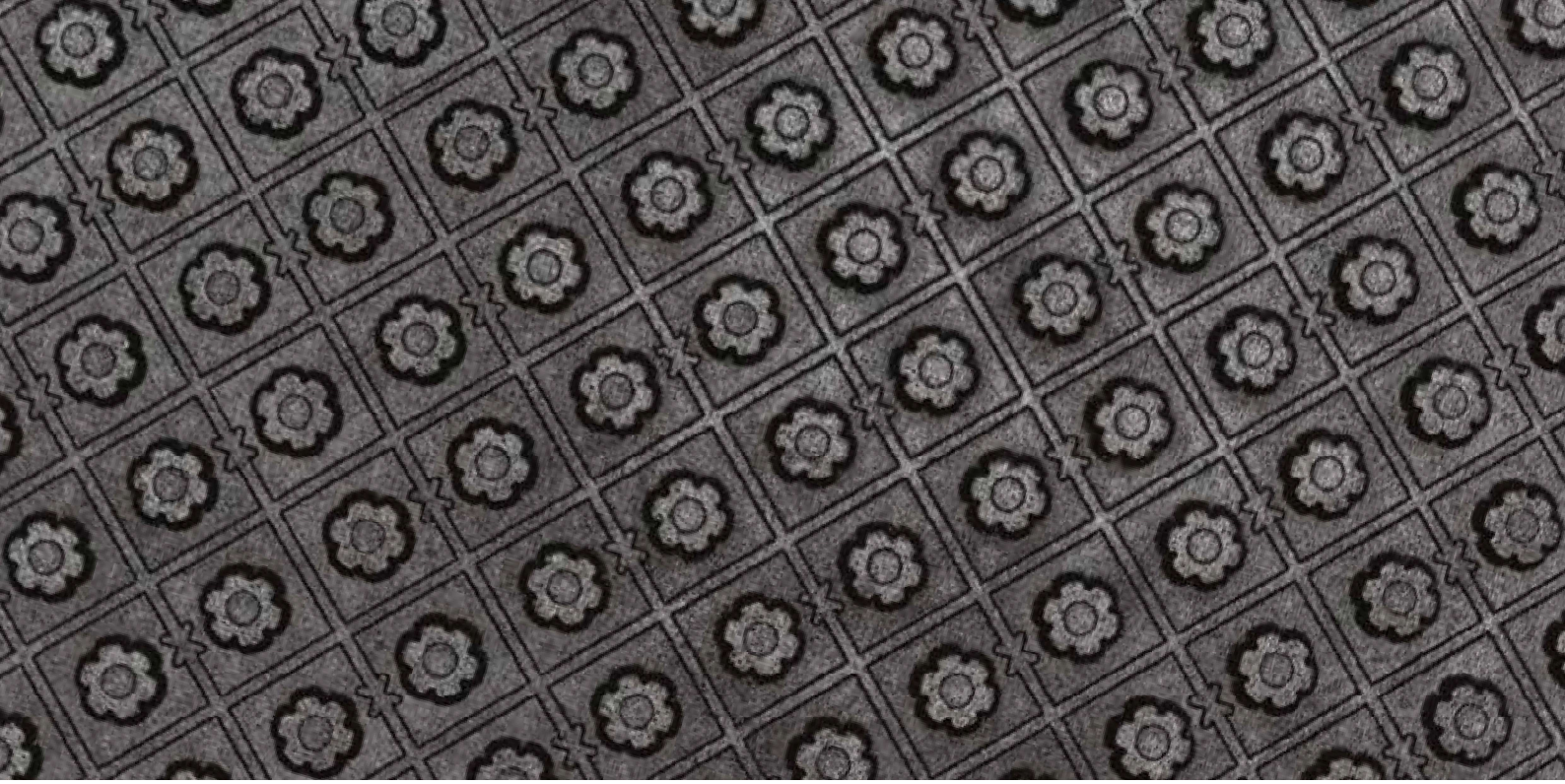
TIEMME

ORIGINAL ITALIAN TRADEMARK

TIEMME SLIM
LOW BLACK
DRY

Low inertia solutions
for high-performance buildings

EN



LOW BLACK SYSTEM

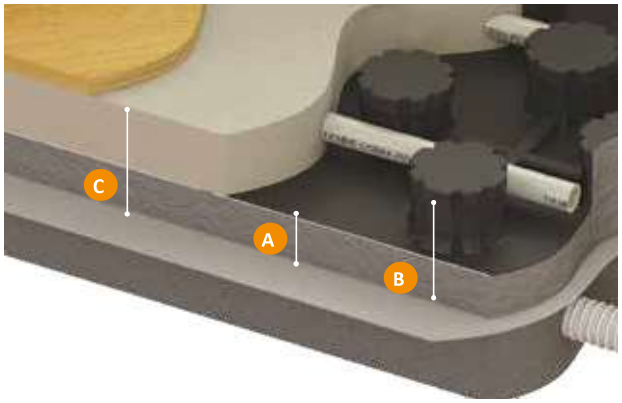
Low Black System is the innovative Tiemme system created to meet the demand for low thermal inertia radiant systems. The wide range of thicknesses allows the application both in new buildings, yet ensuring the thermal resistance values required by UNI EN 1264, and during renovations when the containment of the overall dimension is priority. Made of sintered expanded polystyrene with graphite and high mechanical resistance (EPS 300), it is particularly suitable for the coupling with special screeds lowered up to 1 cm above the pipe. The panel is equipped with a 170 µm HIPS thermosealed polystyrene protection layer as required by the current legislation. Coupled with 16x2 and 17x2 pipes, it is designed to deliver high flow rates and low pressure drops.

LOW BLACK SYSTEM / EXTRA BENEFITS

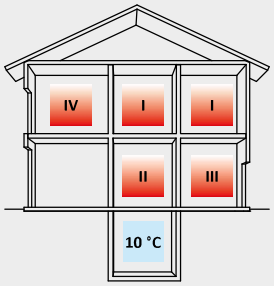
1. Low thermal inertia
2. High mechanical strength
3. Suitable for new constructions and renovations
4. Different thicknesses available
5. Insulation protection layers according to the UNI EN 1264 standard
6. Eps with graphite for high thermal insulation
7. Easy installation
8. Easy coupling of adjoining panels

LOW BLACK / WHAT DOES IT COME WITH?

1 Skirting boards
2 Coating
3 Screed
4 Tube
5 Thermally insulating panel
6 Perimeter strip
7 PE foil



Codes	Dimensions [mm]		
	A	B	C
450 0567	12	31	41
450 0568	19	38	48
450 0569	34	53	54

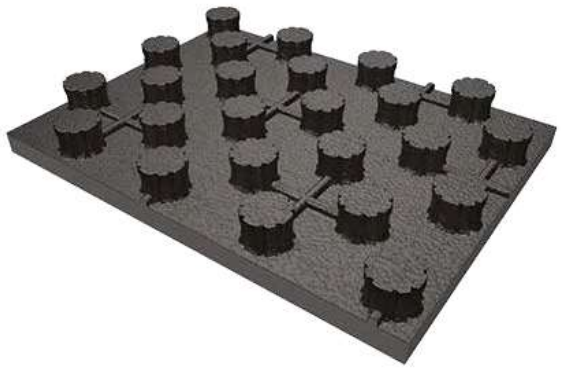


THICKNESS COMPLYING TO THE UNI EN 1264:2009 STANDARD	CASE I	CASE II and III
Size mm	**19 mm**	**34 mm**
Panel code	450 0568	450 0569
CASE IV [External T ≥ 0 °C]	CASE IV [-5°C ≤ External T < 0 °C]	CASE IV [-15°C ≤ External T <-5 °C]
34 mm	**-**	**-**
450 0569	-	-

LOW BLACK / PANEL

4518GRF

Insulation for radiant floor systems, made of closed-cell expanded polystyrene added with graphite, coupled with a polystyrene laminate heat sealed HIPS 170 µm, CE marked, capable of radiating systems powered by water for heating and cooling integrated into structures according to UNI EN 1264.



Codes

Codes	Thickness	R.C. 10%	m²/Packaging	Panels/ Packaging
450 0567	12 mm	300 kPa	23,52	21
450 0568	19 mm	300 kPa	17,92	16
450 0569	34 mm	300 kPa	12,32	11

Dimensional characteristics

FEATURE	THICKNESS			CHARACTERISTIC	VALUE
Insulation thickness [mm]	12	19	34	Clevis height [mm]	19
Calculated average effective thickness sins [mm]	17	24	39	Clevis spacing [mm]	50
Total panel thickness [mm]	31	38	53	Heating tube diameter [mm]	16- 17
Pcs per package [no.]	21	16	11	Panel useful dimensions [mm]	1400 x 800
m² per package [m²]	23,52	17,92	12,32	Panel total dimensions [mm]	1425 x 825
Packaging type	BOX	BOX	BOX	Panel useful surface [m²]	1,12

Technical specifications

CHARACTERISTICS	STANDARD REFERENCE	EPS TYPE	THICKNESS			CLASS
			12	19	34	
Thermal resistance on average effective thickness $R_{\lambda,ins}$ [m²K/W]	UNI EN 1264-3:09	300	0,55	0,77	1,26	
Declared thermal conductivity	UNI EN 13163:17	300	0,031			0,031
Durability of thermal conductivity against heat, weather conditions, degradation, wear and tear	UNI EN 13163:17	300	The thermal conductivity of EPS does not change over time			
Fire resistance rating	EN ISO 11925-2:10 + EC1:11	300	EUROCLASSE- E- UNI EN 13501:11			E
Durability of reaction to fire against heat, weather conditions, degradation, wear and tear	UNI EN 13163:17	300	The fire reaction of EPS does not change over time			E
Compressive strength at 10% deformation σ_{10} [KPa]	UNI EN 826:13	300	300			CS(10)300
Long-term water absorption W_{lt} [%]	UNI EN 12087:13	300	5			WL(T)5
Dimensional tolerance thickness d_N [mm]	UNI EN 823:13	300	± 2			T(2)
Resistance to water vapour diffusion of EPS µ [num]	UNI EN 12086:13	300	100-160			Z 100-160
Resistance to water vapour diffusion of HIPS µ [num]	UNI EN 12086:13	HIPS	10.000			===

Item Specifications

Insulating panel for underfloor radiant systems according to the UNI EN 1264 standard, made of sintered expanded polystyrene with closed cells EPS 300, additivated with graphite, coupled with a protective layer in thermally welded laminated polystyrene HIPS 170 µm, CE marked. It can be combined with ultra-low screeds up to 0.8 cm above the pipe (follow manufacturer's instructions). 5 cm multiple steps for the 16x2mm and 17x2mm pipes. The panel complies with the UNI EN 13163: 2009 standard and is CE marked, complying with the requirements in the guidelines for the insulation of underfloor systems with Euro fire reaction class E, according to EN 13501-1. Plan dimensions 1400 x 800 mm. Insulation thicknesses available: 12mm with thermal resistance according to UNI-EN 1264 0.55 m2K / W, 19 mm with thermal resistance according to UNI EN 1264 of 0.77 m2K / W and 34 mm with thermal resistance according to UNI EN 1264 1, 26 m2K / W. Thermal conductivity 0.031 W / (m K) and compressive strength at 10% deformation of 300 kPa.

TIEMME
ORIGINAL ITALIAN TRADEMARK

TIEMME, INNOVATION FOR A STEADY GROWTH

Tiemme Raccorderie is an international leader in the production and marketing of plumbing and heating components. Experience, innovative capacity, creativity and exclusive Made in Italy production, tradition and culture, attentive customer care and environmental consciousness are the key values from which Tiemme creates solutions for plumbing and heating system engineering, in a perfect mix of technical competence and top material quality. That allowed Tiemme to develop through the years an extensive catalogue of products introducing itself to the world of systems engineering as an “all-in-one supplier”, able to meet the most diverse demands of the plumbing and heating industry. Tiemme prides itself in keeping the entire production chain on national territory so as to ensure high quality, unquestionable safety and reliability of its products and systems Each year, Tiemme also invests considerable resources in the research and development of new solutions so as to anticipate the requests of an increasingly global market.4,000,000 metres of PE-x extruded oxygen barrier tube.

TIEMME - VIEW ON RENOVATION AND ENERGY REDEVELOPMENT

The renovation is an important opportunity to improve the energy performance of your home, to make it more efficient and therefore reduce the consumption of plant management.
An efficient renovation means replacing the heat generator and the old radiator heating system with more innovative solutions and higher performance.
Interventions of this kind are encouraged by providing tax benefits for the tax payers in the current regulatory framework. We will now consider a few interventions from a structural point of view, such as: structural consolidation, moisture infiltration inside the walls, windows replacement, floor loading capacity and its seismic adaptation.
TIEMME offers a very wide range of heating systems: underfloor and ceiling heating and cooling systems specifically developed to meet all the needs of any building under renovation.
A plant that is perfectly integrated in the environment, today more than in the past- that is our very goal.

NZEB

The buildings designed with high quality thermal insulation standards, in line with the European directives (which impose the execution **of "nearly zero energy" construction projects by 2020) will benefit the most from our winter and summer air conditioning solutions thanks to the wall-, ceiling- or floor-radiant system (low thermal inertia).**
A house that follows today's energy standards should be featuring:

- reduced energy requirements for summer and winter air conditioning;
- discontinuous and time-limited power demand.

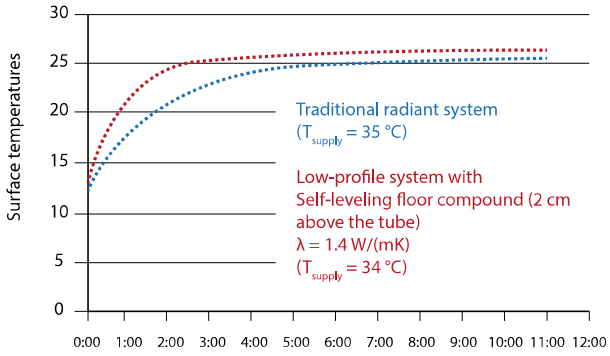
Radiant systems with low-thickness screeds prove to be the best solution to adopt, as they are characterised by reduced thermal inertia and reduced set-up times.

The regulatory framework is very clear and subsequently, the world of renovations and upgrading proceeds towards low-consumption and high-performance buildings, which is why TIEMME is providing a wide range of floor and ceiling heating and cooling systems especially designed to meet specific needs of new and renovated buildings. Tiemme technical department is ready to fulfil your requirements by offering the best solution according to your project.

Evaluation of inertia in radiant systems

In physics, and in mechanics particularly, the inertia of a body is the property that determines the resistance to changes in the state of motion, and is qualified by the inertial mass. Applying this concept to radiant systems is complex because there are many boundary conditions that affect its performance.
The factors that influence the inertia of the system are:

- Inertial temperature
- Temperature of the environment to be air-conditioned
- System placement (underfloor or outside)



A prompt and precise methodology for inertia evaluation is the execution of dynamic simulations to the finished elements on plant sections. An example of the obtainable results is shown in Figure 2 - the surface temperatures of two radiating systems as a function of time. For the low-profile system (shown in red in the figure), the time it takes to reach the desired surface temperature is less than 30 minutes. For the traditional system consisting of an insulator and a concrete screed it takes a longer time to reach the desired surface temperature.
This will have to be considered in the planning of the system regulation to ensure that the desired temperature is reached within 24 hours. The concept of thermal inertia is also important when the system is switched off: a low inertia system will take less time to cool off compared to a traditional system. The radiant systems with low profile screeds, and therefore low thermal inertia, allow an extremely effective room regulation and in perfect harmony with the new low-consumption building.