

# TIEMME SLIM

Renovation offers the ideal opportunity to improve the overall energy performance of your home by gaining in efficiency and reducing consumption. Under current legislation, these measures are encouraged by offering advantages to the taxpayer.

The Tiemme range includes underfloor heating and cooling systems developed ad hoc to meet the specific requirements of buildings undergoing renovation.

When the space available is extremely limited, the Tiemme Slim system is the perfect solution.

The panel available in the version with adhesive, to be applied straight onto the existing floor, or in white 0.05 cm EPS insulation, makes it possible to create very efficient low radiant systems. The unique shape of the panel allows the pipe to be laid orthogonally or diagonally at 45°, while coupling of the panels is guaranteed by overlapping of the lateral cleats.

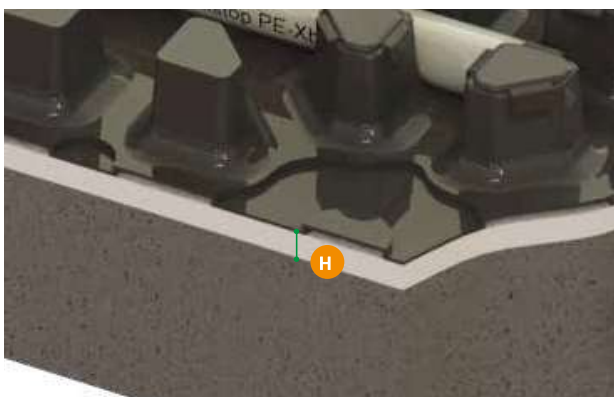
# TIEMME SLIM / HOW IS IT MADE?

Tiemme Slim is the innovative Tiemme system created to meet the demand for radiant systems with low thermal inertia and lower thicknesses. Designed to meet system requirements when renovating, thanks to reduced thickness and the possibility of bonding to the existing flooring, it is possible to create systems without having to resort to demolition, to improve the energy performance of existing buildings by working with a low temperature radiant system. It can be combined with 16x2mm and 17x2mm diameter pipes and guarantees excellent flow rates both when operating in winter and in summer, with low drops in pressure and, as a result, optimisation of the circulation pump. The cleat, which is optimised to guarantee perfect contact between the pipes and the screed, increases the yield of the system and even allows for diagonal installation at 45° without having to use clips. The pre-moulded sheet in thermoformed PS is extremely resistant to foot traffic thus optimising installation on site. Available in versions without self-adhesive insulation or with 5mm of white EPS 200 insulation, it can be adapted to meet diverse application needs.

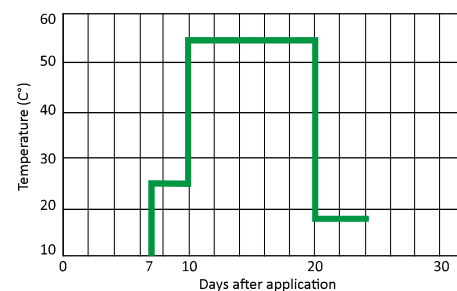


- 1 Covering
- 2 Lowered screed
- 3 Self-adhesive Tiemme Slim
- 4 Pipe
- 5 Flush system
- 6 Tiemme Slim 24,1 mm

Codes	Dimensions [mm]
	H
450 0641	19
450 0642	23,6



## Heat Cycle



- No net
- Joints every 20 ml



# TIEMME SLIM / PANEL

## 4519

Thermoformed panel with no heat insulation with raised cleats to block the pipe. Orthogonal installation pitch of 50 mm and multiples, diagonal installation pitch of 43/70 mm and multiples. Specific for renovations.

### Codes

Codes	Thickness	m <sup>2</sup> /Packaging	Panels/Packaging
450 0641	19 mm	17,92	11
450 0642	23,6 mm	22,40	11



### Technical specifications

Technical Specifications of the panel	Codes	
	450 0641	450 0642
Panel sizes [mm]	1400x800 Self-adhesive base	1400x800
Insulation thickness [mm]	-	5
Cleat thickness [mm]	18,0	18,0
Total panel thickness [mm]	19,0	23,6
Pipe thickness [mm]	16- 17	16- 17
Inter-axes [cm]	5 and multiples	5 and multiples
Thermal resistance on average effective thickness $R_{\lambda,ins}$ [m <sup>2</sup> K/W]	-	0,25
Thermoformed PS sheet thickness [mm]	1	0,6
Declared thermal conductivity [W/mK]	-	0,034
Fire reaction classification [EN 13501-1 Euroclass]	E	E
Panels per pack [no]	16	16
m <sup>2</sup> /pack	17,92	22,40

The Tiemme Slim radiant panel is the ideal product for building requalification interventions, combined with screeds lowered by 0.5/1 cm above the cleat, it makes it possible to create efficient systems both for heating and cooling environments.

The unique shape of the Tiemme Slim thermoformed sheet allows the screed to fully surround the surface of the pipe to optimise the system's performance. The pipe hooking system makes it possible to avoid using clips to fix the pipe, thus reducing installation times. The Tiemme Slim radiant panel allows pipes to be laid horizontally, vertically or diagonally at 45°, making the system perfectly flexible as it can even be laid in environments with irregular floorplans.



### Specification item

**450 0641 – Tiemme Slim thermoformed slab** in 1mm thick PS with lower adhesive layer protected by silicone film. Shaped cleats arranged for the installation of 16mm and 17mm diameter pipes, with multiple inter-axes of 5 cm when laid at 90° and multiple inter-axes of 7.1 cm when laid at 45°; cleats with undercuts for laying pipes without the aid of fixing clips; panel has ridges to minimise contact between the piping and the insulation and maximise contact with the screed. The PS film protrudes by 5cm via a double row of cleats on two sides of the panel so that the slabs can be interlocked and coupled as required by UNI EN 1264. Waterproof film ideal for liquid screeds. Plan dimensions of 1400 x 800 mm. Euroclass fire reaction classification E (EN 13501-1, Euroclass). Thickness 18mm + 1mm.

**450 0642 - Tiemme Slim thermoformed insulation panel** equipped with 5mm of white EPS200 insulation with declared thermal conductivity of 0.034 W/mK (UNI EN 13163, UNI EN 12667), protected on top by a film in PS obtained by thermoforming with a thickness of 6mm (UNI EN 1264-4); Shaped cleats arranged for the installation of 16mm and 17mm diameter pipes, with multiple inter-axes of 5 cm when laid at 90° and multiple inter-axes of 7.1 cm when laid at 45°; cleats with undercuts for laying pipes without the aid of fixing clips; panel has ridges to minimise contact between the piping and the insulation and maximise contact with the screed. The PS film protrudes by 5cm via a double row of cleats on two sides of the panel so that the slabs can be interlocked and coupled as required by UNI EN 1264. Waterproof film ideal for liquid screeds. Insulation in 5mm thick white EPS with compressive strength at 10% of 200kPa (EN 826). Plan dimensions of 1400 x 800 mm. Available insulation thicknesses: 5 mm with thermal resistance pursuant to UNI-EN 1264 of 0.25 m2K/W. Euroclass fire reaction classification E (EN 13501-1, Euroclass). Total thickness 23.6mm- (18+0, 6+5) mm.



## 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.

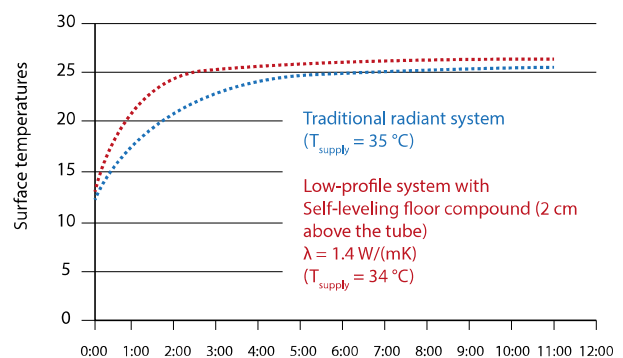


## Evaluation of inertia in radiant systems

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.