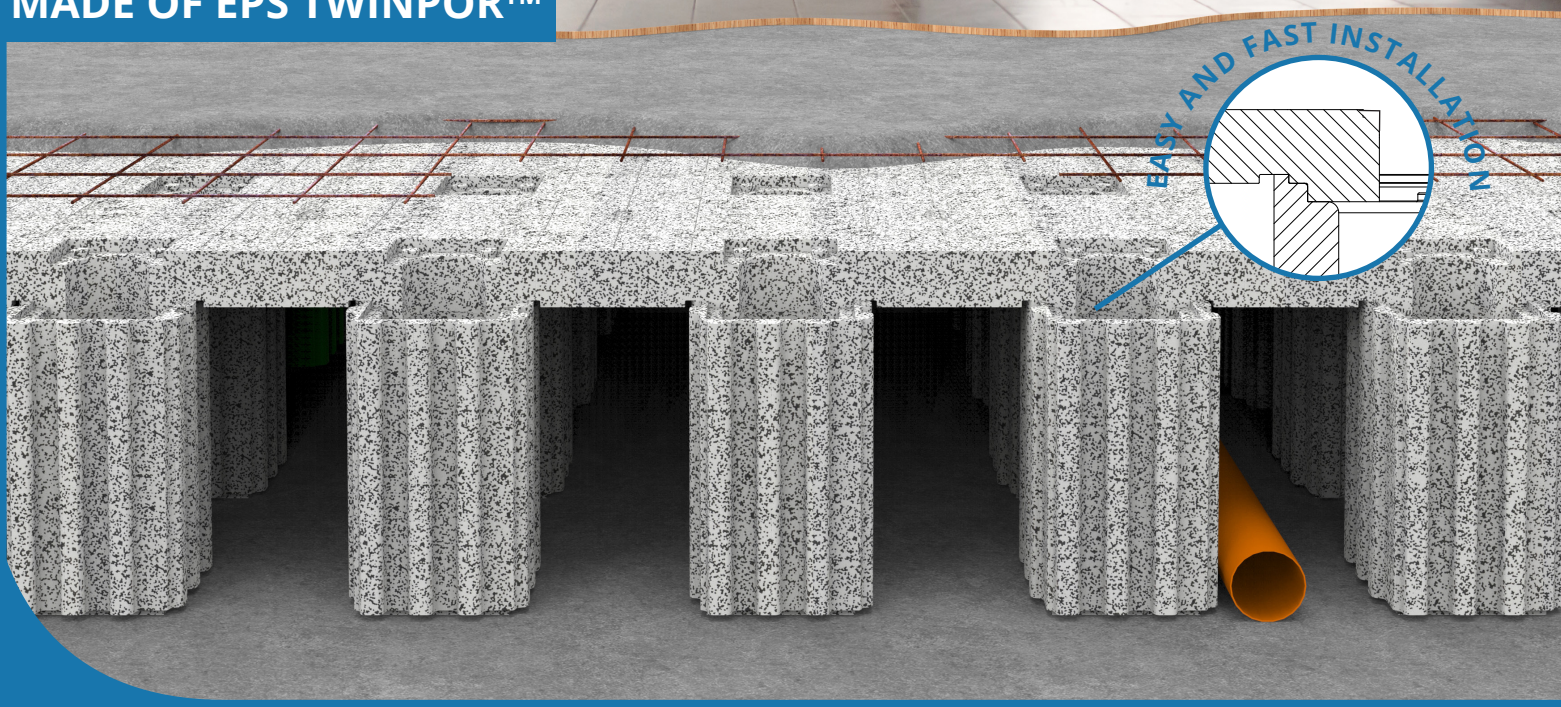
ISOLCUPOLEX®

PATENTED

INSULATING AERATED FLOOR SYSTEM FOR THE GREATEST COMFORT

MADE OF EPS TWINPOR™



- UNDERFLOOR CAVITY FROM 12,5 TO 250 CM
- REDUCED CONCRETE USAGE OF 15%
- 10 % IMPROVED THERMAL INSULATION
- POSSIBILITIES TO BE USED FOR PLANTS OR FLOOR HEATING THANKS TO THE TOP FLAT ELEMENT

PONTAROLO® ENGINEERING

IsolCupolex® is the most effective and sustainable technology for the construction of raised, aerated and insulated floors with variable height up to 2 meters.
The system act as a formwork for the reinforced concrete cast, giving the slab a geometry that provides high load bearing capacity to the floor while creating a hollow space underneath it .
Each element is entirely made of EPS Twinpor™, a high performance innovative material which provides high thermal insulation and the best standards and comfort of living.
The insulation sits towards the outside (cold) part of the building, and by its thermal insulating properties allows the concrete slab to perform as a heat accumulator, contributing to maintain a constant temperature inside the building.
Thereby we obtain a floor with no thermal bridges and a constant radiant temperature, which are essential requirements for a high comfort.

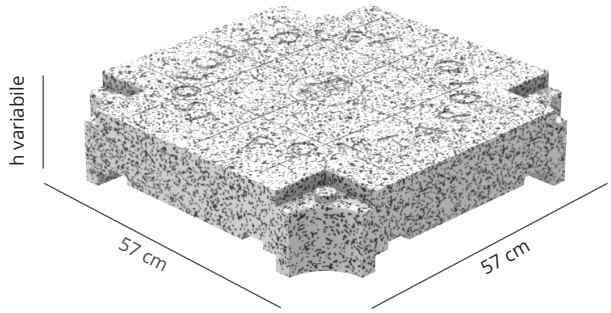
FEAUTURES AND BENEFITS

- Fast and easy to install, with different possible configurations;
- Structure and thermal insulation in the same system;
- Self-extinguishing material;
- High thermal insulation;
- Low environmental impact (2 % material and 98 % air);
- No thermal bridges;
- Longlasting and durable material;
- Reduced thickness of the raised floor;
- 100 % recyclable at end-of-life.

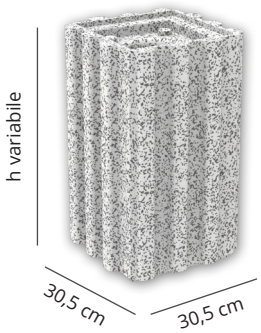
APPLICATIONS

- Raised and insulated floors;
- High thermal performance buildings (NZEB, passive houses, fridge buildings, ...);
- Monolithic cast of foundations and slab;
- Pre-existing floors elevation and renovation;
- Filling material replacement;
- Building in poor soil conditions where ventilation is required, such as in presence of Radon gas.

ISOLCUPOLEX® SYSTEM AND ELEMENTS

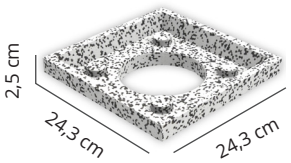


ISOLDOME

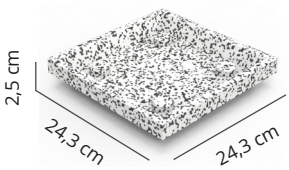


LEG

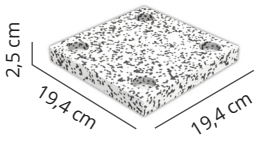
TUBE



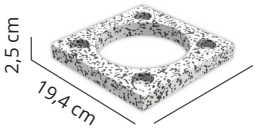
CUP



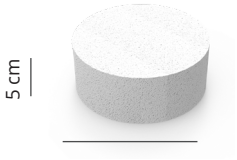
CLOSE CUP



TOP CAP



TOP CROWN

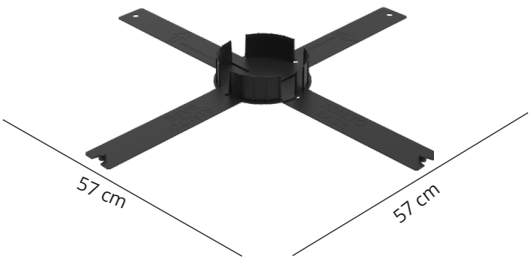


d = 12,7 cm

CLOSURE
High strength

d = 13,6 cm

CLOSURE



BASE

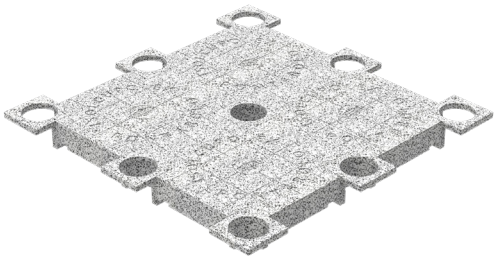
ISOLCUPOLEX Leg can also be used as lateral closing element, allowing the system to fit any project measure, without the need to use the closing sheet element like Spondina.

The Tube is used for heights from 80 to 200 cm.
It is possible to use any PVC tube of 125 mm diameter, any supply from us will be quoted separately.

INSTALLATION

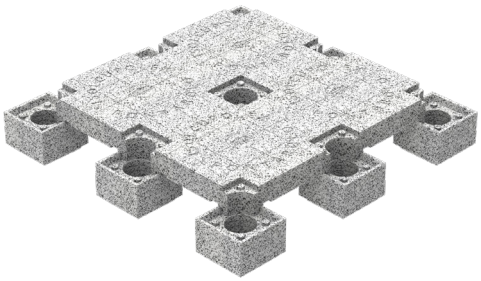
The IsolCupolex® system has different possible configurations.
The measures below refers to a system with a standard dome with an insulation thickness of 8 cm.

1. ISOLDOME TOPCROWN



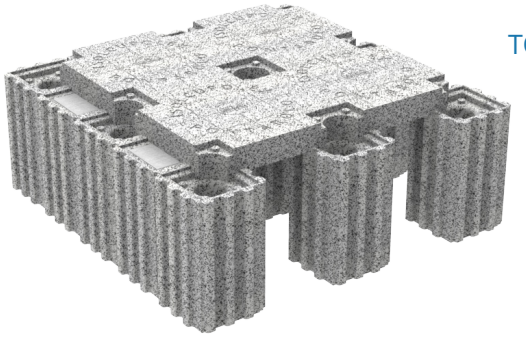
- 11 cm height
- To obtain a aerated insulated floor with a minimum thickness of 12,5 cm

2. ISOLDOME CUP CLOSURE



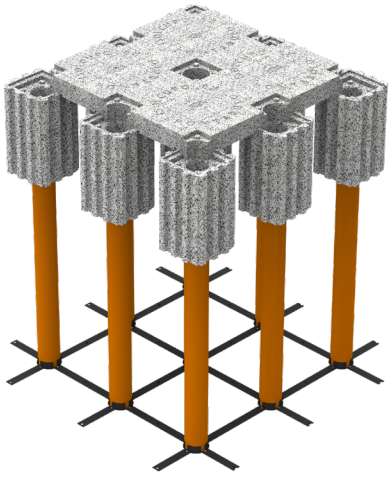
- No thermal bridges using the Leg Closure
- Small total thickness from 13,5 to 21 cm

3. ISOLDOME LEG CLOSURE BASE TOPCAP



- Heights From 23,5 to 78,5 cm
- Leg and top cap allow to close the aerated floor perimeter apertures
- Easy to adapt to any layout
- The constant insulation thickness guarantees optimal insulation
- The Base act as spacer for a proper installation

4. ISOLDOME LEG TUBE BASE



- Heights From 78,5 to 250 cm
- For heights above 78,5 cm there is no thermal bridge using Legs and Tubes

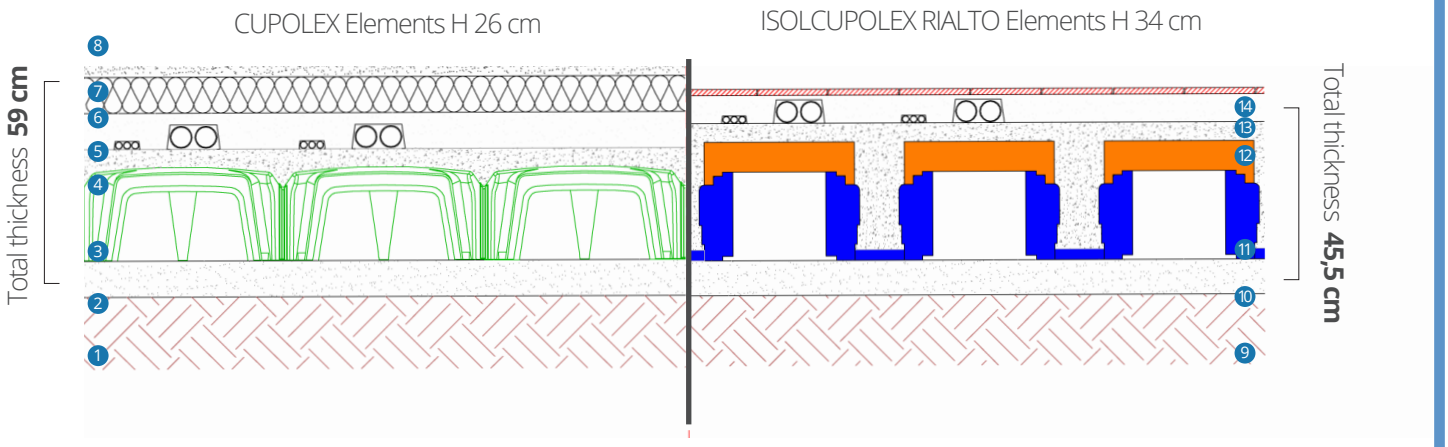
COMMON SLAB DESIGNS

The following table contains the required steel reinforcement indication for the most common applications with considered soil Winkler constant of 1kg/cm³ and 10 cm of lean concrete. Contact pressure has been calculated considering the acting load as evenly distributed load, a system height of 100 cm and an insulation thickness of 7,3 cm.

APPLICATION	DEAD LOAD (Kg/m²)	LIVE LOAD (Kg/m²)	SLAB THICKNESS (cm)	STEEL MESH	CONTACT PRESSURE (Kg/cm²)
RESIDENTIAL	200	200	5	ø 5/20x20	1,34
OFFICES	200	300	5	ø 5/20x20	1,57
GARAGES	300	700	6	ø 6/20x20	2,76
LIGHT INDUSTRIAL BUILDINGS	300	1200	7	ø 8/20x20	3,95
INDUSTRIAL BUILDINGS	300	1600	8	ø 8/15x15	4,91
REFRIGERATION BUILDINGS	300	7200	15	2 x ø 12/20x20	10,9

ISOLCUPOLEX® - TRADITIONAL AERATED FLOOR COMPARISON

26 cm of ventilation space



Legend

1. Soil
2. Lean concrete
3. Aerated floor Cupolex H26
4. Reinforced concrete floor slab topping (thickness=5cm)
5. Lightweight screed Isocal-type with passage of utilities (thickness=10cm)
6. XPS panel (thickness=10cm)
7. Reinforced screed (thickness=6cm)
8. Finishing
9. Soil
10. Lean concrete
11. Aerated floor IsolCupolex H34
12. Reinforced concrete floor slab topping (thickness=5cm)
13. Lightweight screed with passage of utilities (thickness=8cm)
14. Finishing

THERMAL PERFORMANCE (ISOLCUPOLEX® + SLAB)

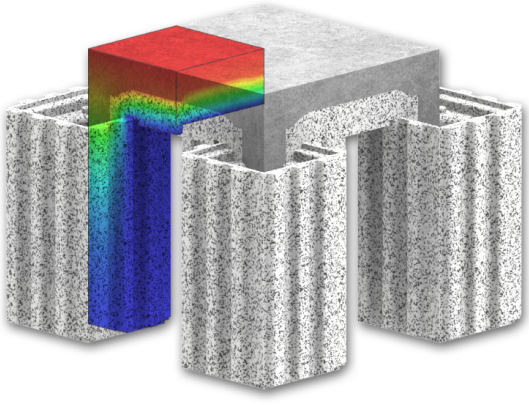
The following tables include the thermal transmittance value U_{eq}, for some configurations, considering the thermal bridge created by the concrete columns.

The following table refers to the ISOLDOME + CUP configuration, up to 25 cm height.

H IsolDome	H Ventilation	H_{tot} System	Transmittance U_{eq} with leg closure
8,5	2,5	11	0,0906
	5	13,5	0,1528
	7,5	16	0,1628
	10	18,5	0,1727
	12,5	21	0,2951

Table for heights higher than 25 cm, referring to the ISOLDOME + LEG configuration.

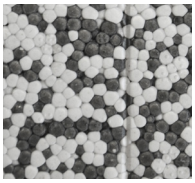
H Nominal IsolDome (cm)	H Leg (cm)	Correct trasmittance U_{eq} [W/(m² K)]	
		with leg closure	without leg closure
8,5 (H isolating 7,3)	15	0,4175	0,5049
	25	0,4308	0,4901
	40	0,4415	0,4678
	50	0,4449	0,4530
10,5 (H isolating 9,3)	15	0,3599	0,4360
	25	0,3726	0,4239
	40	0,3824	0,4052
	50	0,3854	0,3926
14,5 (H isolating 13,3)	15	0,2895	0,3542
	25	0,3004	0,3437
	40	0,3085	0,3278
	50	0,3111	0,3173
18,5 (H isolating 17,3)	15	0,2462	0,3000
	25	0,2558	0,2914
	40	0,2628	0,2786
	50	0,2651	0,2700



Temperatures pattern example obtained through a three-dimensional thermal analysis of the IsolCupolex® system.

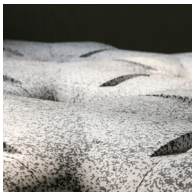
COMPOSITION: INNOVATIVE EPS

Twinpor™ is a new EPS composition formulated and tested by Pontarolo Engineering Spa with better performance: an optimal mix of white and "carbon black" EPS beads **which increases the insulating properties** of the products, leading to λ values similar to graphite polystyrene (GPS) overcoming its problematic installation when in direct solar exposition.



***λ_D= 0,0316 W/mK**

TWINPOR™



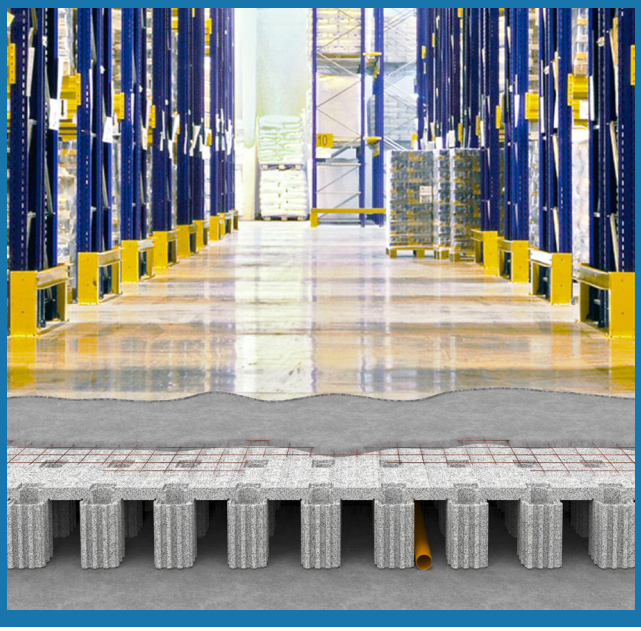
Its peculiar formulation gives EPS Twinpor™ a unique dichromatic black and white layout.

*Declared Thermal conductivity λ_D at 10°C for Twinpor.

ISOLCUPOLEX FOR FRIDGE BUILDINGS

With the insulated system ISOLCUPOLEX it is possible to create a ventilation space and an insulation layer, reducing the heating of the room, preventing from humidity formation underneath and creating a longlasting concrete structure.

- Insulation and ventilation space in only one step, reducing time and cost of construction
- Dry and durable pavement thanks to ventilation that removes humidity, preventing all damages due to water freezing
- High load bearing capacity with special insulating elements on the feet able to bear up to 30.000 kg/m2, preventing any floor deformation



HIGH HUMIDITY OR LOW VENTILATION?

ISOLCUPOLEX® PLUS **is THE BEST SOLUTION!**

Plastic dome (made in polypropylene) with built-in insulation designed by Pontarolo Engineering spa , **prevents the infiltration of humidity and harmful gases (i. e. Radon)**, even in conditions of high humidity or low ventilation. Available in different insulation thicknesses (up to 30cm) and leg closures.