RADIANT RAISED ACCESS FLOOR

DIFFUSE

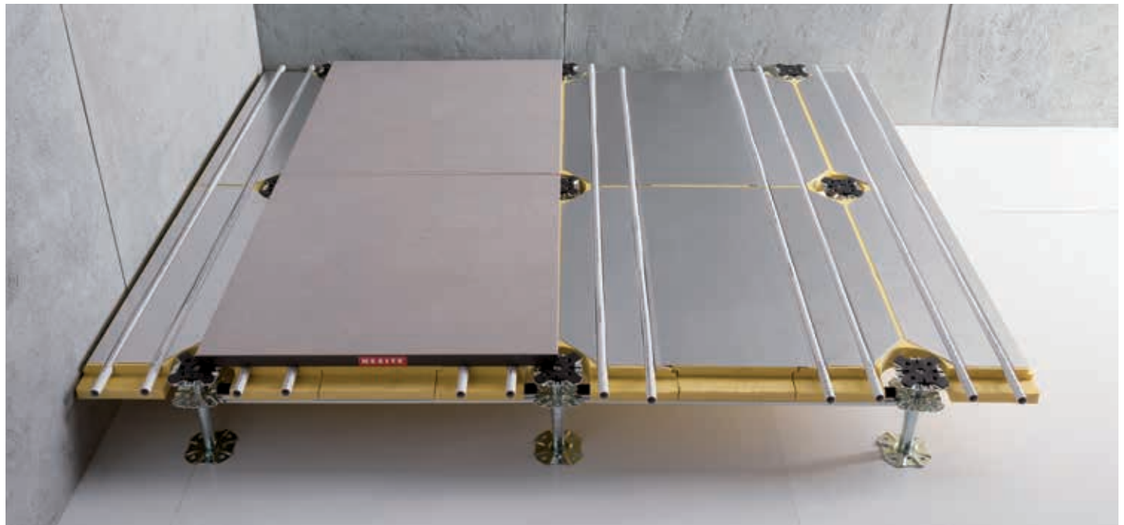
THE INNOVATIVE
RADIANT
RAISED ACCESS
FLOOR

NESITE®

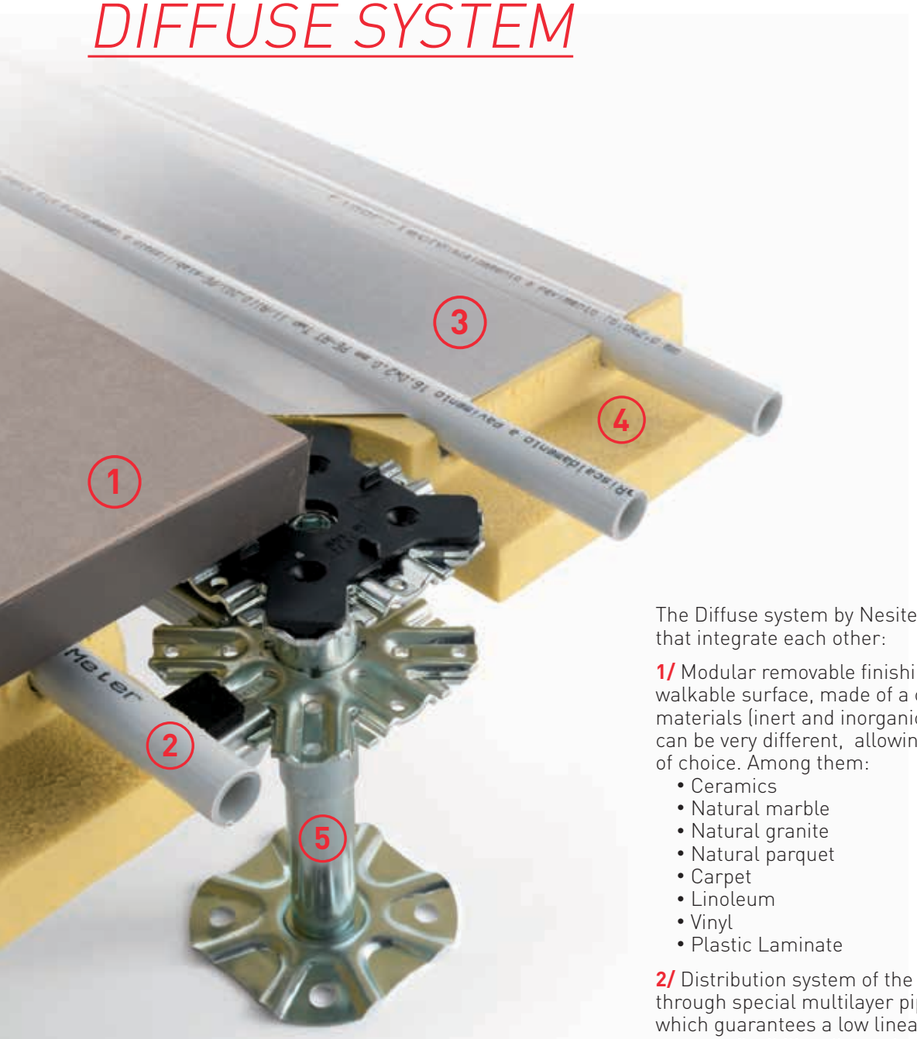
THE FEEL-GOOD SENSATION

DIFFUSE:
THE FULLY ACCESSIBLE RADIANT RAISED FLOOR

Diffuse is a dry radiant raised floor - completely accessible - therefore, it does not require any cement screed for the thermal regulation of the environment where it is installed. It is lightweight, fast and easy to install, can be immediately walked on and has a very low thermal inertia.
This latter feature , due to the reduced mass of dry systems, makes Diffuse very suitable for installation in areas where a quick response is needed both for heating in winter and cooling in summer.
The innovative radiant raised floor Diffuse by Nesite was developed in collaboration with FloorTech - a leader in the radiant systems industry - and designed to optimize the highest thermal efficiency, without sacrificing the characteristics that a raised floor must ensure, that is, its complete and easy accessibility, which gives the highest flexibility to the rooms where it is used.



DIFFUSE SYSTEM



The Diffuse system by Nesite is composed of elements that integrate each other:

1/ Modular removable finishing panels that make up the walkable surface, made of a core of various high density materials (inert and inorganic). The top covering material can be very different, allowing an extremely wide range of choice. Among them:

- Ceramics
- Natural marble
- Natural granite
- Natural parquet
- Carpet
- Linoleum
- Vinyl
- Plastic Laminate

2/ Distribution system of the exchange fluid (water) through special multilayer pipes (PE-RT/ALU/PE-RT) which guarantees a low linear expansion, easy installation, extreme flexibility, dimensional stability, impermeability to oxygen, resistance to corrosion and chemical agents, light weight.

3/ Patented radiant system that, in combination with the thermal insulation system, allows the diffusion toward the area to be air-conditioned.

4/ Special bottom covering that guarantees the perfect thermal insulation between the under floor and the walkable surface of the system.

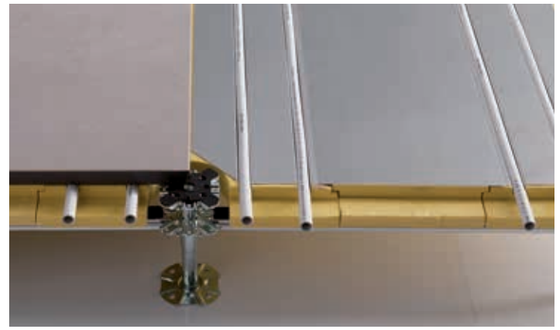
5/ Special structure that permits to raise together both the thermal insulating system and the finishing panels, thus allowing the full accessibility to the underfloor.

RAISING STRUCTURE

MP structure complete with stringers type L and/or M, fully steel galvanized, with special dual-head to support together both the finishing panels and the thermal insulating panels. Height adjustment from 14 to 65 cm just acting from the top, no need to move the radiant panels already installed. Its construction and design give to the system a higher resistance to loads compared to that obtainable with a standard slab.

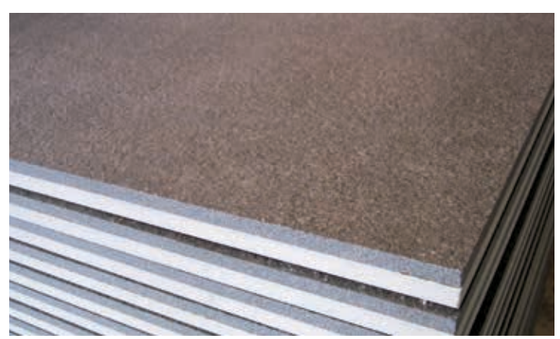
RADIANT PANELS

The fundamental element that gives the highest thermal efficiency to the system according to UNI-EN 1264 subtype B, is the lower thermal insulating system made of insulating panels in extruded foam polystyrene 300 kPa, 40 mm thick, to which a shaped aluminum foil 0.5 mm thick is coupled in order to allow the perfect fit with the heat exchanger tube (active element). The key element of the raised floor Diffuse by Nesite are the "neutral" radiant panels (i.e., without piping inside): these elements (removable and repositionable), while ensuring a perfect diffusion of heat (or cool), allow full accessibility to the sub-floor and its systems.



FINISHING PANELS

They are the removable panels that determine the aesthetic appearance of the floor. Can be constituted by different types of core (ceramic or calcium sulphate) and have the widest range of coating types. The panels of the series Twin Floor by Nesite well match the Diffuse system. With just 26 mm of thickness and a special multilayer all-ceramic composition, Twin Floor panels are recommended, as well as for their excellent mechanical resistance and waterproof, even for their excellent conductivity which guarantees the maximum thermal efficiency to the system Diffuse. The Twin Floor panels are top coated with ceramic 60x60 cm or 60x120 cm and allow the largest range of colors and types of finishing that the ceramics market is now able to offer.



Diffuse Raised Floor
→ Ceramic finish

DIFFUSE: HOW IT WORKS

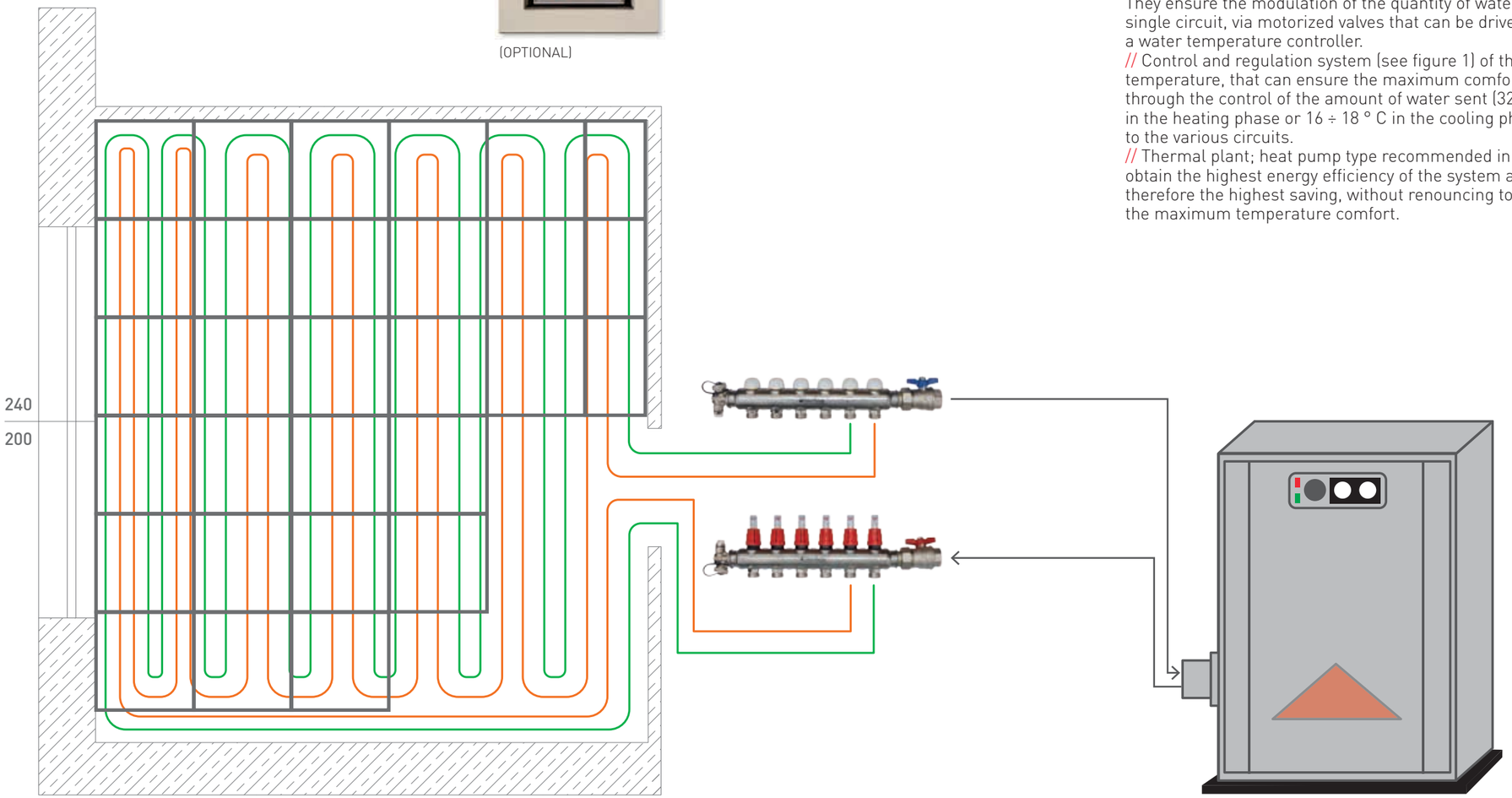
Diffuse is the maximum evolution of radiant raised access floors. It consists of special panels made of a sandwich formed by a patented aluminium shaped radiant body, enclosed between a lower polystyrene insulating layer and a top finish panel.
The special shaping of the aluminum foil allows the perfect fit of a multilayer pipe, thus enabling the highest thermal efficiency. The pipeline supplies the Diffuse system with water at a low temperature (up to 35 ° C in heating and 17 ° C in cooling) coming from a thermal plant.
The aluminum foil acts as a diffuser of the thermal power and ensures its uniform distribution. This allows the optimum air-conditioning of the area affected by Diffuse. Diffuse system can be composed of more than one water circuit (for medium-sized areas up to 12m ²/circuit) that converge to special manifolds with regulation driven by the room's air conditioning control system. Such composed system is than raised from the concrete slab by a special structure from 14 to 65 cm with adjustable height in order to create a cavity beneath the floor to collect other installations such as wiring, plumbing, telephone, computer and any fresh air system.

The **total accessibility** to said systems is granted through an easy operation: removing the finishing panels and the neutral diffuser panels (without piping), which are totally independent one from the other. This operation can be repeated as many times as necessary: without intervention of skilled personnel, without any connection to existing installations which limits the handling, without special tools for removal and repositioning of the panels.
Simplicity, ease and precision for the maximum comfort.
The **huge versatility** of Diffuse: light, easy to install and completely dry, applicable in any space where a raised floor can be installed, removable, with the possibility of replacing the finishing of the floor at any time with no need for masonry.

The **very low thermal inertia**: this is the characteristic of dry radiant systems due to their reduced mass; it allows to bring the room to the desired temperature in the shortest time possible, avoiding the long preheating times at ignition, as well as power and energy waste at switch off, that is typical of screed radiant systems having a much higher thermal inertia than Diffuse.
The **high thermal efficiency**: due to the choice of materials and the composition of the system, Diffuse ensures a significant reduction in consumption (-35%) with the consequent benefit in terms of energy saving, environmental protection and spending review.
These are just some of Diffuse' s peculiar features, the innovative radiant raised floor ideal for new buildings and renovations.

THE PLANT: STANDARD SCHEME

(OPTIONAL)

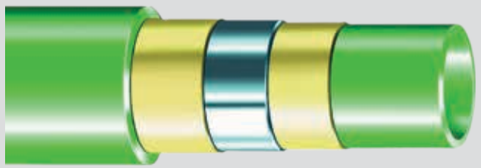


The standard plant is very easy since it is composed of few simple elements:
// Raised floor made of radiant panels Diffuse that, for the distribution of the exchange fluid (water), uses special multilayer pipes (see Figure 3) (PE-RT / ALU / PE-RT) able to guarantee a low linear expansion, ease of installation, flexibility and dimensional stability, impermeability to oxygen, corrosion resistance, as well as the highest heat exchange efficiency.
// Distribution manifolds (see Figure 2): they receive water from thermal plant and they can deliver it to a variable number of circuits, from 2 (minimum) to 8 (maximum). They ensure the modulation of the quantity of water to every single circuit, via motorized valves that can be driven by a water temperature controller.
// Control and regulation system (see figure 1) of the room's temperature, that can ensure the maximum comfort through the control of the amount of water sent (32 ÷ 38 °C in the heating phase or 16 ÷ 18 ° C in the cooling phase) to the various circuits.
// Thermal plant; heat pump type recommended in order to obtain the highest energy efficiency of the system and therefore the highest saving, without renouncing to the maximum temperature comfort.

1// CONTROLLER

2// MANIFOLDS

3// PIPE



DIFFUSE: ADVANTAGES AND SAVING

Radiant raised floors able to ensure good heating in winter and cooling in summer have very important advantages with respect to ventilation systems carrying out the same functions. Especially in the service sector, nowadays it is essential having a versatile accessible system, able to air condition large rooms evenly, giving them maximum flexibility for the distribution of space and easy regulation. In addition, the response speed of the system, the high thermal efficiency and the resulting reduced energy consumption are also very important elements.

The endless choice of finishes, from wood to marble, from ceramics to resilient finishes, makes the aesthetic choice as large as possible.

MAIN ADVANTAGES OF DIFFUSE SYSTEM

Totally accessible: each panel can be removed and repositioned without any constraint, thus allowing full accessibility to the underfloor in order to make maintenance and /or modifications to the systems (wires, plumbing, telephone and computer) or to vary the configuration of the rooms with the addition or new positioning of work-stations.

The use of the **advanced control system** (optional) allows the perfect thermal regulation of the system; it is able to compensate for abrupt changes of the room's temperature due to outside heat where, for example, there are large glass areas.

Energy saving
(more than 35%).

Optimal distribution of the temperature
(uniform heat up to approx. 2,5 m high).

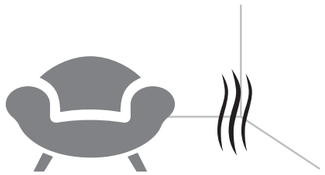
No architectural constraint
thanks to the total lack of heating elements in the room (e.g. fan coils or radiators), for the maximum freedom and purity of design.

No convective motion of air in the room,
no alteration of air quality and reduction in the amount of dust into the room.

HEATING COMFORT

With a radiant floor heating system operating at 26 ° to 27 °C you can obtain a homogeneous heat diffusion which leads the entire area at temperatures close to 22 °C in a very short time.
The heat is evenly distributed over the entire surface of the floor and is not concentrated in certain points.

The result: high and healthy comfort level.



With Diffuse, people get the maximum comfort thanks to the optimal distribution of temperature. The temperature in the room, indeed, is the closest possible to the ideal curve for the best comfort of human bodies.
With Diffuse, people can move in the room as wrapped in a pleasant "lukewarm" atmosphere, with the ideal temperature for the central part of the human body, slightly cooler in the upper part (head and shoulders) and slightly warmer in the lower part (knees, ankles and feet).
With Diffuse you never get that uncomfortable feeling of cold air flow that is typical of areas equipped with a forced ventilation system.

As can be seen from the figures below, with **Diffuse the distribution of comfort is the closest possible to the ideal one and it depends on the well-being feeling that the human body gets**.

Figure A refers to convection systems, i.e. fan coils which generate forced air flows (convective motions) in the room; they cause the accumulation of masses of warmer air in the highest part of the room with consequent comfort problems for people, also because of noise levels and movement of particles.

Figure B refers to systems with radiators that, even if they use the same convective motions of the previous case, they do not force the air movement; consequently, there is a more natural distribution of the air temperature. Nonetheless, they do not eliminate the accumulation of warm air upwards.

Figure C refers to the system Diffuse, which allows a distribution of air temperature in the room very close to the ideal temperature for the human body.
The maximum comfort and well-being, with Diffuse.

Figure A // convection systems

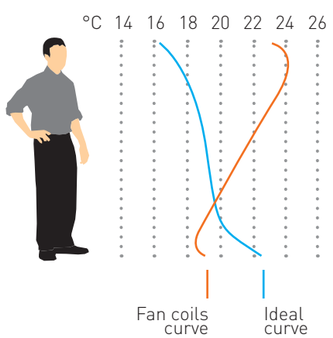


Figure B // systems with radiators

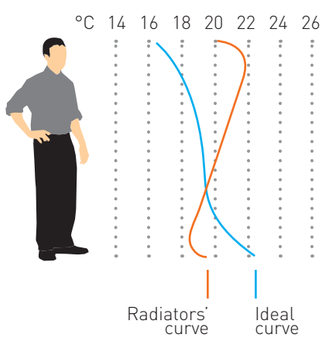
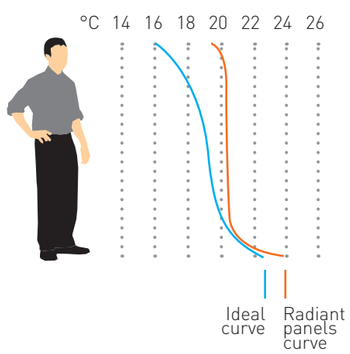


Figure C // Diffuse - maximum comfort

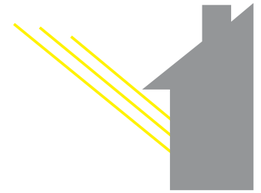


COOLING COMFORT

Diffuse ensures a high degree of comfort also in the cooling phase.

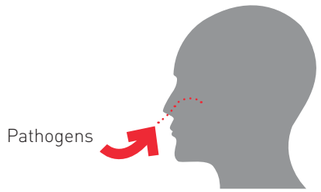
In this case the thermal plant will be composed of a heat pump unit capable of delivering both warm and cold water; in case of cooling the average water temperature will be of 17 ° C.

When used in cooling, it is advisable to use the radiant floor system in combination with a dehumidifying and air exchange system.



ADVANTAGES FOR THE RESPIRATORY SYSTEM

When air is less warm, it is also less dry, and that goes all for the benefit of the respiratory system.
In fact, the excessive heating of the air (typical of ventilation systems) with consequent excessive dryness, is a cause of inflammation of nasal membranes, of laryngitis and bronchitis.
The healthy function of the mucous membranes of the respiratory system (first natural barrier to pathogens) depends on the correct level of humidity you breathe.
For that reason we can define the **Diffuse** system as healthy and beneficial.



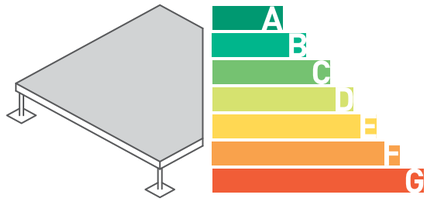
CERTIFICATIONS AND PATENTS

On the 24th of October 2013 was filed the **Italian patent** for the "**RAISED AND THERMO-REGULATED FLOORING MADE OF PREFABRICATED ELEMENTS**", whose heating and cooling performances have been certified at the **University of Stuttgart**.

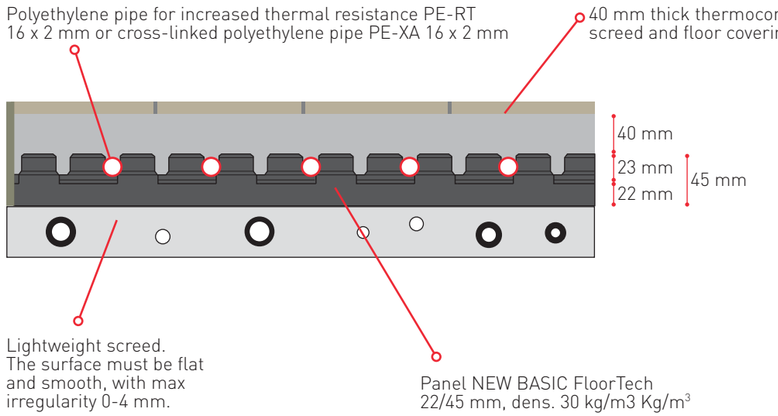
ADVANTAGES IN ENERGY SAVING

Thanks to the time response and the low temperature of supply, it is possible to save up to 15% energy more than a traditional floor on screed.

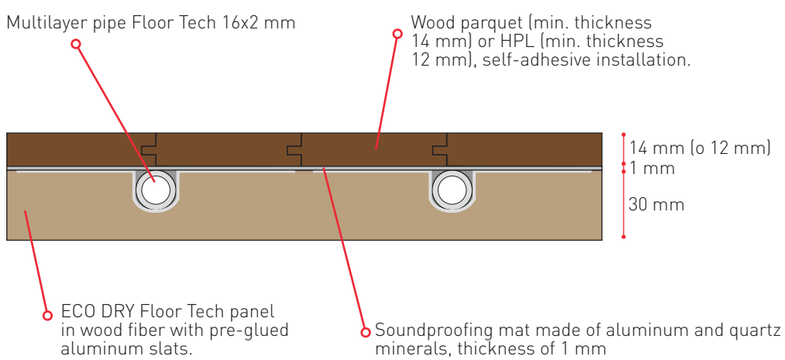
Moreover, thanks to the possibility of maintaining the air temperature at about 2 ° C lower than a ventilation system, with equal comfort, in an area varying in height from 3 to 5 meters, it is possible to reach an energy saving from 20 to 40%.



WET SYSTEM IN RELIEF



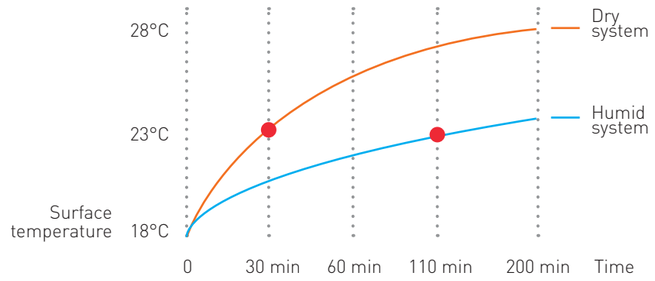
DRY SYSTEM ECO DRY BY FLOORTECH



SPEED OF RESPONSE AND OPTIMAL FUNCTIONING

A floor heating with cement screed takes several hours before being able to reach the desired temperature in the room. With the dry system by FloorTech it is possible to reach the desired temperature in **30 minutes**.
Dry systems, unlike traditional systems with cement screed, can be used even in ON-OFF modality.

Thanks to the materials' thermal conductivity and the reduced thickness, heat is distributed quickly and uniformly over the entire surface.



OPERATION WITH LOWER FLOW TEMPERATURE

In **dry** systems, the flow temperature is approx. 5 ° C lower than in screed systems.
This leads to significant energy saving.
In case of use with a heat pump, for each lower degree there is an increase of about 2.5% of the COP.
In this situation you can get an increase of 12% of the COP, that is, for example, a passage from COP 4 to COP 4.48 with the same heat pump.

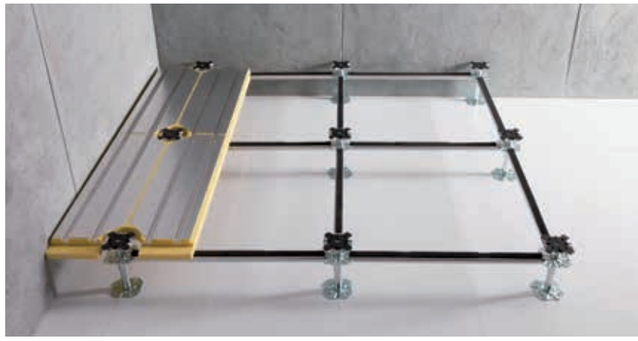
RAPIDITY OF INSTALLATION

Thanks to the constructive principle of dry systems, it is not necessary to wait for the drying time of the screed.
It is possible to install the floor system, complete with the top covering, in about one week against the 4-6 weeks required in case of a floor system with screed.

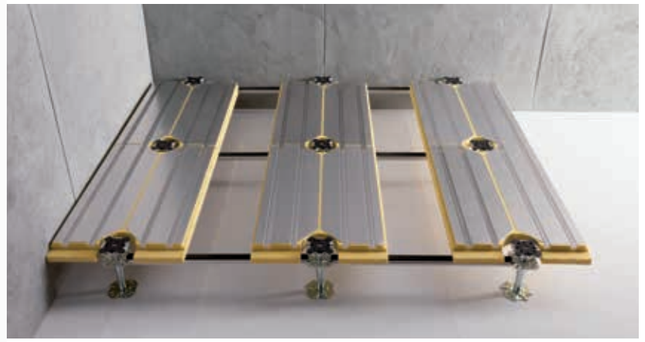
FAST AND EASY INSTALLATION

1/ Distribute the pedestals for module 60x60 cm approximately and connect them by snap-stringers on lower heads. Level the pedestals with theodolite laser, or bubble level and levelling rod, and apply the gaskets on stringers.

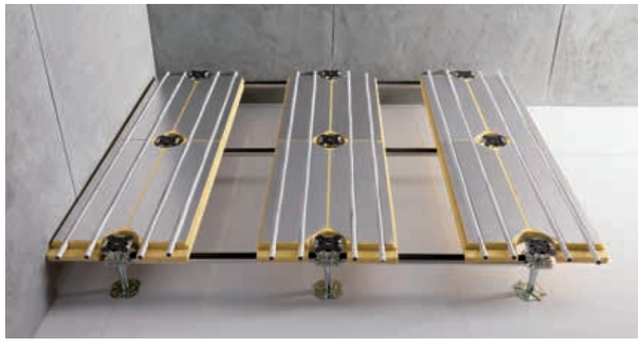
2/ Lay the "active" (with locations for piping) radiant panels aligned on the middle of the pedestal row.



3/ Complete the laying of "active" panels on all the pedestal rows.

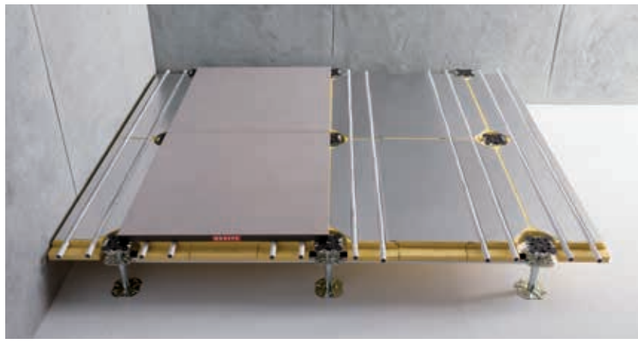


4/ Install the pipes in the cavities of the "active" panels and connect them with the manifolds.



5/ Lay the "neutral" radiant panels to close the underfloor cavity and to complete the radiant layer.

6/ Lay the finishing panels paying attention to correctly resting the panel on the four supporting pedestals. Cut and install the perimetral stringers and panels to complete the system.



DIFFUSE: THE AESTHETIC COMFORT

The radiant raised floor **Diffuse** can be realized with all the available coverings for raised floor, thus allowing the widest choice of types of finishes: from carpet to vinyl, from ceramics to natural marble, from parquet to natural granite, with colors, designs and styles that will satisfy the most demanding requirements.

Diffuse Raised Floor
→ Parquet finish

Diffuse Raised Floor
→ Ceramic finish

Diffuse Raised Floor
→ Ceramic finish

Diffuse Raised Floor
→ Parquet finish

FIELDS OF APPLICATION

The Diffuse system can be applied wherever there are the conditions for using a raised floor. It is recommended for areas subject to space reconfigurations (e.g. open space offices, banks, museums, public offices, etc.) because it is completely accessible and, therefore, allows various changes to the underfloor systems at any time and without having to resort to a costly demolition.

HOUSING RENOVATION

// drastic reduction in the realization times;
// simplification of the worksite's logistics;
// total costs very close to those of the wet solutions (with cement screed).

RENOVATION OF TERTIARY BUILDINGS

// drastic reduction in the realization times.

RESTRUCTURING OF SHOPS AND COMMERCIAL BUILDINGS

// drastic reduction in the realization times, resulting in rapid returns on investment due to a faster start-up of the business activity;
// simplification of the worksite's logistics: about 4 weeks, with consequent economic advantages resulting from a rapid re-opening;
// the most cost-effective solution.

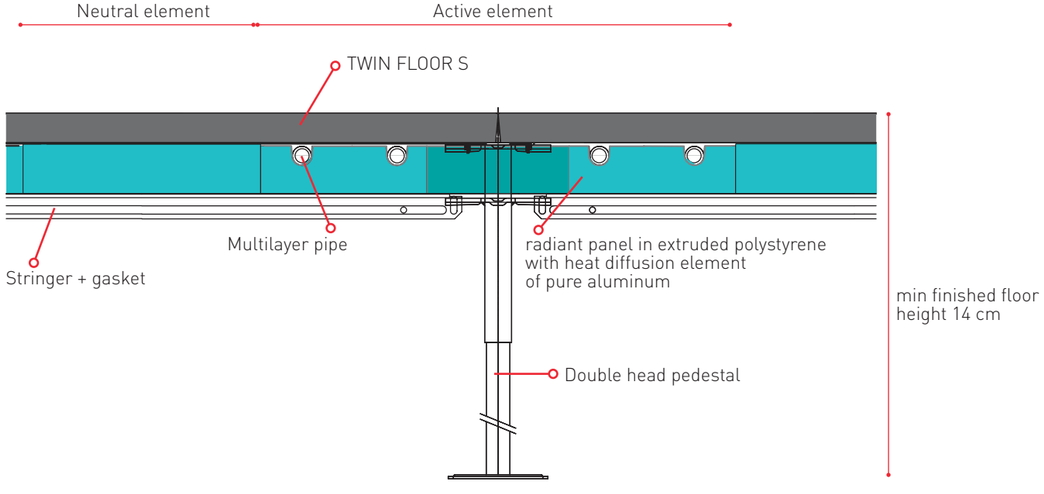
POSSIBLE INSTALLATION OUTDOORS

// Nesite technical department is available to offer solutions for installations of Diffuse system outdoors, which are able to ensure maximum efficiency and reliability.

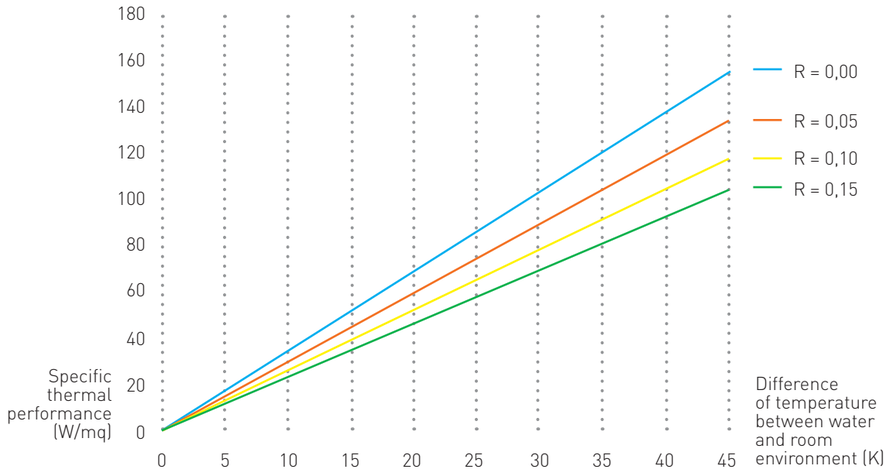
Diffuse Raised Floor
→ Ceramic finish

TECHNICAL CHARACTERISTICS

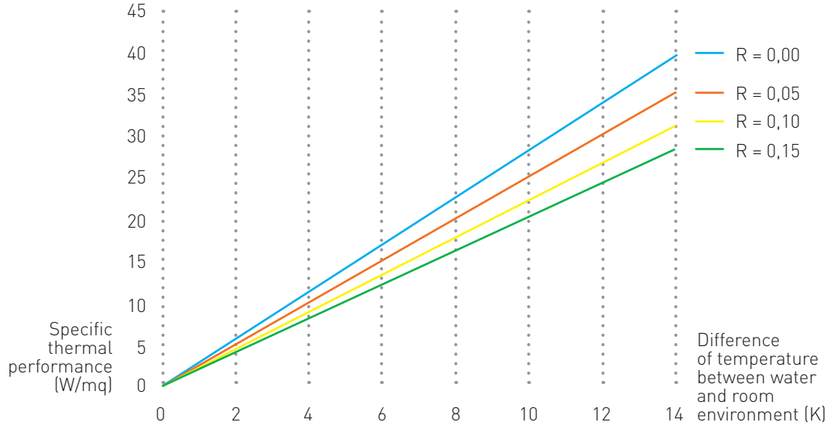
Radiant panel's total thickness	40 mm
Total thermal resistance of the insulation	1,212 m^2K/W minimum thermal resistance according to standard UNI-EN 1264 for heated underfloor spaces
Declared thermal conductivity (at 10°C)	0,033 W/mK UNI-EN 12667
Compression resistance of the insulation (compression to 10% of the thickness)	330 KPa UNI EN 826
Active element dimension	1220 x 400 mm
Neutral element dimension	1220 x 210 mm
Pipe diameter	FloorTech multilayer 16 x 2 mm
Particularity	Completely accessible radiant raised floor

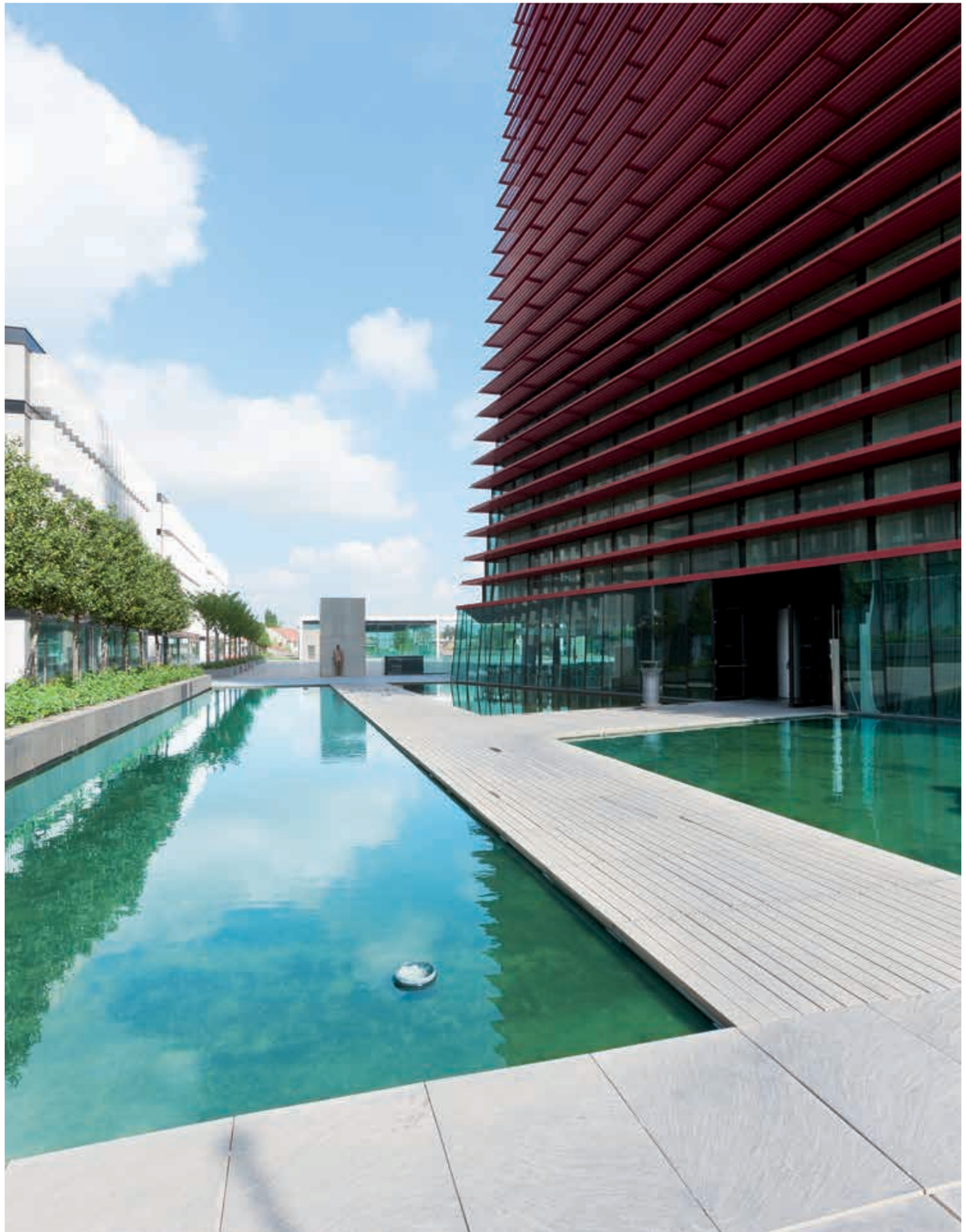


HEATING CHARACTERISTICS



COOLING CHARACTERISTICS





NESITE, ALWAYS LOOKING FOR NEW SOLUTIONS

Nesite is the reference brand in the raised floor industry.
Active on the market for 50 years, Nesite stands out
for its innovative design, the perfect engineering
and the Italian manufacture.
Nesite goal has always been providing innovative,
elegant and technically impeccable solutions; combined with
high performances and flexibility, those features make Nesite
raised floor a clear reference of its specific sector.
No other manufacturer offers such a wide choice
of products in the field of raised floors,
for both interior and exterior.

Nesite, the most innovative Italian raised floor company.

NESITE IS A BRAND OF

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