REUSABLE FORMWORK IN ABS FOR WAFFLE SLABS

skydome

system for two-way ribbed slabs

- INNOVATIVE
- LIGHT
- REUSABLE

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SKYDOME VISION

By wisdom the house shall be built, and by prudence it shall be strengthened.

(Proverbs, Old Testament)

A HEALTHY HOUSE IS IMPORTANT BUT IT IS NOT ENOUGH. IT MUST ALSO BE SAFE. GEOPLAST CARES ABOUT IT.

A safe, healthy and comfortable house, which can resist over time is not a dream... today it is possible!

Just choose the best ally: ABS. It is an extraordinary material, which lighten the structure while making it robust: these characteristics can make the difference in case of a earthquake.

Unlike other traditional construction materials, ABS does not absorb water and therefore it does not release moisture over time: with it your house will stay dry and comfortable.

Moreover, it is a plastic recycled material which respects the environment.

Geoplast S.p.A. in Green Building Council Italia, The Network of Green Building.

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SKYDOME

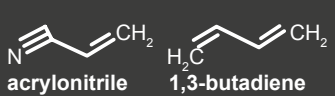
FORMWORK IN TECHNOPOLYMER

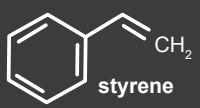
SKYDOME is a system of modular formwork in plastic used to build two-way ribbed slabs in residential and commercial buildings.

The system was designed to decrease the weight of traditional full-concrete slabs. The dome-shaped forms create a matrix of voids surrounded by orthogonal ribbing, producing a two-way configuration very suitable for large-spanning slabs.

Why ABS

(Acrylonitrile Butadiene Styrene)





- High mechanical strength
- Shock resistance
- Thermal stability (-30°C / + 70°C)
- Very high surface quality
- Recyclable material

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SKYDOME ADVANTAGES

Recoverable formwork system for the realization of bi-directional waffle slabs with large spans

seismic resistance

SKYDOME hollowed slab reduces the mass of the structure producing considerable advantages in seismic performance

lightness

The composing elements are very light and can be easily installed and handled

reuse

ABS plastics does not stick to concrete, thus dismantling is extremely easy making the formwork very quickly available for the next cycle

large spans

SKYDOME system makes it possible to design slabs spanning up to 13 m without drop beams or other protruding elements

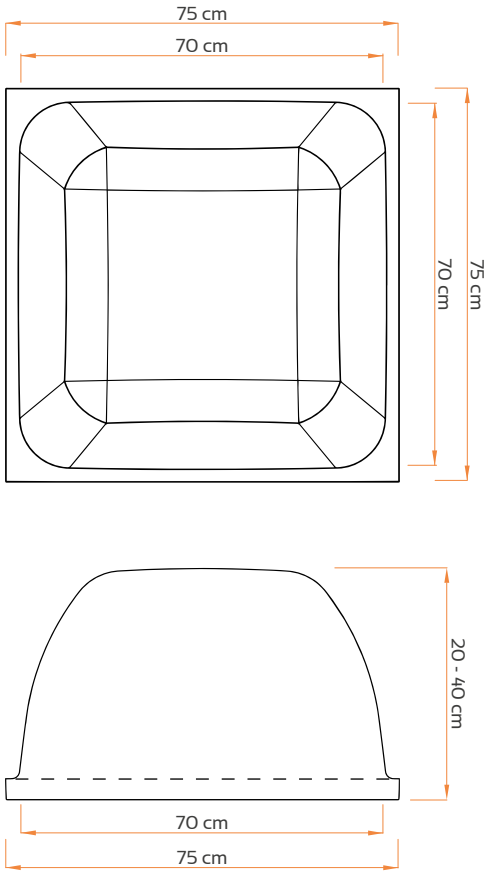
architecture

The waffle slab is pleasing to the eye and can be left exposed, creating aesthetically enjoyable environments

acoustics

The shape of the domes reduces sound waves, improving the acoustics of the structure

SKYDOME
THE DOME



REUSABLE

SIZE	
Base	750 x 750 mm
Heights	200 - 250 - 300 - 350 - 400 mm

SKYDOME MATERIAL	
Acrylonitrite Butadiene Styrene	ABS
Coefficient of thermal expansion	0.05 mm/m/°C

BEAM AND CUBE

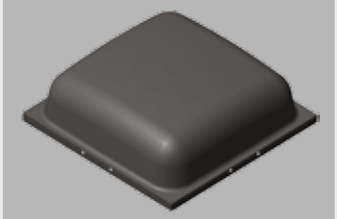
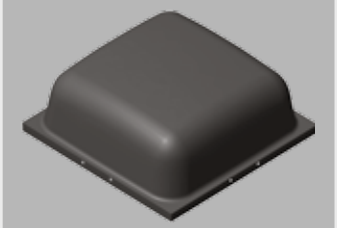
THESE TWO ITEMS COMPOSE
THE SUPPORTING STRUCTURE OF THE DOME

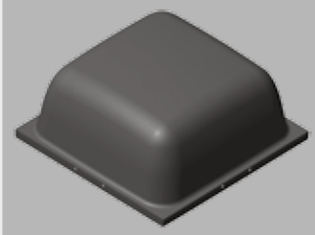
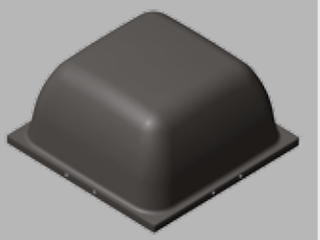
Light and easy to handle
Fits onto standard H20 timber beams
Resistant and reusable

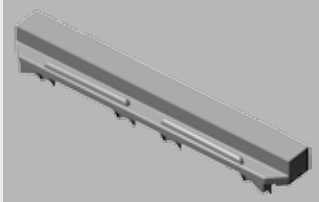
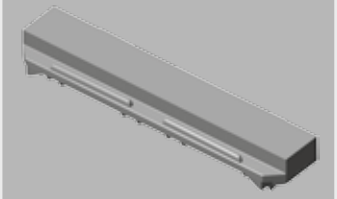
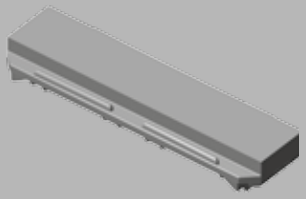
MADE OF ABS, EASILY CLEANSED WITH WATER, READY FOR REUSE

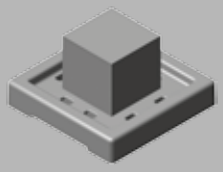
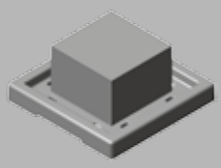
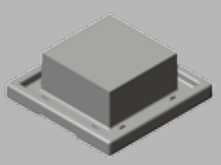
Items and accessories

DIMENSIONAL TABLES

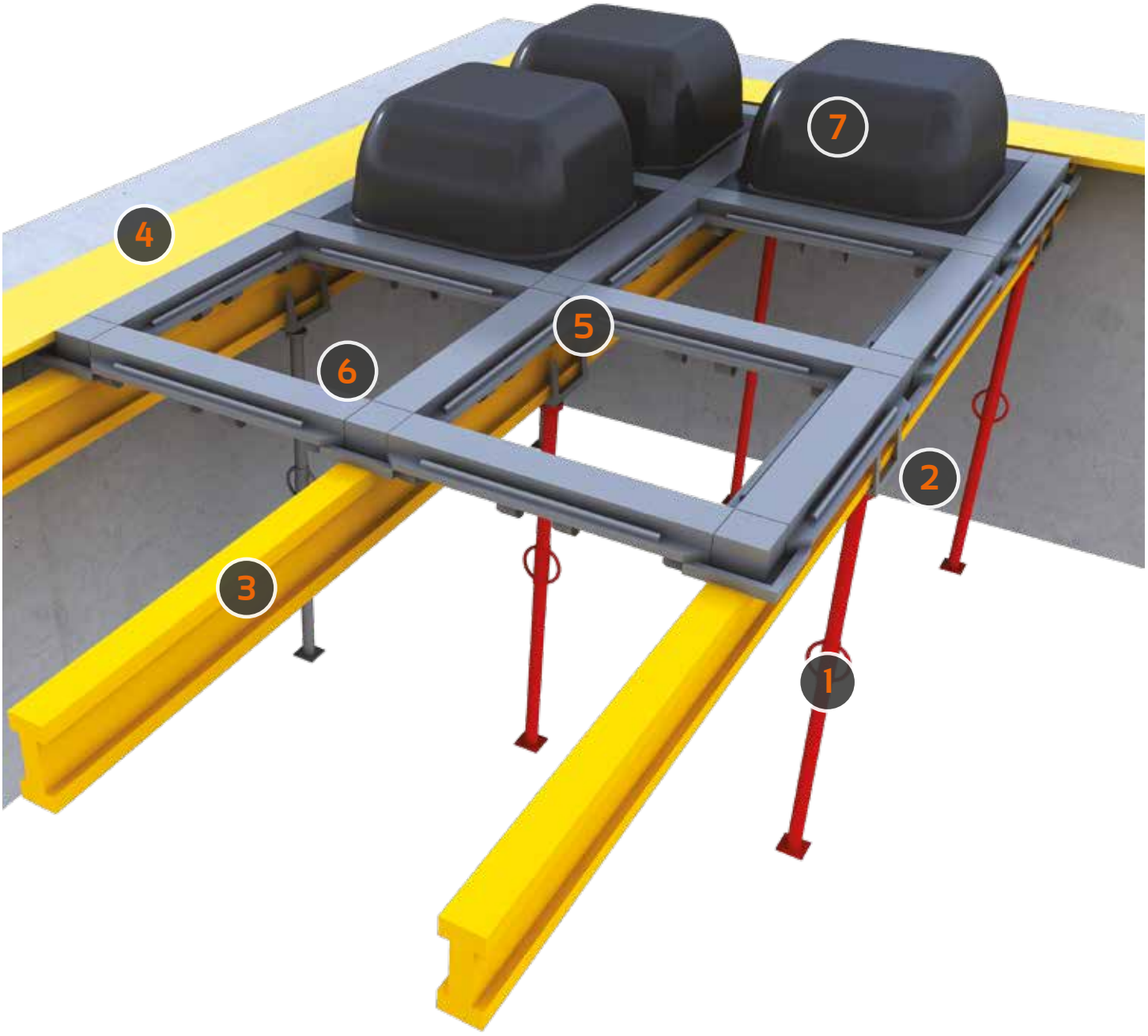
	SKYDOME H200	SKYDOME H250
		
actual size (mm)	75 x 75 x H20	75 x 75 x H25
material	ABS	ABS
weight (kg)	4.83	5.15
package dim. (mm)	75 x 150 x H231	75 x 150 x H236
Nr. pieces per pallet	100	100

	SKYDOME H300	SKYDOME H350	SKYDOME H400
			
actual size (mm)	75 x 75 x H30	75 x 75 x H35	75 x 75 x H40
material	ABS	ABS	ABS
weight (kg)	5.61	5.93	6.25
package dim. (mm)	75 x 150 x H240	75 x 150 x H250	75 x 150 x H255
Nr. pieces per pallet	100	100	100

	BEAM T120	BEAM T160	BEAM T200
			
actual size (mm)	14 x 15 x H10	18 x 75 x H10	22 x 75 x H10
material	ABS	ABS	ABS
weight (kg)	1.60	2.21	2.74
package dim. (mm)	75 x 120 x H216	75 x 120 x H218	75 x 120 x H219
Nr. pieces per pallet	200	120	100

	CUBE C120	CUBE C160	CUBE C200
			
actual size (mm)	15 x 15 x H10	19 x 19 x H10	23 x 23 x H10
material	ABS	ABS	ABS
weight (kg)	1.61	1.92	1.92
package dim. (mm)	75 x 120 x H210	100 x 120 x H210	100 x 120 x H220
Nr. pieces per pallet	500	500	300

ITEMS AND ACCESSORIES



1. STEEL PROP
2. PROP FORK
3. TIMBER BEAMS
4. TIMBER INFILL
5. SKYDOME CUBE
6. SKYDOME BEAM
7. SKYDOME DOME

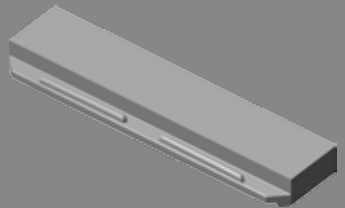
FLAT SYSTEM

In combination **with supporting decks**

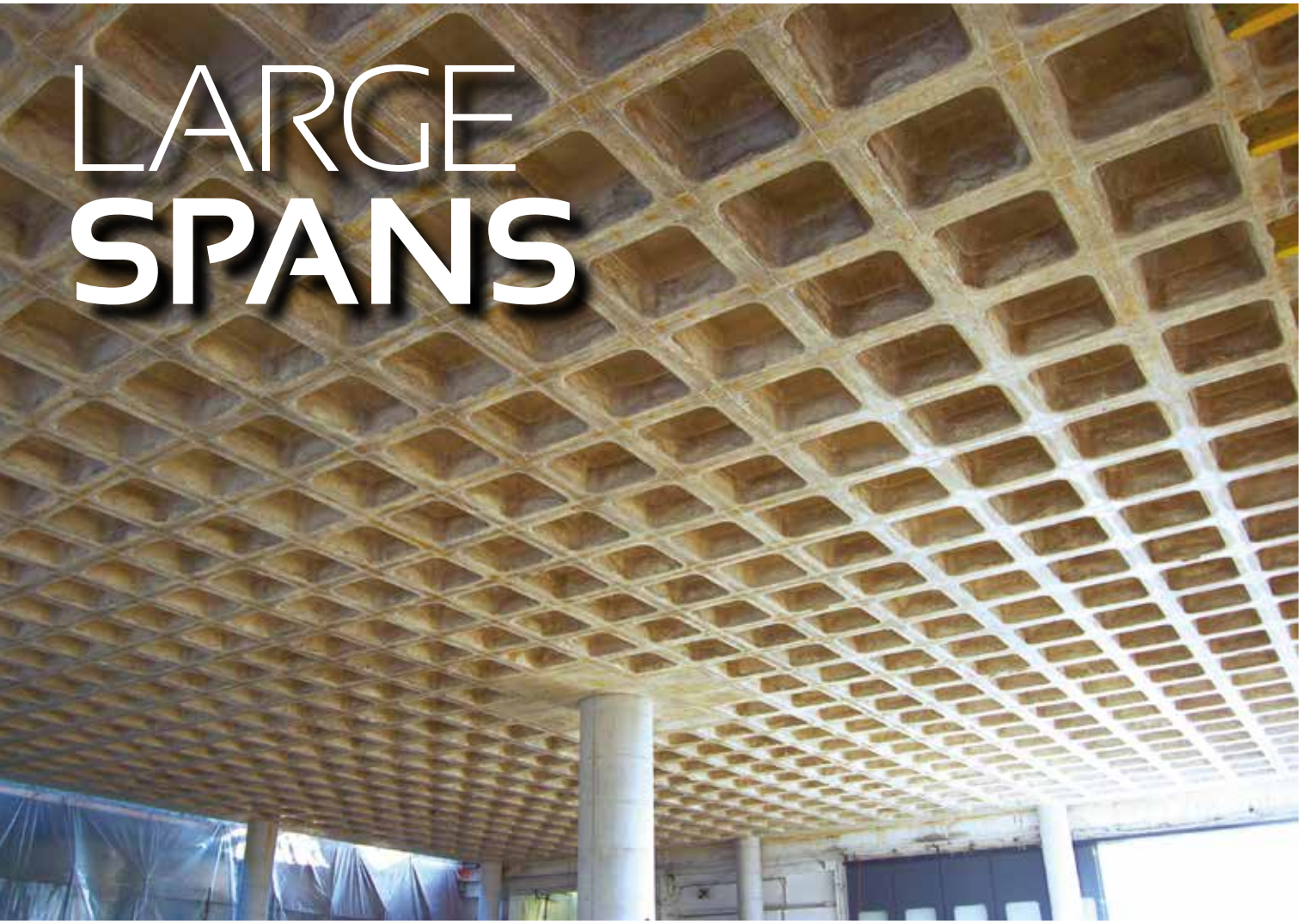
SKYDOME FLAT can be installed on a flat slab formwork, which becomes a supporting deck for the SKYDOME system items. SKYDOME FLAT beams and cubes were specifically engineered for this application, housing the standard SKYDOME domes. The final result - a two-way waffle slab - is identical to the one obtained by standard SKYDOME elements. All system items are easy to dismantle and are cleansed just with water before being ready for reuse. The excellent smooth finish can be left in sight without need for a suspended ceiling.

Walkable formwork surface
Does not suffer weathering
Light and easy to handle

BEAM TF120 TF160 TF200



CUBE CF120 CF160 CF200



LARGE SPANS

Reusable formwork for slabs

SKYDOME system allow the realization of two-way hollowed slabs which reduce the use of concrete, thus decreasing the self weight of the structure. SKYDOME reusable elements are used to form decks on which the concrete can be poured. Once the concrete has cured, SKYDOME will be removed, thus obtaining a smooth and pleasing ceiling often left exposed by design. This formwork system is used to realize large-spanning reinforced concrete slabs..

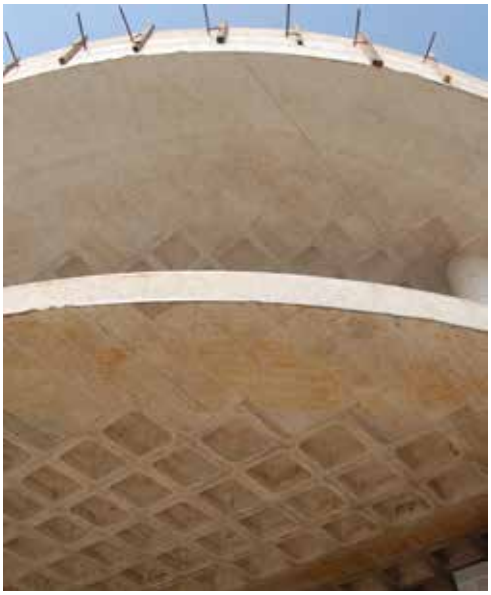
Safe work
Smooth results
Reusable formwork

MULTI-LAYER BUILDINGS

Seismic advantages

The self-weight of concrete slab formed with SKYDOME is up to 30% lower than a full concrete slab. This is a distinct advantage as it reduces the the oscillation of a building during an earthquake thus increasing its structural resistance. Moreover the weight reduction of the slab allows design and cost advantages for the overall concrete frame.

Reduced seismic mass
Lighter concrete frame
Light and easy to handle



MULTI-STOREY CAR PARKS

Simplified passage of **underground utilities**

A waffle slab formed with SKYDOME virtually eliminates the need for drop beams and column heads. This makes the soffit completely flat removing all obstacles to the passage of tubes, plumbing and all systems, making their installation easier and more economical.

Beams of same depth as slab
Soffit without dropped elements
More flexibility in rc frame design

ACOUSTIC PERFORMANCE

Sound abatement

The characteristic dome shape of SKYDOME waffle slab provides a considerable advantage in terms of noise reduction. The shape of the cavities in the slab refracts sound waves thus producing noise absorbtion and an improvement of the acoustics within a building. This is particularly important in environments such as schools or classrooms where the noise otherwise tends to reverberate reducing speech intelligibility, rendering the room less productive for learning.

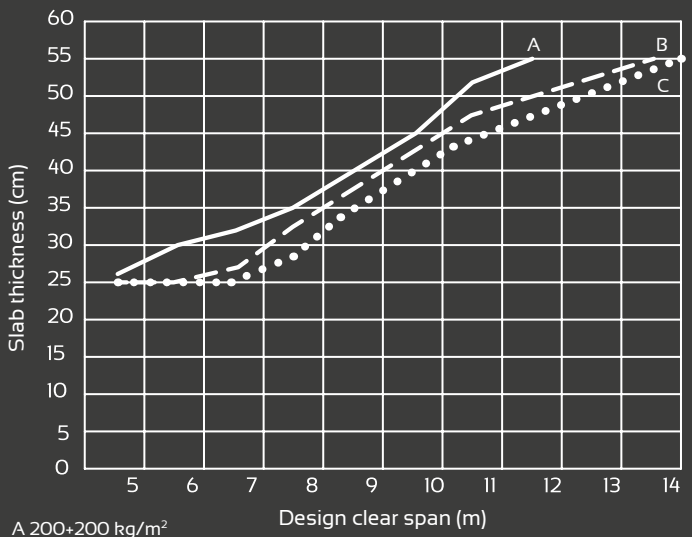
Ideal for class rooms
Noise reduction
Better acoustics

- CLASS ROOMS
- LECTURE HALLS
- MEETING HALLS
- SCHOOL CANTEENS
- STUDY HALLS
- PUBLIC BUILDINGS

PRELIMINARY DESIGN

Slab depth **calculation**

Based on the design span and the imposed load it is possible to make a preliminary assessment of the required thickness of a SKYDOME slab, as shown in the chart to the right.



A 200+200 kg/m²
B 400+300 kg/m²
C 600+300 kg/m²

Example

For a load of 600+300 kg/m² (live + dead loads) and clear spans (distance between columns) of 8m, the slab thickness is approximately 350 mm (dome + topping slab).

In the case of particular loads or specific design constraints the Technical Department of GEOPLAST is available for custom modeling and calculation.

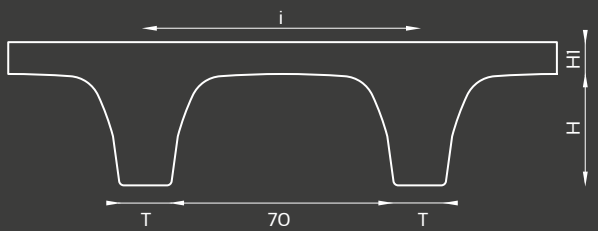
Concrete **consumption**

ITEM	Ribbing width (T) cm	On centres (I) cm	Concrete consumption ribbing m³/m²	Concrete consumption of the slab m³/m²		
				Topping slab depth H1=50 mm	Topping slab depth H1=100 mm	Topping slab depth H1=150 mm
SKYDOME H200	12	82	0.080	0.130	0.180	0.230
	16	86	0.091	0.141	0.191	0.241
	20	90	0.100	0.150	0.200	0.250
SKYDOME H250	12	82	0.099	0.149	0.199	0.249
	16	86	0.113	0.163	0.213	0.263
	20	90	0.125	0.175	0.225	0.275
SKYDOME H300	12	82	0.123	0.173	0.223	0.273
	16	86	0.139	0.189	0.239	0.289
	20	90	0.153	0.203	0.253	0.303
SKYDOME H350	12	82	0.151	0.201	0.231	0.301
	16	86	0.169	0.219	0.269	0.319
	20	90	0.185	0.235	0.285	0.335
SKYDOME H400	12	82	0.185	0.235	0.285	0.335
	16	86	0.205	0.255	0.305	0.355
	20	90	0.222	0.272	0.322	0.372

The table to the left allows to calculate the concrete consumption and consequently the self-weight of the floor according to the height of the dome and the width of the ribbing.

Example

For a slab of 300 + 50 mm (300 mm dome + 50 mm topping slab) with ribbing width of 160 mm, the concrete consumption is 0.189 m³/m² and the self-weight is 472.50 kg/m².



SKYDOME INSTALLATION

1 After the creation of the supporting system (steel props + timber beams) the beams and cubes in ABS are installed in order to build a regular grid where the domes are to be placed. As the grid is created, the domes will be installed, too.

2 Working from below, i.e. in maximum safety, the SKYDOME domes are installed in the previously created. serendole all'interno del reticolo precedentemente creato. Once the first elements are in place the system is walkable.

SKYDOME DISMANTLING

1 After 6-7 gg from the pour, it is possible to dismantle the SKYDOME system removing in sequence steel props, timber beams, cubes in ABS and beams in ABS. The dismantling is done working from below, in complete safety.

2 After having removed the first two rows of beams and cubes in ABS, remove also the SKYDOME domes. After the dismantling, it is necessary to post-prop the slab until full curing of the concrete.

Geoplast Technical Assistance

The **Geoplast Technical Department** ensures the necessary support at every stage of the construction. After analyzing the specifications and design constraints of the project, our technical staff will design the most suitable formwork layout, also including any accessory items. If necessary, on-site assistance can be agreed upon to follow installation, pour and dismantling operations.

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