	0,250	0,265	0,280	0,300	0,377	0,398	0,420	0,590	0,590	0,600	0,600
2,400	2,560	2,740	2,870	3,710	1,560	2,090	2,380	2,810	3,330	3,380	3,900	4,430	6,210	6,230	6,250	6,270
0,760	0,790	0,820	0,840	1,110	0,670	0,710	0,770	0,840	0,920	1,080	1,160	1,250	1,800	1,800	1,810	1,810
0,390	0,400	0,410	0,420	0,550	0,380	0,370	0,400	0,420	0,450	0,550	0,580	0,610	0,860	0,860	0,870	0,870
4,230	4,560	4,870	5,100	6,560	2,800	3,700	4,190	4,910	5,790	5,830	6,720	7,600	10,300	10,300	10,400	10,400
1,310	1,350	1,400	1,430	1,890	1,140	1,210	1,300	1,420	1,550	1,800	1,940	2,070	2,950	2,960	2,960	2,970
0,640	0,660	0,670	0,690	0,910	0,630	0,610	0,640	0,680	0,730	0,890	0,940	0,980	1,390	1,400	1,400	1,400

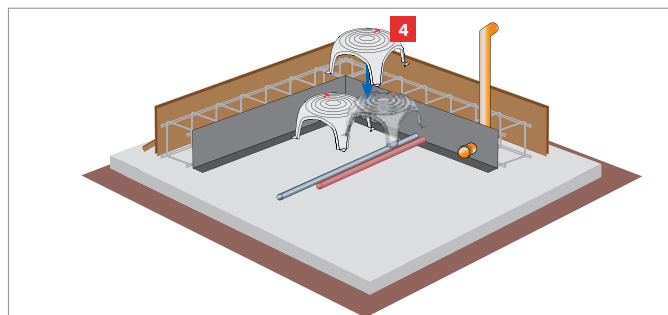
Method for creating under-floor cavities



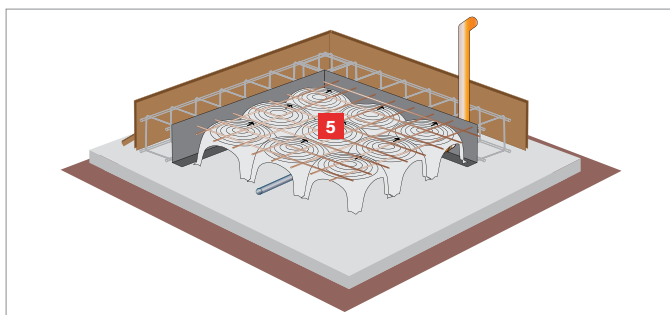
1 Preparation of the natural ground.

2 Preparation of the lean concrete foundation, to be sized according to the loads and capacity of the ground.

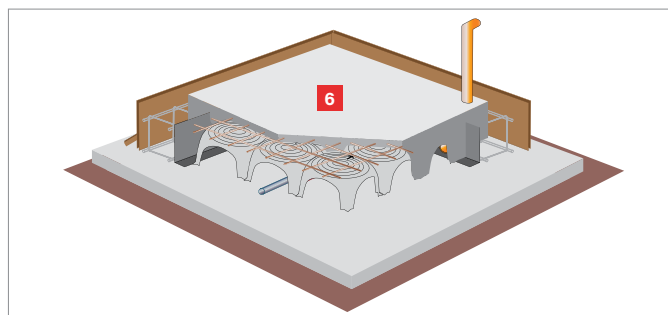
3 Positioning the L-Plast panel around the foundation beams after positioning the necessary reinforcements.



4 Positioning the linking male/female formworks, working from the left to the right, from the top down, making sure the arrow is facing upward.



5 Laying the welded mesh Ø 6 20x20 above the formworks.



6 Casting the concrete starting from the centre of the arc, letting it go inside the legs of the Iglü®.

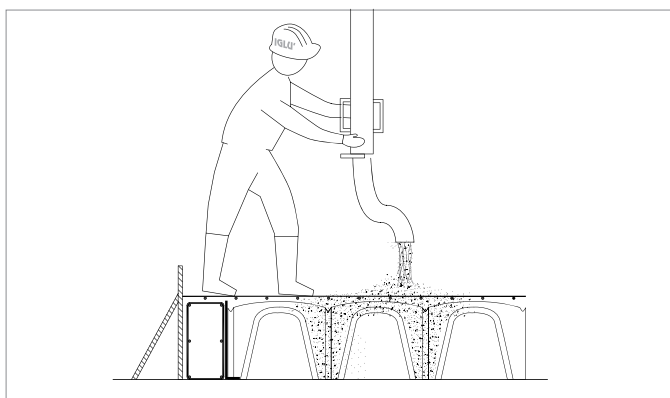


To ensure a correct installation and perfectly created under-floor cavity please refer to the product's usage requirements.

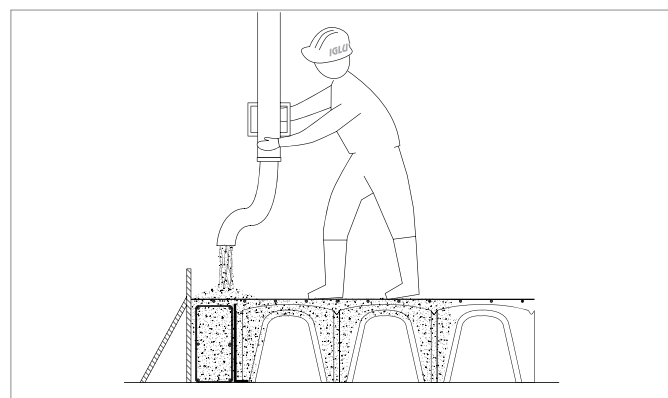


Detailed view of the complete sequence of positioning the Iglü®, subsequent reinforcement, casting and smoothing.

Casting method



1 Casting the concrete starting from the centre of the arc, letting it go inside the legs of the Iglü®.



2 Continue the casting filling all curbs and foundation beams.

Dry assembly method



Fig. 1 - Dry positioning of the first formwork, the arrow is facing the foundation curb.

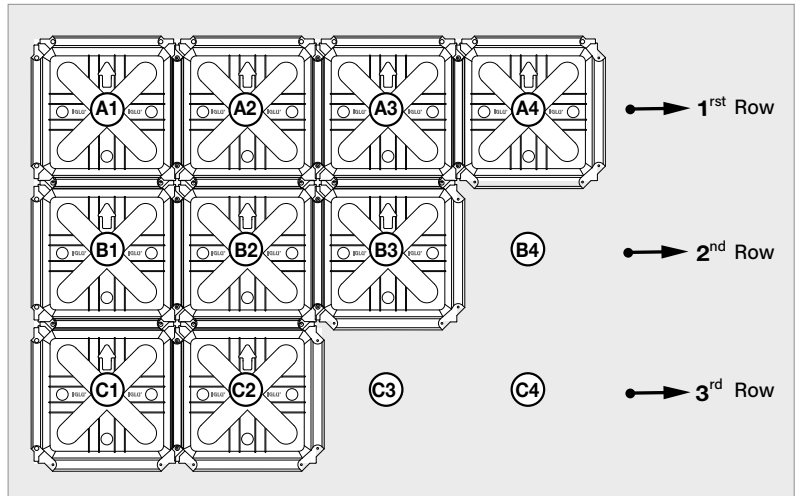


Fig. 2 - Dry positioning sequence of the modules by row.

- 1** Position the first element to the upper left with respect to the work surface, making sure that the arrow is pointing up (Fig. 1).
- 2** Unite the elements in sequence, by horizontal row, proceeding from the left towards the right and from the top downwards (following the direction normally used for writing), as shown graphically on the crown of each unit (Fig. 2).
- 3** To unite the units in sequence, be careful to perfectly link the "male-female" hooking elements at the base of the support feet (see photo sequence - Fig. 3).

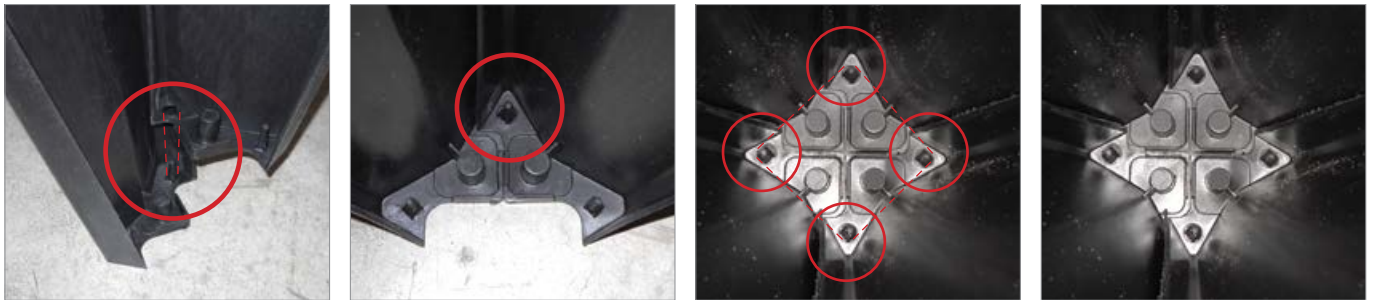


Fig. 3 - Detailed view of the male-female system linking phase - note the perfect seal of the feet.



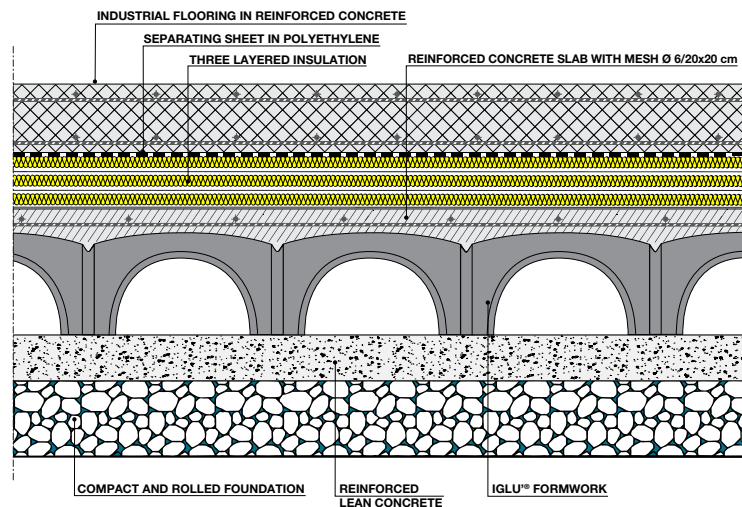
Application example: cold rooms



Cold rooms are used everywhere in the food industry for food storage. They are divided into low temperature (-4°C -30°C) and medium temperature (0°C $+4^{\circ}\text{C}$) rooms. A common problem associated with low temperature cold rooms is the possibility that the cold is transmitted through the structure, reaching the ground and bringing it to a temperature below zero. The water freezes and, increasing in volume, can lift the floor of the cold room, breaking it. To avoid this problem, in addition to an insulating layer it is also common to lift the floor off the ground and ventilate it in order to keep the temperature of the cavity above zero and eliminate the humidity in the foundation. To do so using natural ventilation, the under-floor cavity must be at least 20 cm high. The traditional system involves creating under-floor cavities with a series of pipes through which suitably heated fluid (air or other) is conducted.

Iglü® has numerous advantages, for example ventilation and is more effective because it creates a single open space under the floor and the air can circulate in all directions.

There are also economic advantages due to the ease of positioning and material savings.



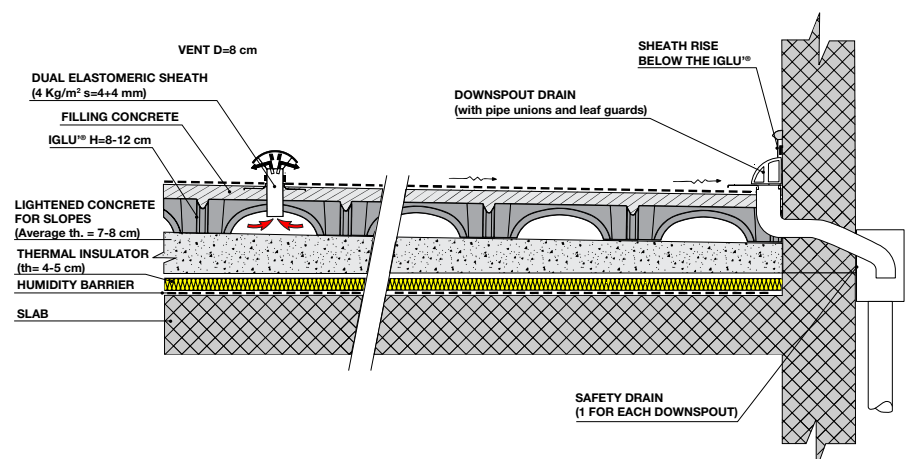
Application example: ventilated roof



An increasingly important topic over the past years has been the excessive amount of energy used by buildings, a use that can be considerably reduced through an intelligent variation in how Iglü® can be used: roof ventilation. By placing Iglü® formworks on the building's horizontal roof, an air cavity is created that insulates from the heat in the summer and from the cold in the winter, resulting in savings in indoor air conditioning. Tests have been performed on roof ventilation using Iglü®, in collaboration with the University of Malta, which have provided very valid results, combining a summer ventilation system with the closure of air inlets in winter, in order to create an insulating cavity.

Creation of a flat ventilated roof on an existing slab:

- Positioning of the humidity barrier.
- Positioning of the insulating layer.
- Creating the sloping screed.
- Positioning of the Iglü® formwork H 4, 8, 12 cm.
- Positioning of the welded mesh Ø 6 20x20.
- Creating the concrete screed above the Iglü® modules.
- Screed waterproofing.
- Creation of the finished floor.



Application example: anti-root cavities

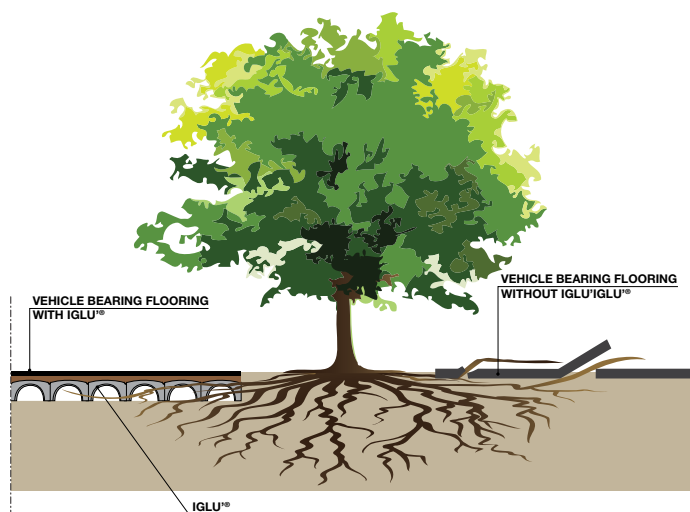


Urban greenery has become an indispensable aspect for improving the quality of life and making cities more vibrant and colourful. The idea to create a city garden was developed almost 200 years ago, and in Italy the trend is to create parks, urban woods and "green belts". Often, however, the green is simply inserted to the side of roads, on sidewalks or bicycle paths. Maintenance work must be carried out regularly as the tree roots lift up the pavement until breaking through and then going back underground, following a horizontal path. The Iglù® system can eliminate this problem.

By creating a cavity with Iglù® around the trees below road level, the tree is "deceived"; the roots, in fact, will reach the layer of air and then follow a horizontal path without breaking or damaging the overhead pavement.

Advantages:

- There are no maintenance costs for the sidewalk/bike path.
- Greater "satisfaction" for residents who will not have to complain about damaged pavements.
- Fewer accidents involving the elderly or people with limited motor skills.
- Levelling with great savings in inert material.



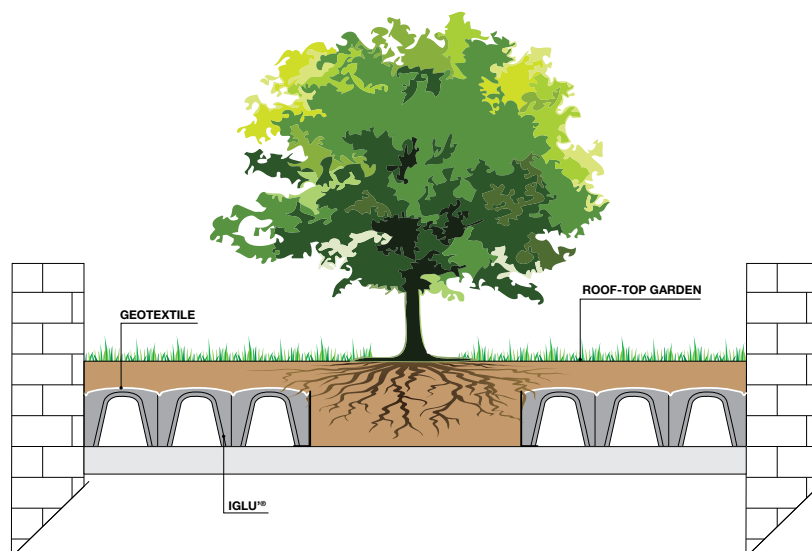
Application example: roof-top garden



A roof-top garden is the most successful solution against the continuous cementification of the territory. They have been used since ancient times, as demonstrated by the roof-top gardens of Babylon. Today, the techniques and materials for their creation have evolved and their use have become fundamentally important. Iglù® is ideal for creating roof-top gardens, making them safe to create without damaging waterproofing, solving the problem of the passage of systems and providing solutions for draining and ventilating green spaces, which are necessary for the garden. It also makes it possible to level the surface without burdening the structure.

Method for preparing a roof-top garden:

- Preparation of the support.
- Passing the systems.
- Positioning of the Iglù® modules.
- Filling with expanded clay or gravel.
- Laying of the geotextile.
- Filling with soil.

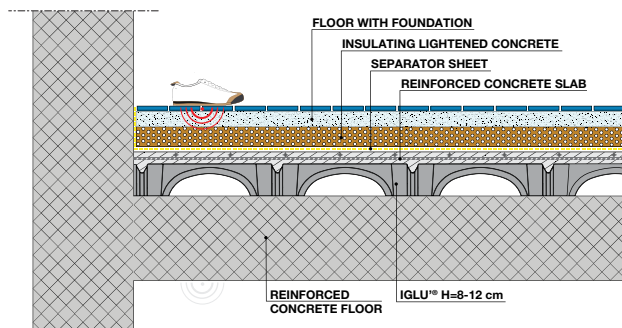
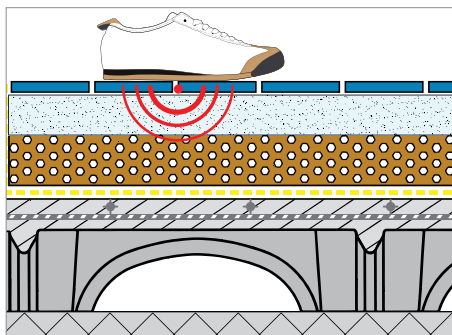


Acoustic insulation

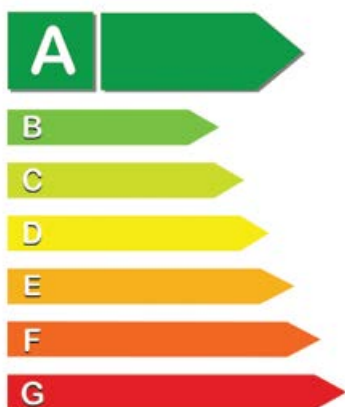


Law 447/95 foresees the protection against noise transmission in buildings, which can be done in particular through **acoustic floor insulation**. This can be implemented by creating horizontal structures of a suitable mass, placing layers of material between the floor and the screed that dampens the vibrations due to impact noise. Depending on the building's use, the law specifies the different phono insulation parameters. With the help of Iglù® H 4-8-12 cm, which is placed between the screed and the slab structure, a **noise control** mechanism is implemented that makes it possible to increase the level of comfort in homes, with the additional benefit of a cavity that is created through which cables and piping can be passed and is also a less heavy solution than the classical screed. In combination with specific phono insulating packages Iglù® helps reach the values specified by regulations in terms of noise.

The framework law on acoustic pollution no.447 dated 26/10/95 establishes the fundamental principles on protecting the outdoor environment and the residential environment from acoustic pollution.



Energy savings and respect for the environment



The topic of energy savings and environmental protection has become very important today; Trentino Alto Adige, with the CasaClima Agency and its energy certification has created a virtuous circle of sustainable architecture on a national level. A building's **energy certificate** can help evaluate its **energy efficiency** and **estimate consumption**, furthermore it is **mandatory** to display it when selling the property.

Daliform Group, which is **ahead of its time**, has carried out studies and tests for a heat recovery system using an under-floor cavity with Iglù® H. 12 cm, together with the University of Brno (*Czech Republic*), which led to interesting results thanks to which buildings can be built with a **high energy efficiency class** (*Class A, A+ and passive house*) making it possible to save energy for air conditioning, which is economic with an initial investment (see page 18).

Iglù® also contributes toward additional energy savings through the use of ventilated cavities on all flat roofs (see "ventilated roof").

From the onset, Daliform Group srl has been committed to environmental sustainability, a field in which it has obtained impressive results.

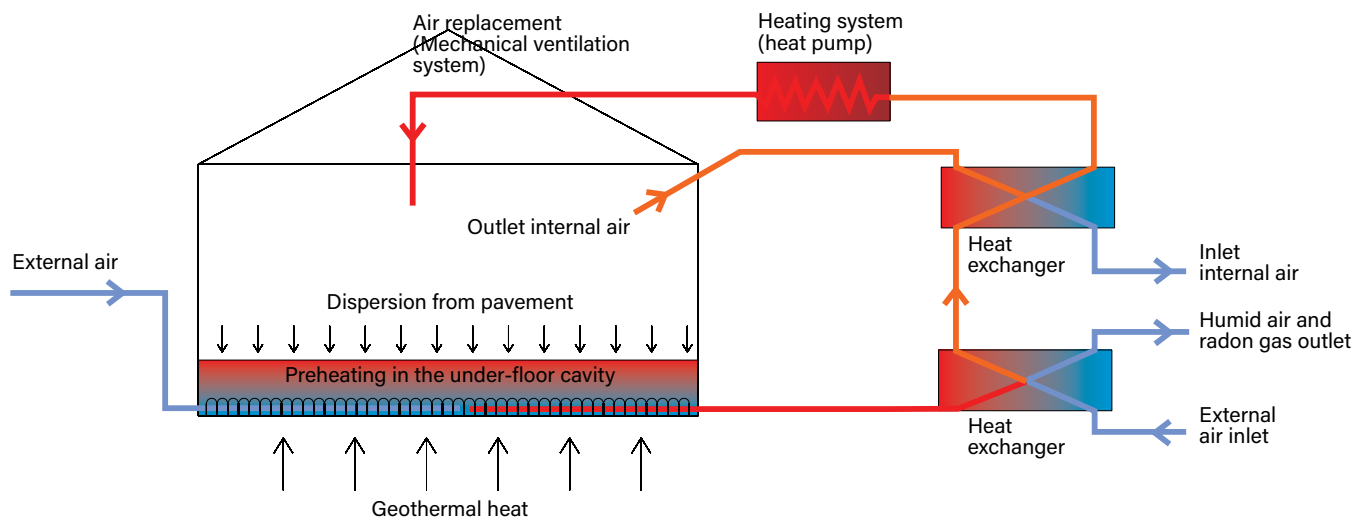
GBC Italia partner

Daliform Group Srl has again demonstrated its particular attention to sustainable building and respect for the environment by becoming an ordinary member of the **Green Building Council Italia**.

Today, on an international level, one of the new challenges for our industry is represented by **LEED certification** (*Leadership in Energy and Environmental Design*), one of the building certification systems that is currently most widespread in the construction industry. The goal of GBC Italia is the transformation of the market so that the "green buildings" - buildings with a **low environmental impact** - become commonplace and are accepted as a deep-rooted factor in society. These are the **values that drive the Daliform Group** to work on developing and offering innovative products for efficient constructions, guaranteeing **wellbeing and a healthy environment**.

Energy recovery with Iglù®

Natural ventilation has advantages with regard to the health of the environment, but directs a quantity of heated air outside of the buildings from the loss of building and ground heat (see diagram below).



Growing sensibility towards the more sustainable use of resources has led the Daliform Group to study the thermodynamic effects of the under-floor cavity, with particular focus on the recovery of the geothermal heat it contains, which is generally wasted.

The system, which involves the use of increasingly common technological systems such as heat exchangers and heat pumps/ compact aggregate pumps, makes it possible to significantly improve the performance of CasaClima certified buildings.

For example, in a CasaClima B certified house, with an energy consumption for heating of less than 50 kWh/m² per year, the latter can be further reduced by at least 2.7% thanks to the use of the energy recovery system; in a CasaClima A certified house (<30 kWh/m² per year) a further saving of 4.4% could be obtained; finally, if the house is certified as CasaClima Oro (<10 kWh/m² per year), this savings would be 11.3%.

In this case, a "package" was created consisting of the following, from the bottom upward:

- Gravel cm 10
- Iglù® cm 27 + Beton Up
- 15 cm slab
- 20 cm insulation (EPS)
- 5 cm screed

The transmittancy of this package was calculated according to the regulations of EN ISO 13370.

The adopted solution foresees the creation not of a traditional under-floor cavity, but a slab that acts statically like a double floor. This is to avoid the lean concrete below the Iglù® formworks, which increases the thermal capacity of the (wet) ground, thereby recovering the heat.

An alternative solution foresees the use of Iso Iglù® directly above the under-floor cavity; in this case the following "package" is created:

- Gravel 10 cm
- Iglù® 27 cm
- Iso Iglù® 10 cm
- 15 cm slab

The advantage in this case is that the concrete can be poured with one casting, creating at the same time the foundation beams and the slab, avoiding the use of lean concrete and screed.

The last example, which is only to be applied in an area without Radon gas, foresees an outdoor pit with a condensation exhaust fan that is able to dehumidify the air in the under-floor cavity without mixing it with outdoor air. In this way, an under-floor cavity is obtained that performs like a closed cavity, better insulating the building from the ground.

Accessories

L-Plast accessory



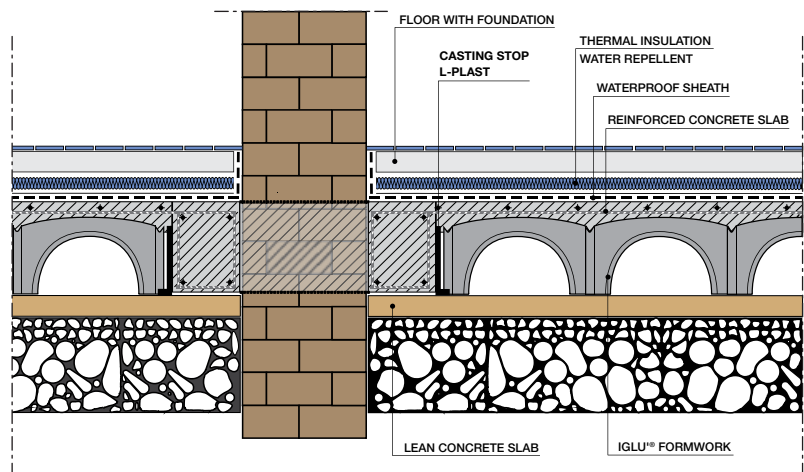
Advantages:

- Ease of positioning due to die cutting.
- Easy to cut to permit the passage of ventilation pipes, sewer and system piping.
- Quick to install, saving up to 80% of the time required for traditional procedures.

L-Plast is used for new constructions to create the slab and foundation beams with a single concrete casting; when restructuring is used to easily create reinforcement curbs for existing foundations.

Furthermore, L-Plast is ideal for creating air ducts in general, such as for cold rooms, for example (if forced ventilation is necessary) or in geothermal applications where air must be blown into the under-floor cavity.

When restructuring, when the existing walls must be reinforced or when an underpinning must be created, L-Plast is a useful work tool that helps creating a new slab or reinforcement base with a single casting.



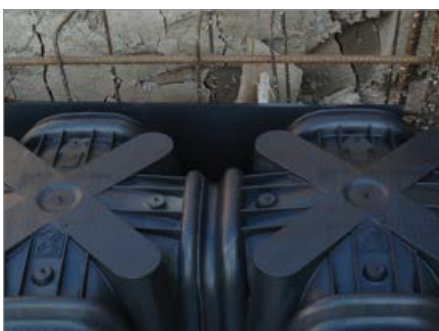
L-Plast is delivered in 2 m panels with a pre-folded line (die cutting).

Simply fold it along the line and position on the ground the short part of the L, keeping the long part vertical, sustained by a part of Iglu® or another foundation cage.

H (cm)	D (cm)	L (cm)	th (cm)	Iglu® of reference
12	8	205	0,25	h 8 - 10 - 12 - 14
14	7	205	0,25	h 16
18	7	205	0,25	h 18 - 20
25	7	205	0,40	h 27
23	5+7	205	0,30	h 22 - 25 - 30
33,5	5+5+6,5	205	0,40	h 35 - 40 - 45
49	7	205	0,50	h 50 - 55*
54	5+7	205	0,50	h 55 - 60**
64	5+10	205	0,60	h 65 - 70
74	5+10	205	0,60	h 75 - 80

* Only for Iglu® H50 and Iglu® Plus H50 - H55.

** Only for Iglu® H55 - H60.



Iso Iglu® - for insulated slabs

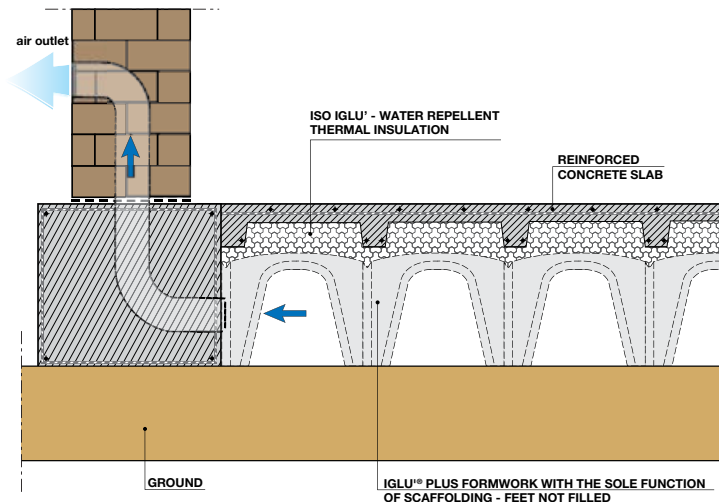


Only for IGLU® PLUS from H 16 to H 45

Iso Iglu® 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.

The 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.

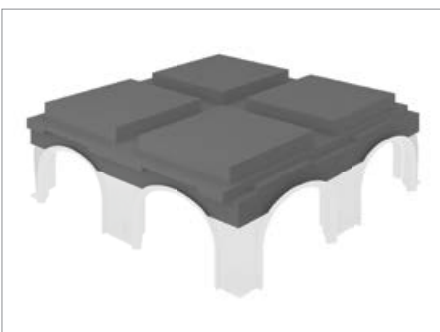
Using an Iso Iglu® panel in EPS, together with a ventilated underfloor cavity made with Iglu® Plus formworks, a ribbed slab foundation is created in reinforced concrete which rests along the edges of the perimeter structure of the building (walls and foundations), insulated on the intrados and free from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



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.

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.



Accessories

Beton Up - for monolithic slabs

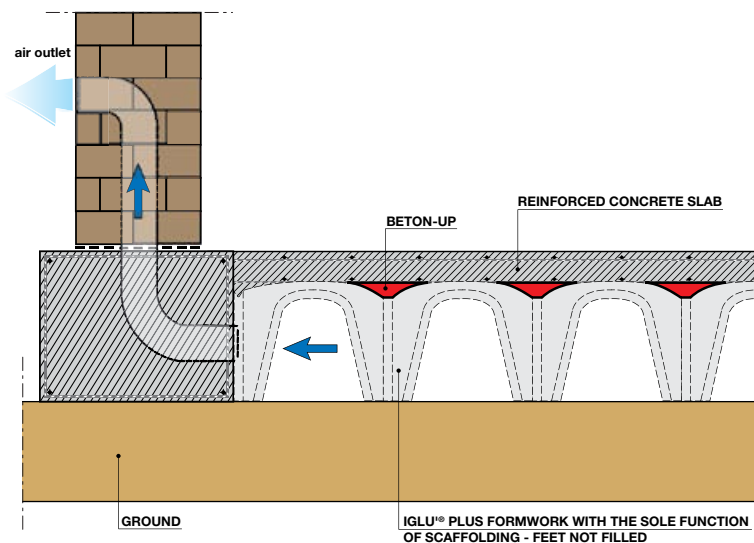


Only for IGLU® PLUS



Beton Up is an accessory for the Iglu® system (or Atlantis) that prevents the concrete from forming feet. In this way, the formworks take on the simple function of scaffolding on which a monolithic reinforced concrete slab can be created that is bound to the surroundings. With Beton Up the slab is not self-supporting.

The use of Beton Up is necessary when a ventilated floor must be created when the ground is excessively deformed or when the clearance must be increased between two supports and form, for example with the combined use of Atlantis, an inspectionable tunnel.



PIBI Stop - for diagonal beams



It is a casting stop panel for obstructing, as needed, the "side tunnels" of the individual Iglu® or Iglu® Plus and is available for all heights. Given its ease of positioning, PIBIstop is optimal for creating foundation beams without the need to use classical wood shuttering. In combination with Iglu® or Iglu® Plus it is ideal for creating diagonal beams. Finally, based on its characteristic of being connected to the individual unit, it is particularly suited for reconstruction where an underpinning must be created where the existing structures are often not squared.



H (cm)	B (cm)	L (cm)	th (cm)	Reference formwork IGLU®
14	2+2+2+5	40	0,40	h 14 - 16 - 18 - 20
22	3+5	45	0,40	h 22 - 25
27	5	45	0,40	h 27
30	5+5+5+5	45	0,40	h 30 - 35 - 40 - 45
50	5+5+7	49	0,40	h 50 - 55 - 60
65	5+5+5+15	62	0,40	h 65 - 70 - 75 - 80

H (cm)	B (cm)	L (cm)	th (cm)	Reference formwork IGLU® PLUS
15	5	45	0,40	h 16
26	5	45	0,40	h 20 - 27
34	5+5+5	45	0,40	h 35 - 40 - 45
49	5	45	0,40	h 50
54	5	45	0,50	h 55

Prolunga



Plastic extension:
only for IGLU® from H 14 cm to H 80 cm



Expanded polystyrene extension

A component in expanded polystyrene of suitable density to resist concrete pressure, which makes it possible to develop a ventilated floor in any shape or size and allows the simultaneous casting of foundation beams and slab, with great savings in time for the labor.

The advantages are:

registration of extension stretching up to 50 cm in length; casting in a single phase of the substructure grating and the ventilated floor, saving on reinforcement and dismantling operations; perfect development of the ventilated floor even for plans with a complex shape and size; reduction of need for shuttering shaping. The extensions are sold by multiples of 10 cm.

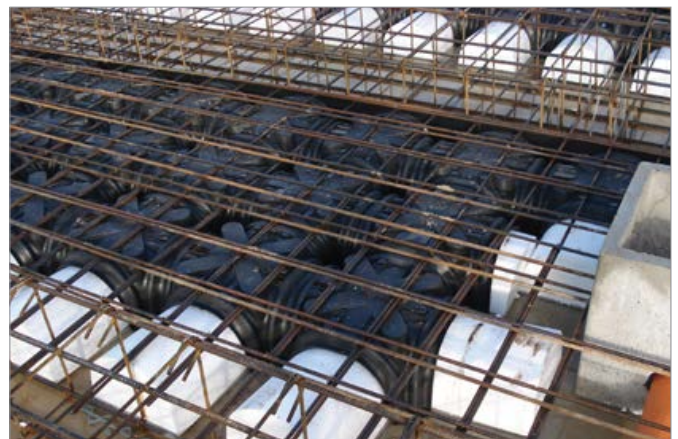
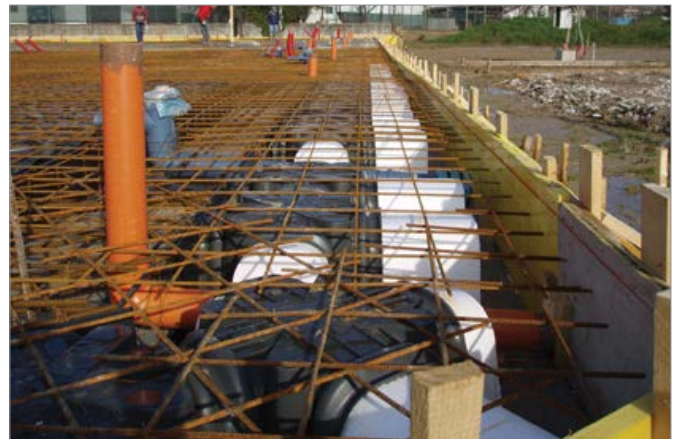
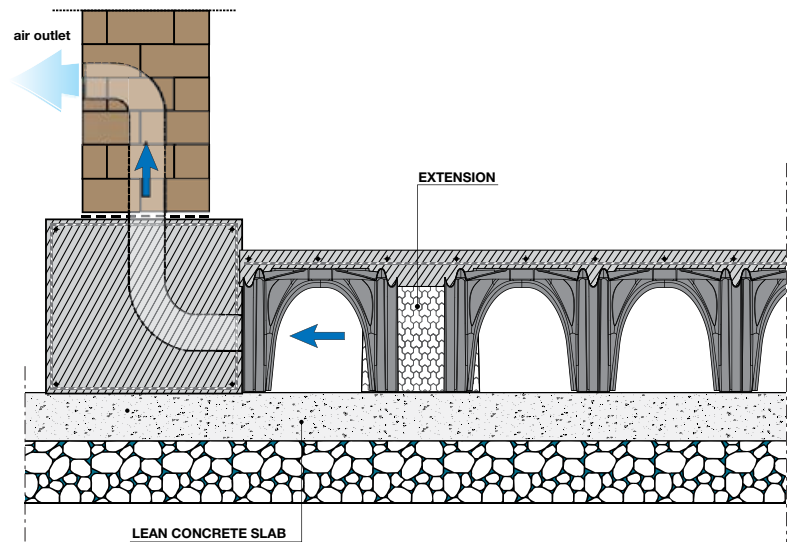
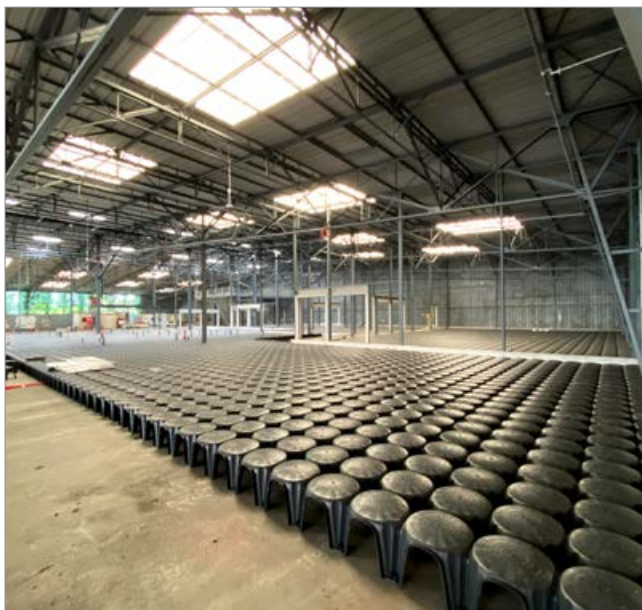


Photo gallery



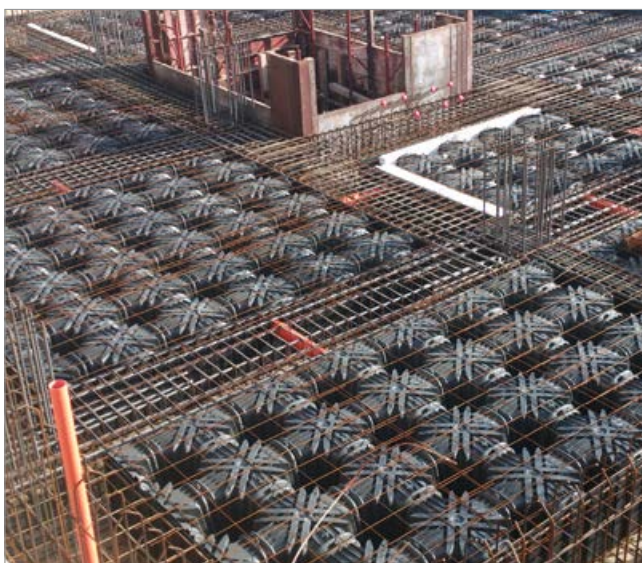
Ventilated cavity for a residential building



Ventilated cavity for a shopping center



Rainwater dispersion tank under a parking area



Ventilated cavity for a residential building



Ventilated cavity for a residential building



ITC Lab - Office building



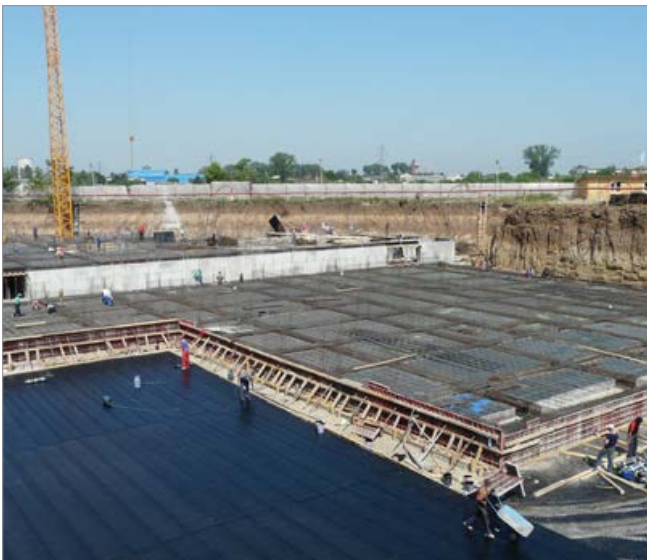
Photo gallery



Tour Trinity - level off different heights in the intermediate floors



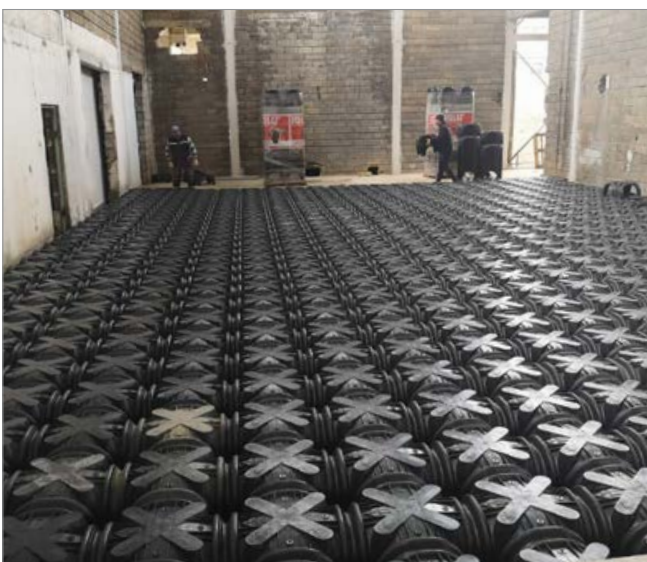
Ventilated cavity for a residential building



Ventilated cavity for an industrial building



Ventilated roof



Ventilated cavity for a cold room



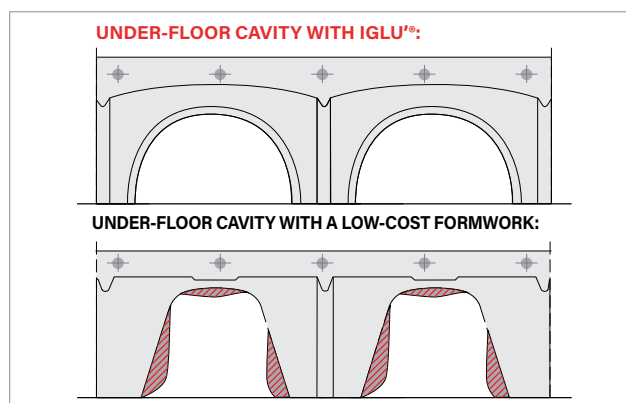
Realization of a square for a residential complex

Iglu'® PLUS: the excellence

The quality of the "compound", the particular shape, the thicknesses, the dimension of the product and the work techniques make Iglu'® a product of excellence. All these features become more interesting for Iglu'® Plus.

Numerous national and international recognitions have been obtained over the years that attest to the vast and well-appreciated contribution that Iglu'® has provided to the construction industry: Award for Technological Building Innovation "Construmat 95" Barcelona, Carnia Alpe Adria Award "100 greenest projects in Italy, Environment Business Award 2006. Numerous Product and System Certifications have been received that prove not only product quality, but also the validity of the constructive solutions and the applications in the building industry. All of this, together with the advantages mentioned below, confirm that Iglu'® is the product of reference for operators and professionals.

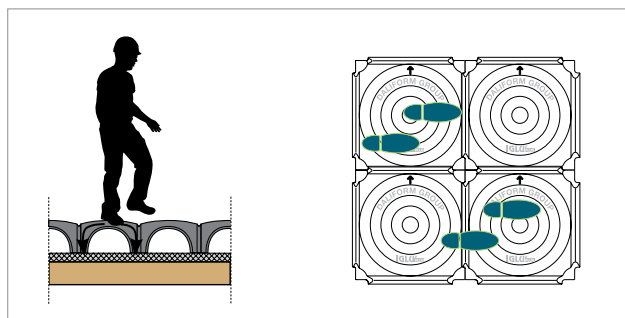
Non-deformability of the preforms and real concrete consumption



Iglu'® is produced according to high quality standards. The thickness and quality of the raw material (even if recycled) make it absolutely rigid and non-deformable under the weight of the operators and the concrete in its "fluid" phase, which guarantees: compliance with under-floor cavity geometry and the real consumption of concrete.

Low-cost formworks, to be such, are produced using less material, resulting in a reduction in the thicknesses and the structure, due to which the product can be significantly deformed under the pressure of the casting, resulting in an increased use of concrete, thereby increasing costs. This creates a FALSE savings in an underhand manner as the person using it is convinced of the savings, but ends up spending more.

Guaranteed results and operator safety



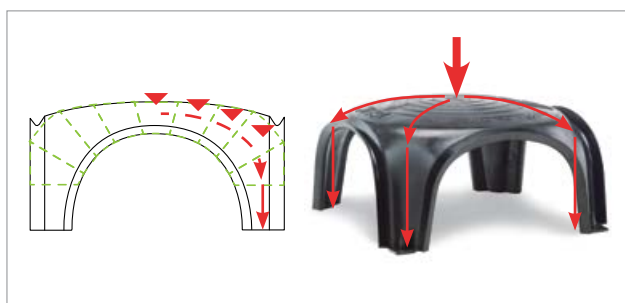
Iglu'® Plus allows the walkability in all the areas of the calotte, also without the pre pose of the reinforcing net. Instead for Iglu'® read the specification.

Most work accidents, whose scope is becoming increasingly alarming, occur on building sites.

With Iglu'® operators work safely with full compliance of Leg. Decree 81/08. In fact, to guarantee pedestrian access during positioning and casting, which is a necessary condition to guarantee operator safety, the Iglu'® frameworks guarantee a minimum breaking resistance of 200 kg concentrated on a surface of 8 x 8 cm; they are constantly subjected to a rigorous quality control system.

Iglu'® has numerous studies and tests that measured the circulation of air in the cavity; calculation tables approved by engineers from certifying bodies; calculation procedures for the interaction with the ground to be applied in the case of heavy loads.

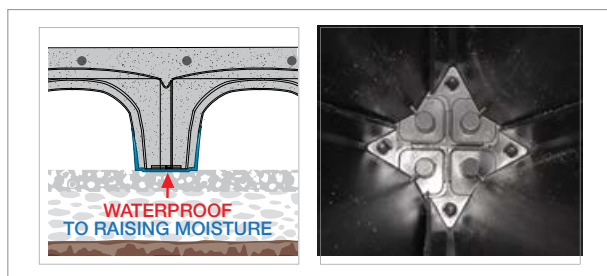
Iglu'®: arch effect and modularity



The arch is the most classic "pressing structure". Early Romans adopted this static solution to create large openings without compromising structure resistance. Iglu'®, due to its exclusive shape, provides the concrete casting with maximum structural performance, thanks to the arch effect; therefore with an equal slab thickness or, if we want, with an equal static performance a thinner slab and therefore reduced use of concrete.

The 50x50 cm modularity of Iglu'® makes it possible to immediately simulate the calculation thanks to its perfect geometries and exactly identify the minimum points of thickness.

Complete seal at the pillar base



Attention to quality and individual aspects provides Iglù® with important constructive details, such as the perfect seal at the base of the pillar that prevents humidity from rising due to capillarity.

It is fundamental to prevent numerous points of contact (equal to the number of pillars on which the slab rests) between the structure and the underlying ground to obtain an optimal result to find a definitive solution against rising humidity. Sometimes attention is not paid to certain details, believing incorrectly that all products are the same as Iglù®, which makes the result worthless.

Environmental compatibility



Daliform Group has again demonstrated to be extremely precise with regard to respecting health and the environment having been the first to obtain **Environmental Compatibility Certification (CCA)** for its products.

This certificate is very important for Iglù® because it demonstrates: the lack of dangerous substances in its composition (even if recycled materials are used); the lack of emissivity of toxic substances during the various phases of the product's life and operating cycle, which benefits the health of the intermediate users (production and installation personnel) as well as final users (people living in the building) as well as the environment in general.

Certifications



Daliform Group products comply with the strictest international standards and have received product certifications such as :

BBA (UK), Technical Construction Certificate issued by the Technical and Test Institute for Constructions Prague (Czech Republic), Technical Construction Certificate issued by the Agency for Quality Control and Innovation in Building (Hungary), Hygienic Certificate issued by the National Institute of Hygiene (Poland), Acoustic check for the verification of DIN standards, Avis Technique issued by the French institute CSTB.

A series of rupture load tests have been carried out and certified by the University of Padua as well as "Productive process monitoring tests".

Green Public Procurement



Iglù®, is included in the list of products provided for by M.D. no. 203/2003 that directs the Public Administration towards purchasing recycled products for at least 30% of its requirements. Iglù®, as is the case with all Daliform Group products, effectively and concretely pursues the development of sustainable development and is one of those products for which builders are "rewarded" pursuant to GPP, "Green Purchases by the Public Administration", a tool through which the PA combines, and even subordinates, "green criteria" with economic principles to select products that have a minor/reduced impact on human health and on the environment in comparison to other products with the same purpose (Leg. Decree 163/2006).

Daliform Group technical office



FEASIBILITY STUDY

Predimensioning and optimisation of the structures, alternative 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.

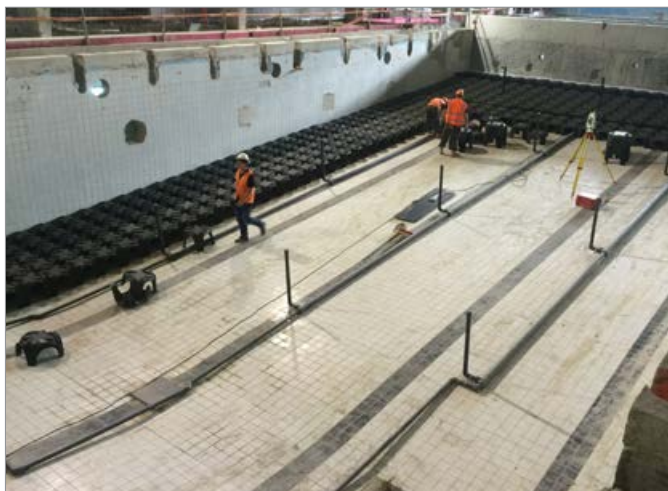
ON-SITE SUPPORT

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



Pool restructuring



Logistics platform



House renovation



Ventilated interspace for industrial building

Specifications

IGLU® SPECIFICATION

Implementation of a ventilated under-ground cavity for a total height of _____ cm with the supply and on-site positioning of recycled plastic Iglu® formworks from the Daliform Group for the quick dry formation of a self-bearing pedestrian accessible platform above which the C25/30 concrete is cast to fill the formwork up to its crown and an upper slab of _____ cm reinforced with welded mesh Ø _____ cm 20 x 20 cm, levelled and smoothed with a plastering trowel.

Iglu® formworks must have dimensions of 50 x 50 cm between centres (or 57.8 x 57.8 or 71 x 71 cm) and _____ cm in height, rest solely on the four lateral feet to guarantee maximum ventilation and facilitate the passage of utilities, have a dry breaking resistance of 150 kg on the arch between contiguous legs by means of an 8 x 8 cm pressure plate, system for joining and maintaining dryness by overlapping the double arch portion, flat and embossed cross on the top of the dome for the correct positioning of the mesh in the reinforced concrete casting.

Formworks in recycle plastic, such as Iglu®, must be produced in "ALAPLEN" CP30", must not release polluting substances, have an Environmental Compatibility Certification and be produced by a Company Certified according to International Standards UNI EN ISO 9001 (Quality), UNI EN ISO 14001 (Environment); BSI OHSAS 18001 (Safety) and SA 8000 (Social responsibility).

The company that supplies the Iglu® formworks must exhibit technical sheet and safety sheet for the product and for "ALAPLEN" CP30" grain texture and must also exhibit the product certificate approved by an EOTA member agency (European Organisation for Technical Approvals).

Including accessories, waste, cutting and all other expenses: _____ /m² _____

IGLU® PLUS SPECIFICATION

Implementation of a ventilated under-ground cavity for a total height of _____ cm with the supply and on-site positioning of recycled plastic Iglu® Plus formworks from the Daliform Group for the quick dry formation of a self-bearing pedestrian accessible platform above which the C25/30 concrete is cast to fill the formwork up to its crown and an upper slab of _____ cm reinforced with welded mesh Ø _____ cm 20 x 20 cm, levelled and smoothed with a plastering trowel.

The Iglu® Plus formworks must have dimension of 50 x 50 cm between centres and _____ cm in height, rest solely on the four lateral feet to guarantee the maximum ventilation and facilitate the passage of utilities, and have a dry breaking resistance of 200 kg in any portion of the cap by means of an 8 x 8 cm pressure plate

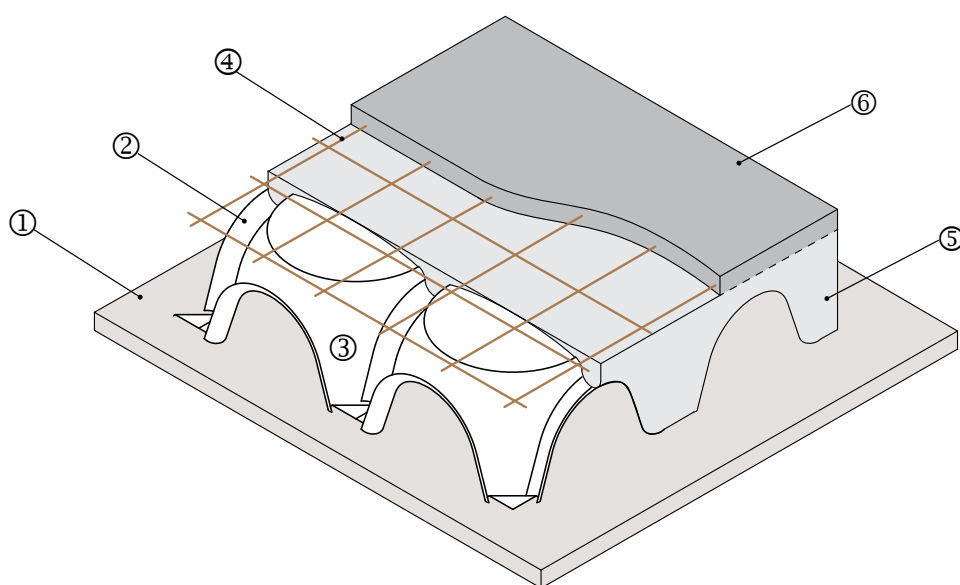
Formworks in recycle plastic, such as Iglu® Plus, must be produced in "ALAPLEN" CP30", must not release polluting substances, have an Environmental Compatibility Certification and be produced by a Company Certified according to International Standards UNI EN ISO 9001 (Quality), UNI EN ISO 14001 (Environment); BSI OHSAS 18001 (Safety) and SA 8000 (Social responsibility).

The company that supplies the Iglu® formworks must exhibit technical sheet and safety sheet for the product and for "ALAPLEN" CP30" grain texture and must also exhibit the product certificate approved by an EOTA member agency (European Organisation for Technical Approvals).




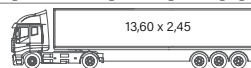


Including accessories, waste, cutting and all other expenses: _____ /m² _____

Supply and installation cost grid

No.	Item	U.M.	Quantity	Unit price	Total
1	Supply and casting of lean concrete with a thickness of ____	m ³ /m ²			
2	Supply of the IGLU'® formwork, h ____	m ² /m ²	1		
3	Dry installation of the IGLU'® formwork on the prepared surface	h/m ²	0,0125		
4	Supply and positioning of the welded mesh Ø ____ mm - 20x20 cm	kg/m ²			
5	Supply and casting of concrete C25/30 - for filling up to the crown	m ³ /m ²			
6	Supply and concrete casting CLS C25/30 - for a slab of cm ____	m ³ /m ²			
				Total cost €/m ²	



Logistics - pallet capacity

MEANS OF TRANSPORT	NO. OF PALLETS	
Tractor (8.20/9.60x2.45)	14/16	
Trailer (6.20x2.45)	10	
Tractor+ Trailer type "BIG" (8.40+7.20x2.45)	14+12	
Semi-trailer (13.60x2.45)	24	
20 feet container	10*	
40 feet container	20*	

* the m² per pallet can vary based on the type of container.

The information contained in this catalogue could be changed. Please request updated informations from DALIFORM GROUP, which reserves the right to make changes at any moment without notice. In consideration of recycled material, it is specified that there are tolerance margins caused by environmental factors.



www.daliform.com

DG_UG - Rev. 19-07/24

Made in Italy

dali*form*
GROUP
Building Innovation © Creatori dell'Iglù®



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

Partner of
GBC Italy

Rating di legalità: ★★+



PRODOTTO CONFORME
ai criteri di
COMPATIBILITÀ AMBIENTALE
Attestato rilasciato dal Dipartimento ABC -
Politecnico di Milano

plastica
seconda vita
MIX ECO