

RADIANT SYSTEMS

**Underfloor heating
and cooling systems**



MADE IN ITALY





Trullo - Alberobello (Italy)

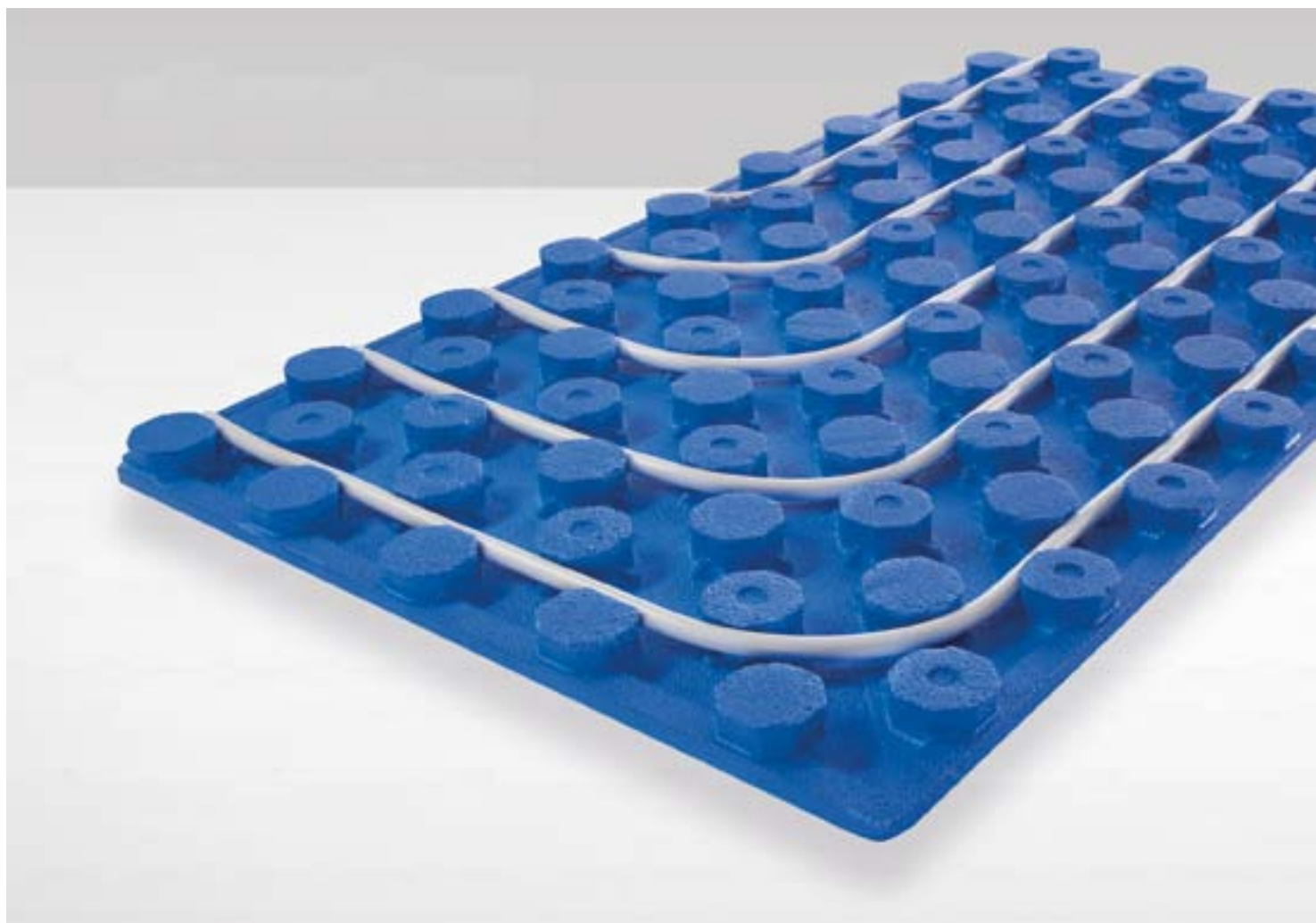
Modern technology
for every type of building



Look at the videos for radiant systems
<http://valsir.it/u/sistemiradianti>

Valsir delivers a series of packages that meet all the possible system requirements inside civil and industrial buildings and for the elimination of snow and ice from outdoor areas.

The use of a heat transfer fluid at low temperatures and the particular stratification of the heat in the room results in significant energy savings both in the heating and cooling mode.



The components of the Valsir radiant systems are made to high quality standards and in respect for the product and design standards of radiant systems.

MADE IN ITALY



State Archives - Mantua (Italy)

CHARACTERISTICS OF THE RADIANT SYSTEM

The advantages of using a radiant system

Floor heating today is without doubt the most technically valid heating solution for the residential, commercial and industrial sector.

The various system solutions available allow maximum flexibility and adaptability to all types of buildings and construction requirements.

- **Greater energy saving** as compared with traditional systems.
- **Uniform distribution** of room temperatures.
- **Less heat loss** as compared with a traditional heating system.
- **Greater thermal** well-being.
- **No limits** of an architectural nature.
- Great **reliability and flexibility** to all types of building and construction requirements.
- Elevated heating surface.
- No irritated throats thanks to the **optimum hygienic conditions**.
- **No dust deposits**.
- Elimination of mildew on walls and deterioration of wooden floors or window frames.





Lemon hot house - Puegnago del Garda (Italy)

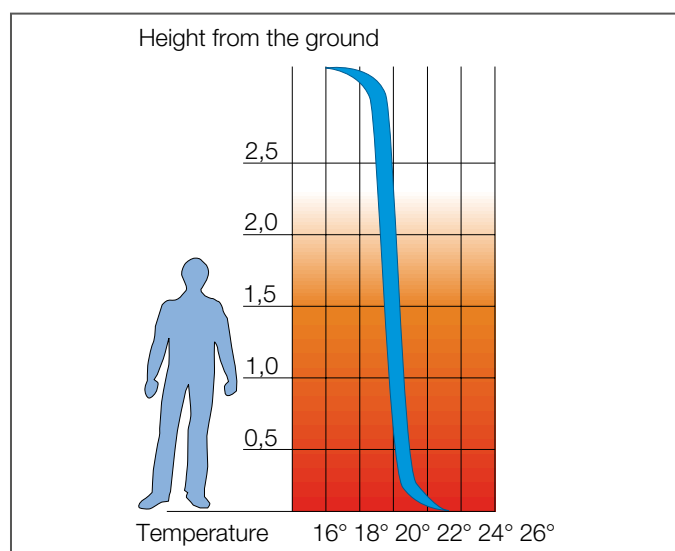
COMFORT AND MAXIMUM PERFORMANCE

Thermal well-being

The so-called “thermal well-being”, that is, the sensation of comfort, which is created within a room, is present when the temperature takes on a particular distribution in relation to the height of the room. Such a temperature distribution is defined as the ideal curve of thermal well-being.

To create “thermal well-being” there must be **slightly warmer areas near the floor and slightly cooler areas near the ceiling**. A temperature distribution curve can be traced for all heating systems.

With floor heating, the particular positioning of the **radiant panels** and the heat transfer by radiation generates a **temperature stratification, which is the closest to the ideal curve**.



Ideal temperature profile

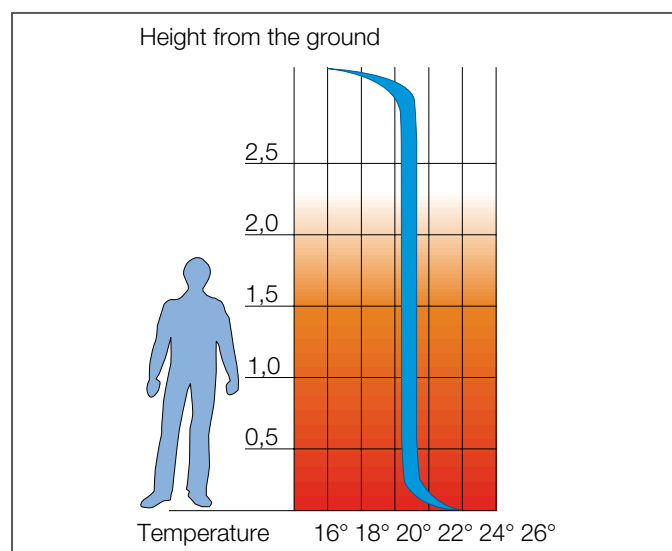
Hygienic conditions

Floor heating systems do not favour the formation of damp areas on the floor and therefore, conditions are not generated that would favour the formation of dust mites or bacteria or of mildew on the walls. Moreover, **floor heating operates at low temperatures and does not alter the relative humidity of the air**, maintaining the best conditions for personal health.

Aesthetical advantages

There are no architectural limits linked to the presence of radiators/fan heaters, hence there is **total freedom in furnishing a room**. Wall mildew is eliminated as is deterioration of wooden floors and window frames.

Underfloor heating systems allow the owner to make use of all available space; it is also valuable in the case of buildings of architectural and artistic importance where it is fundamental that the surroundings do not undergo change.



Temperature profile with floor heating



Carlisle United Football Stadium - Carlisle (England)

A MODERN ENVIRONMENTALLY FRIENDLY SYSTEM

Output

The thermal gradient that is generated with floor heating systems is such that **heat loss is less than in a traditional heating system.**

Unlike traditional systems, floor heating offers the possibility of recovering heat that is usually wasted due to the stratification effect of the air, which reaches higher temperatures near the ceiling; the higher the ceiling the greater the heat recovery.

With a floor heating system the condition of well-being achieved at an average room temperature, which is generally 1°C below the temperature achieved with traditional systems and therefore, at equal comfort, energy saving is possible.

Furthermore, the use of insulating panels to hold the pipe, significantly reduces heat loss and contributes to the increase of system output; traditional heating systems do not require such panels, from a design point of view, and therefore they are never used.



Energy saving

A modern system with **reduced environmental impact** as compared with traditional heating systems.

Radiant panel systems allow an average energy saving of 25% depending on the climatic conditions of the surroundings.

This important energy saving can be attributed to the fact that the large surface area of the floor is heated with a low temperature heating fluid.

It is therefore convenient to use heat sources whose performance increases as the temperature required decreases, such as heat pumps, condensation boilers, solar panels, heat recovery systems, zone heating systems.

THE IDEAL PIPE FOR RADIANT SYSTEMS

Heat performance

The presence of the aluminium layer, its thickness and position, result in excellent heat conductivity characteristics.

With Pexal® and Mixal® pipes it is possible to carry out floor heating systems with higher heat outputs.

In fact the greater conductance generates higher temperatures on the pipe surface as compared with all-plastic pipes (PE-X and PERT) and this advantage is reflected, for example in the possibility of obtaining relatively low supply temperatures.

The greater performance of Pexal® and Mixal® pipes compared with all-plastic pipes means greater system output at equal flow conditions. An example: the 16x2 Mixal® pipe has the same thermal output as the 17x2 PE-X pipe.

External layer

Mixal®: pipe in high-density polyethylene HDPE.
Pexal®: pipe in crosslinked polyethylene PE-Xb.

Binding layers

Two layers of adhesive bind the metal intermediate pipe to the two internal and external layers in polyethylene.

Intermediate layer

Pipe in aluminium alloy butt-welded lengthwise.

Internal layer

Pipe in crosslinked polyethylene PE-Xb.

Mechanical behaviour

The mechanical characteristics of the Pexal® and Mixal® pipes make them ideal for use in floor heating systems. The bending radius corresponds to 2.5 times the pipe diameter and the circular section at the bend remains constant.

The pipe, once bent, remains in the desired position like a metal pipe; hence **the use of anchor clips is not required** as with all-plastic pipes.

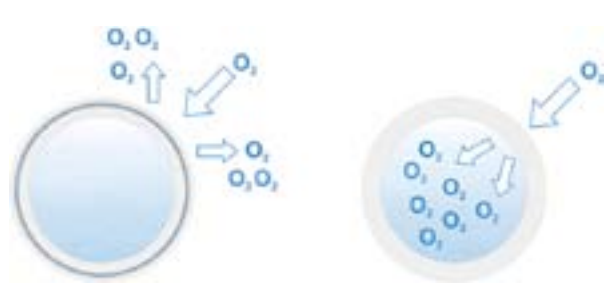
Barrier against oxygen and UV rays

The inner layer in aluminium acts as a perfect barrier against the passage of gaseous molecules thus avoiding the danger of corrosion due to oxygen infiltration and damage caused by exposure to UV rays.

The table shows a comparison of the oxygen transmission coefficients (Oxygen Transmission Rate) of aluminium, of EVOH (the material used as an oxygen barrier in all-plastic pipes) and of crosslinked polyethylene (PE-X).

Many PEX pipes sold today are manufactured with the oxygen barrier on the outside of the pipe. This layer is hence notably exposed, not only to superficial damages, but also to the negative effect of humidity, which drastically increases the porosity of the pipe.

Material	Oxygen transmission coefficient OTR at 25°C and 0%
Aluminium	0
EVOX barrier	0.21
PE-X	12,000



Pexal®/Mixel® Plastic pipe



V-ESSE SYSTEM

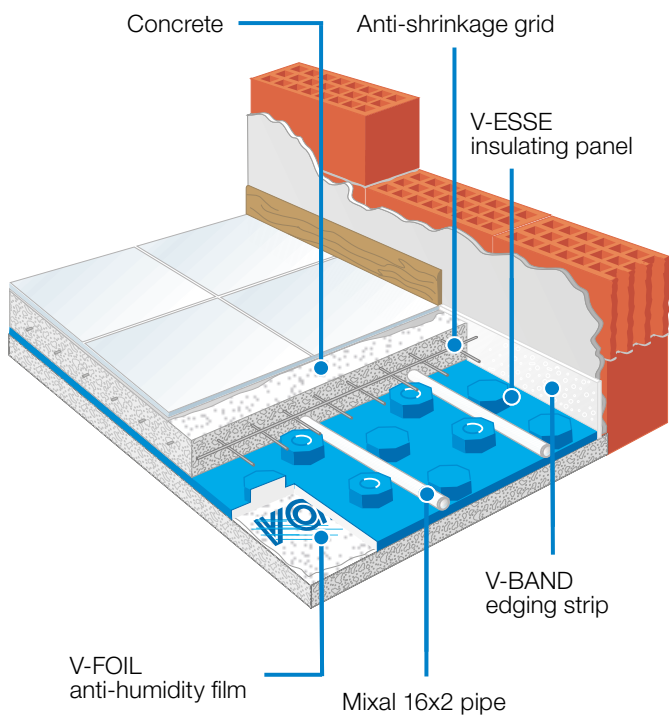
The heating and cooling system designed specifically for residential buildings and offices where the laying height is at least 90 mm.

By using the V-Acoustic multi-layer soundproof floor covering over screed of 100 kg/m², performance improvements of 28 dB are achieved.

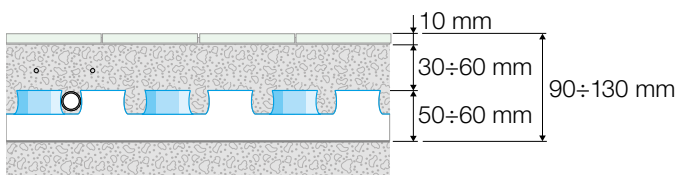
Noise reduction to impact sounds.

(UNI EN 12354-2 - App. C2)

$\Delta L_w > 28$ dB



Panel characteristics	Measurement unit	V-ESSE
Resistance	-	Class 150
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1350x750
Minimum pipe spacing	mm	75
Insulation thickness	mm	20 - 30
Total thickness	mm	50 - 60
Density	kg/m ³	30
Compressive strength	kPa	150
Flexural strength	kPa	250
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.034
Thermal resistivity	m ² K/W	0.8 - 1.1



V-ERRE SYSTEM

The heating and cooling system designed specifically for residential buildings and offices where the laying height is at least 72 mm.

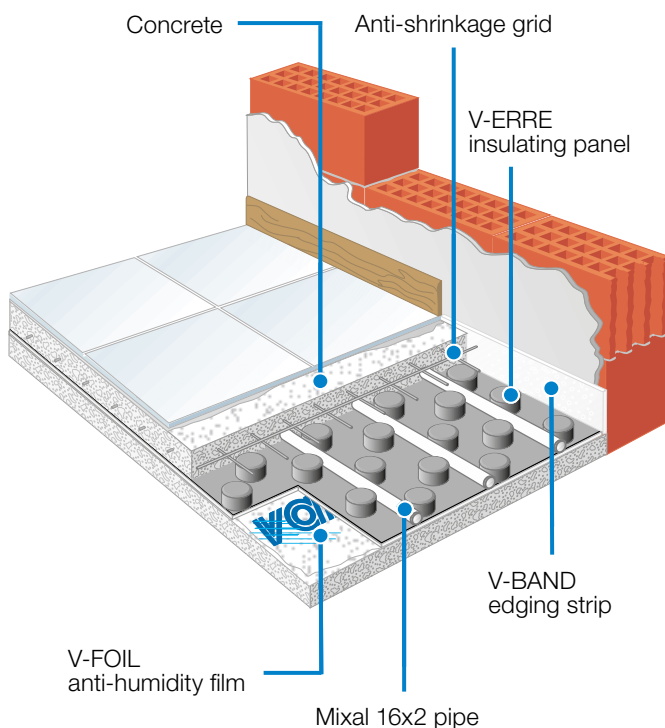
V-ERRE system is the ideal solution in buildings where laying space is limited but we don't want to forego the advantages of a Valsir floor heating and cooling system. The coupling of a rigid pocketed sheet with a molded polystyrene sheet allows the space occupied to be significantly reduced.

By using the V-Acoustic multi-layer soundproof floor covering over screed of 100 kg/m², performance improvements of 28 dB are achieved.

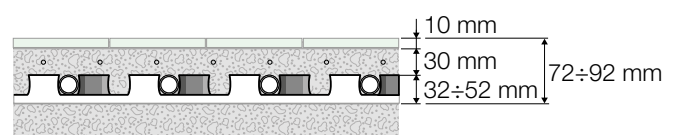
Noise reduction to impact sounds.

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$\Delta L_w > 28$ dB

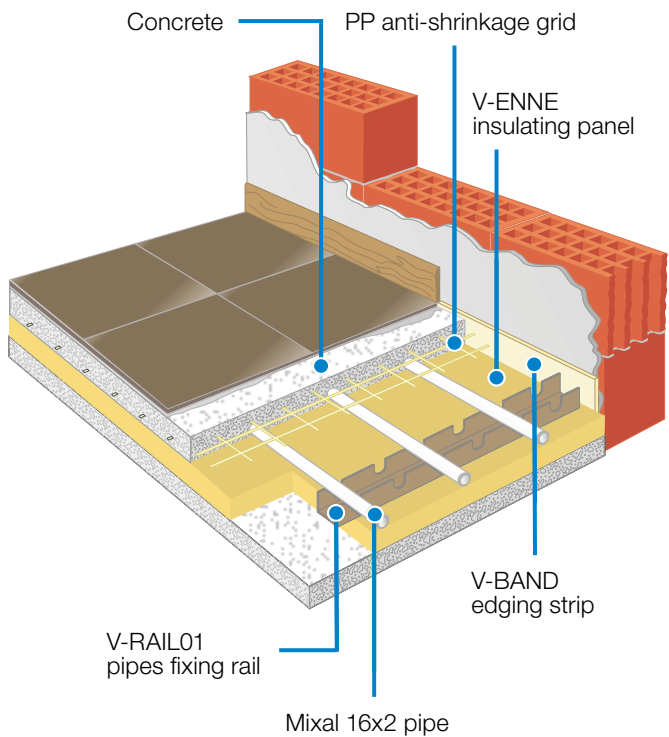


Panel characteristics	Measurement unit	V-ERRE
Resistance	-	Class 200 - 150
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1200x800
Minimum pipe spacing	mm	50
Insulation thickness	mm	10 - 20 - 30
Total thickness	mm	32 - 42 - 52
Density	kg/m ³	30 - 25
Compressive strength	kPa	200 - 150
Flexural strength	kPa	250 - 200
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.035
Thermal resistivity	m ² K/W	0.45 - 0.75 - 1.0

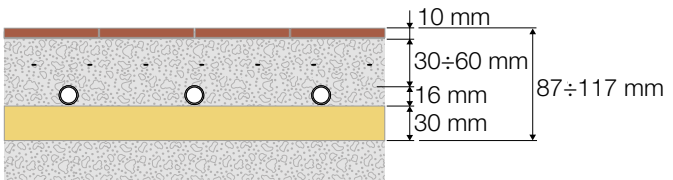


V-ENNE SYSTEM

The “eco-compatible” heating and cooling system that unites the advantages of components made of natural energy saving materials that are typical of radiant floor systems.



Panel characteristics	Measurement unit	V-ENNE
Resistance	-	Class 200
Surface type	-	Smooth
Panel working dimensions	mmxmm	1260x600
Insulation thickness	mm	30
Density	kg/m³	270
Compressive strength	kPa	200
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.049
Thermal resistivity	m²K/W	0.64

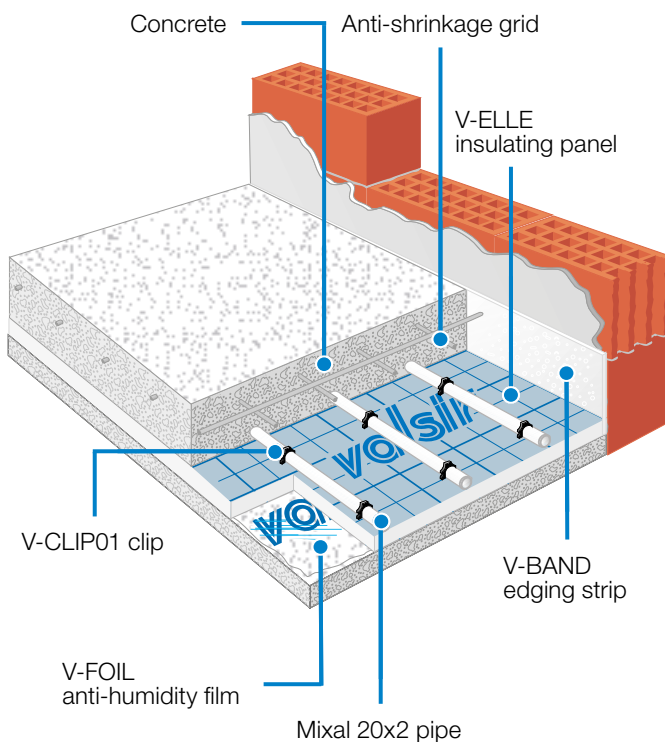


V-ELLE SYSTEM

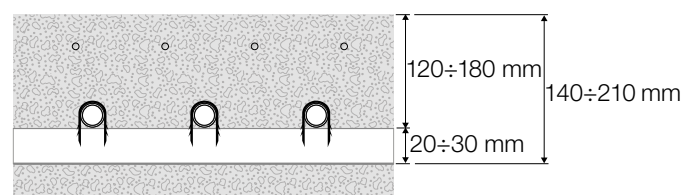
For industrial situations where an elevated load resistance is requested due to heavy vehicles or industrial machines.

The smooth panel enables rapid installation of the system where the Valsir multi-layer pipe is anchored with the use of hooked clips.

This solution is widely used for the elimination of ice and/or snow from external surfaces such as yards, ramps, helipads, car parks and also soccer and rugby fields (where the insulation layer is removed).



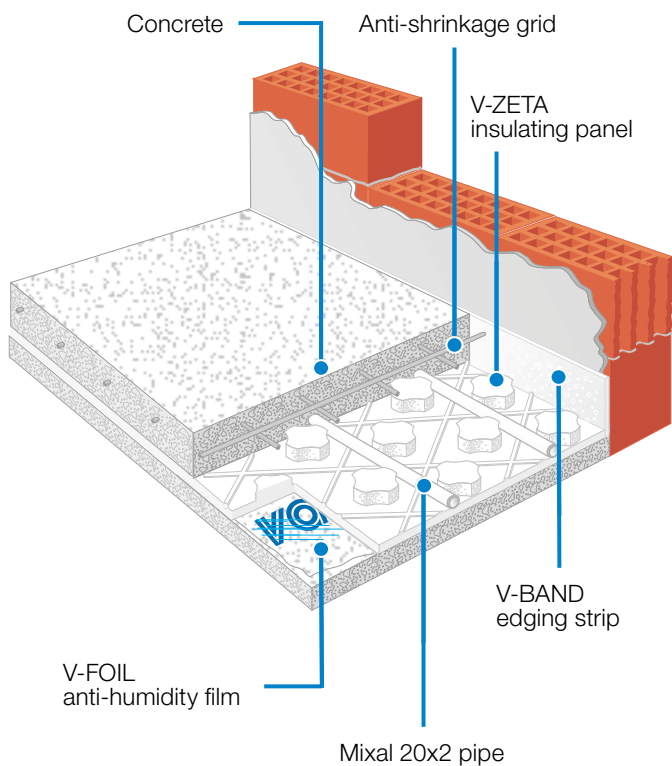
Panel characteristics	Measurement unit	V-ELLE
Resistance	-	Class 200 - 250
Surface type	-	Smooth
Panel working dimensions	mmxm	1000x12 - 1000x10
Total thickness	mm	20 - 30
Density	kg/m ³	30 - 40
Compressive strength	kPa	200 - 250
Flexural strength	kPa	250 - 350
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.033
Thermal resistivity	m ² K/W	0.6 - 0.9



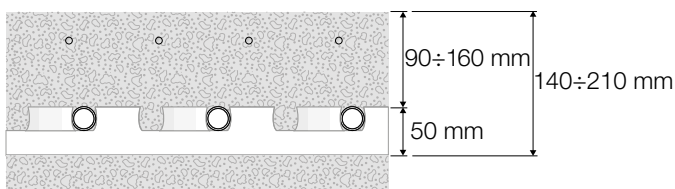
V-ZETA SYSTEM

The ideal system employed for the creation of floor heating systems in industrial buildings without renouncing the ease of installation of the Valsir multi-layer pipe on socketed panels.

It is an economically valid solution that is also suitable in residential buildings and offices.



Panel characteristics	Measurement unit	V-ZETA
Resistance	-	Class 200
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1200x750
Minimum pipe spacing	mm	75
Insulation thickness	mm	20
Total thickness	mm	50
Density	kg/m ³	30
Compressive strength	kPa	200
Flexural strength	kPa	250
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.035
Thermal resistivity	m ² K/W	0.8



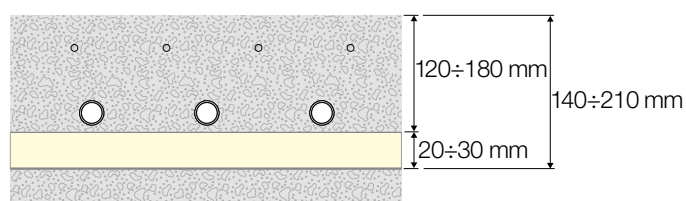
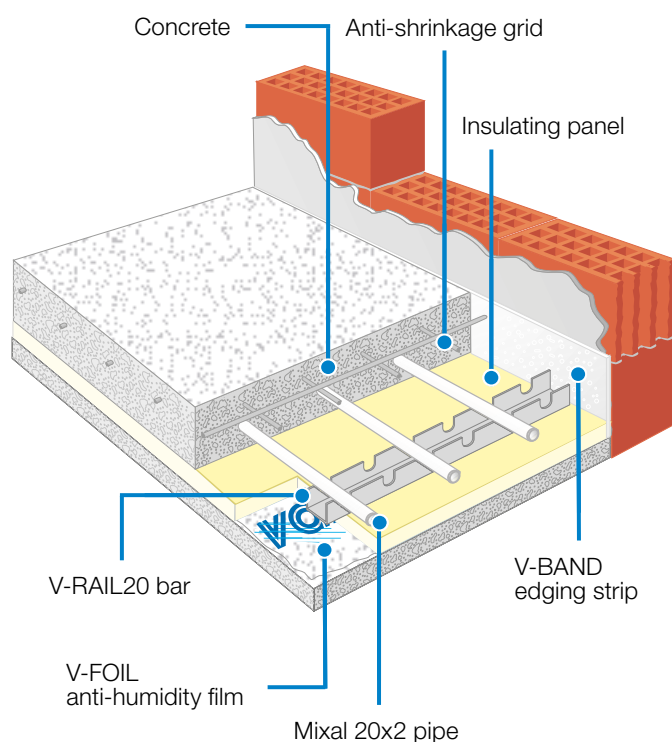
V-RAIL SYSTEM

This solution has been designed specifically for industrial environments in which the pipe is anchored to the surface by means of the special V-RAIL fixing bars made of a plastic material and equipped with biadhesive.

The use of the anchor bars results in an extremely simple and rapid installation of the heating loops.

This system can be used as an industrial type heating system without insulation panels by anchoring the V-RAIL02 pipe fixing bar directly to the floor slab.

It can also be employed as a snow/ice melting system for courtyards, car parks, athletic fields, etc. or as a system in geothermal applications.





Church of S. Nicola - Vibo Valentia (Italy)

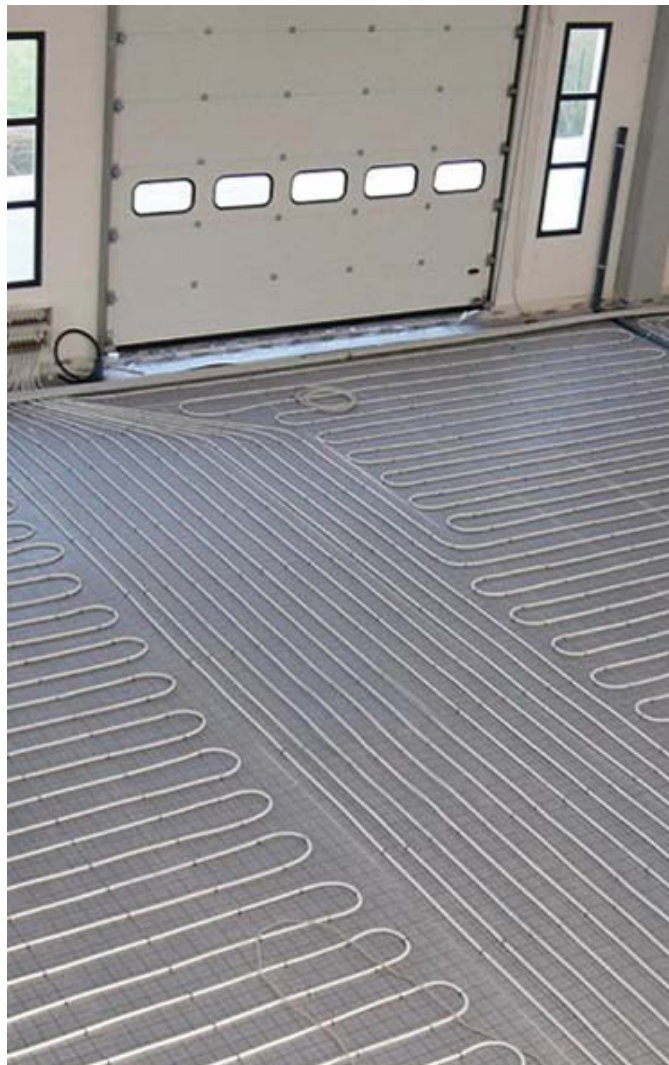
REFERENCES



Hotel Porec - Parenzo (Croatia)



Nursery in University of Salerno - Fisciano (Italy)



Plant - Sondrio (Italy)



Restaurant Josefina - Stockholm (Sweden)



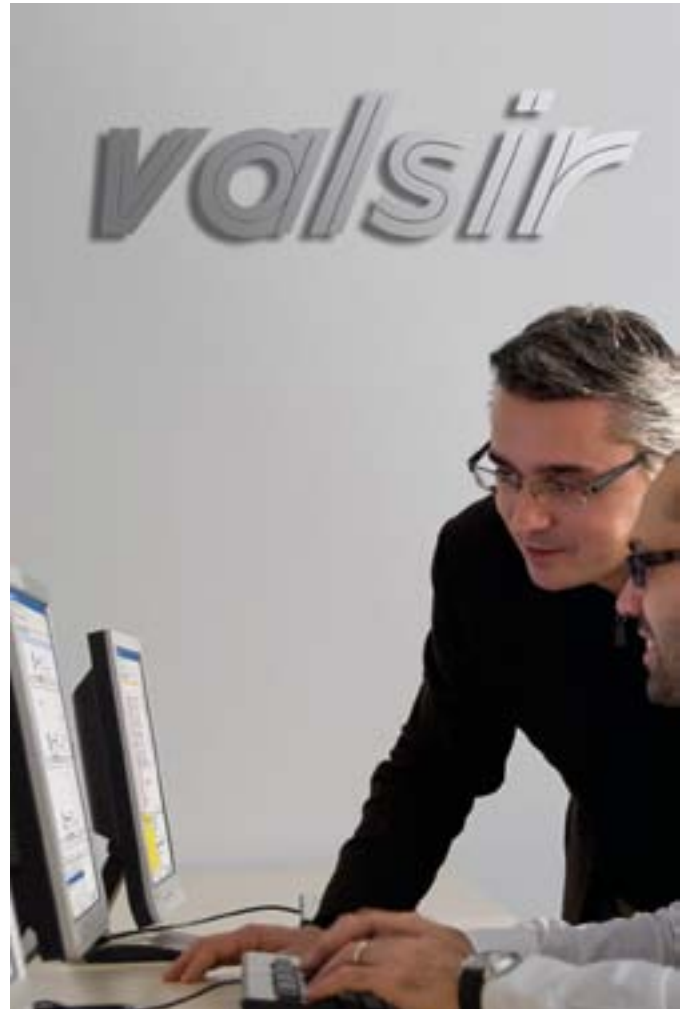
Residential estate - Nanjing (China)



TECHNICAL SUPPORT AND ASSISTANCE

Valsir provides complete support both during the planning phase and on site, thanks to a first-class technical office made up of a team of highly experienced engineers, capable of dealing with the most complex system requirements.

Valsir also boasts an important training centre called **Valsir Academy** catering for clients, distributors, plumbers and planners. Two highly equipped halls are available where theoretical and practical courses are organized on the use and design of water supply systems using the Silvestro software, a program that was developed specifically within Valsir.

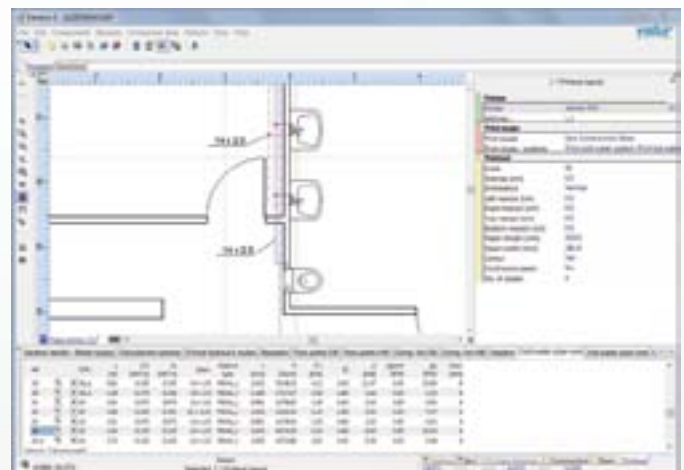
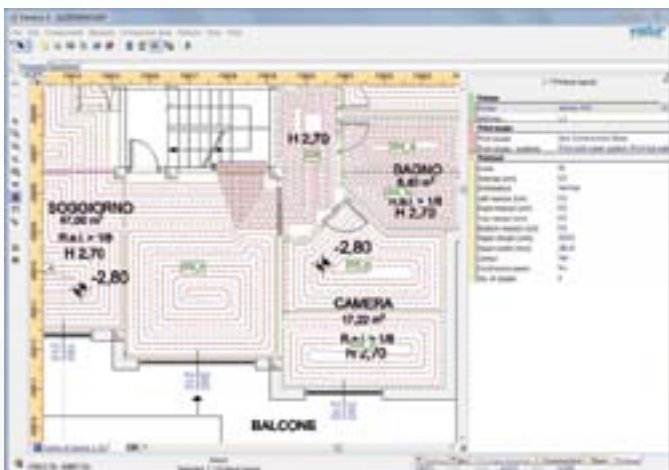


SILVESTRO SOFTWARE

The design of floor and radiator heating systems, water supply as well as waste and drainage systems, is extremely easy and the production of the project technical documents is extremely rapid when using the Silvestro software program.

Fast, simple, unique, Silvestro possesses numerous strong points:

- rapid learning curve thanks to a simple and intuitive interface;
- completely graphic background that facilitates input of the project details;
- automatic drawing of the loops in the floor radiant systems;
- automatic repositioning of the stack points on the plan view;
- generation of calculation reports that are exportable in an .xls format;
- import and export of files in .dwg format;
- immediate update of software with a guided procedure;
- creation of complete bill of materials from the project files.



QUALITY AND ENVIRONMENT



Efficient processes and reliable products are not the only parameters used to evaluate a company's conduct: today, in fact, the capacity of the company and its management team **to design and implement production processes that are sustainable from an environmental point of view** are of equal importance.

Valsir has always been committed to the manufacture of **recyclable products** and the implementation of **sustainable processes**, in line with the most advanced **Green Building** principles (green building and environmentally friendly project design), and today boasts highly sustainable production plants which, thanks to the use of renewable energy and planning that aim at the conservation of resources, have obtained a **Class A energy certificate**.

The consistency of Valsir's commitment is demonstrated by its **product approvals** which amount to **150** in total, obtained around the world from the most severe certification bodies (figure updated on 31/10/2013), and by the **certified quality system** in compliance with the European Standard **UNI EN ISO 9001:2008**.



Production processes and management systems that are verified, monitored and certified.



Sustainable production plants and processes, use of renewable energies, sustainability of resources.



Products that are verified, monitored and certified by recognized certification bodies.



Recyclable products and production processes with a low environmental impact.

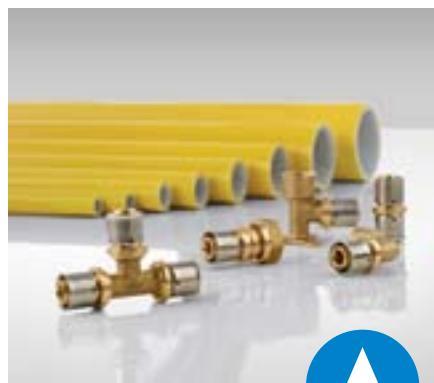
THE VALSIR RANGE



WASTE SYSTEMS



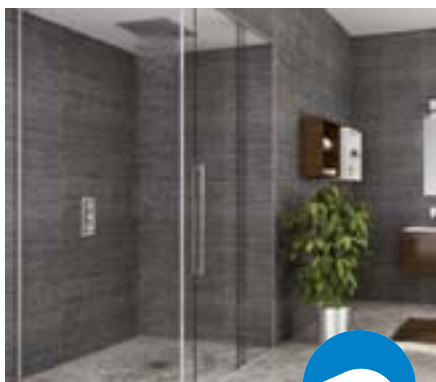
SUPPLY SYSTEMS



GAS SYSTEMS



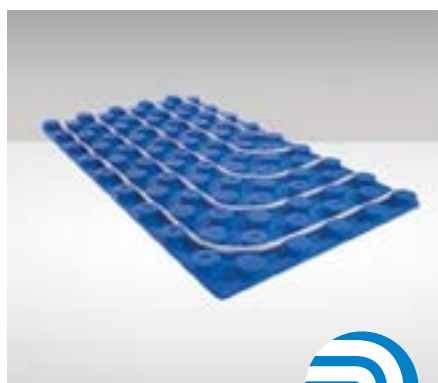
FLUSHING SYSTEMS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



ACADEMY



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