



RADIANT SYSTEMS

**Underfloor heating
and cooling systems**

MADE IN ITALY



valsir®
QUALITY FOR PLUMBING



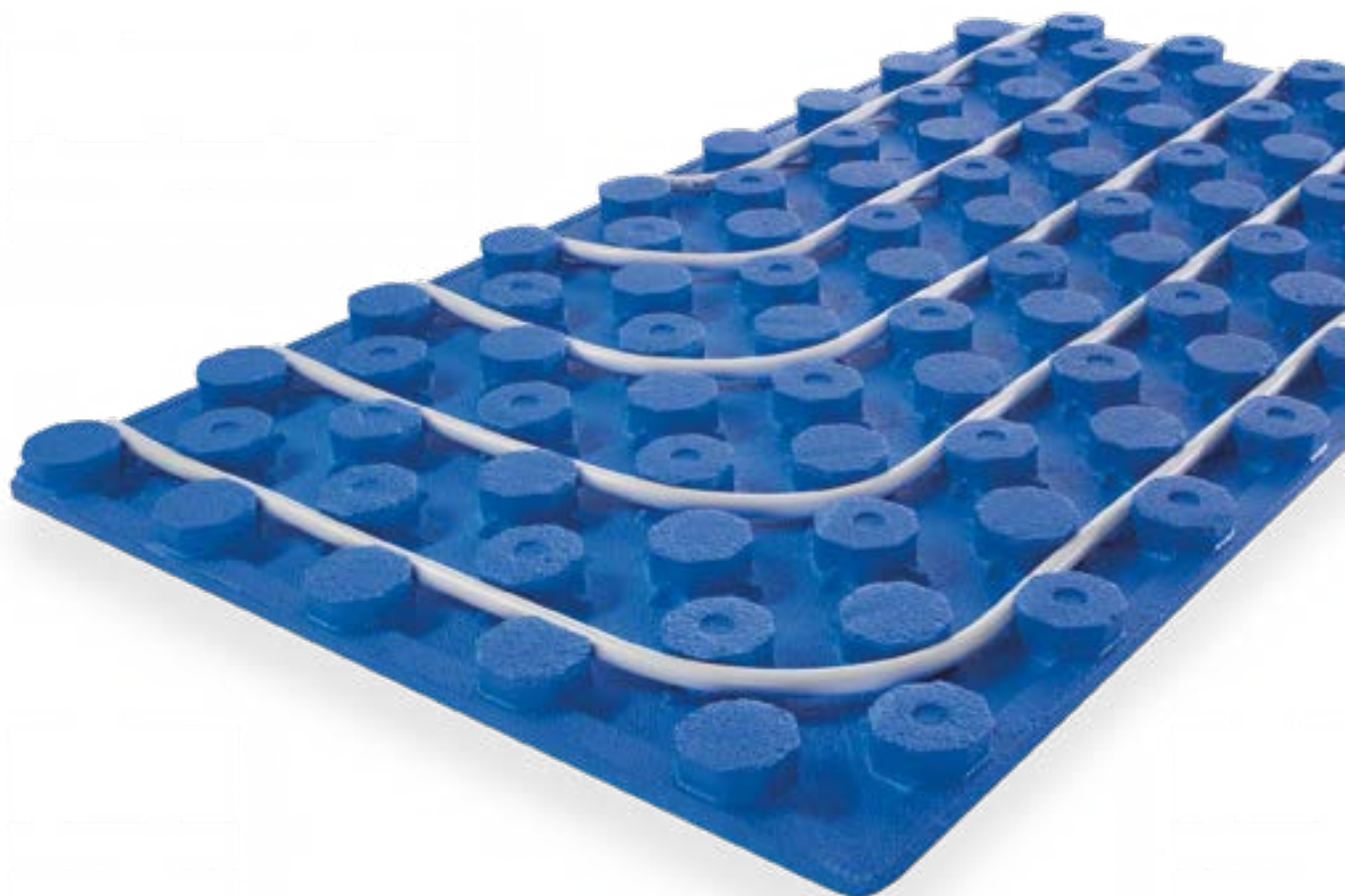
Quinn Sukhumvit 101 - Bangkok (Thailand)

What is underfloor heating and cooling system?

The floor radiant heating and cooling system is a mechanical system where the pipes carrying the heated water embedded in the floor screed.

Valsir has developed, based on years of experience, various installation packages covering all possible system requirements and building scenarios within modern civil and industrial buildings. Moreover, Valsir system is also applicable for external use, such as ice and snow melting.

The use of low-temperature heated water, combined with reduced temperature stratification, guarantees significantly higher energy savings in both heating and cooling compared to traditional systems.



The components of Valsir radiant systems are manufactured according to the highest quality standards, and in respect of the product and design standards for radiant systems.

MADE IN ITALY



CHARACTERISTICS OF THE RADIANT SYSTEM

Advantages

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

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



Lower heat loss and higher energy saving compared to conventional system.



More uniform room temperatures, resulting in greater **thermal comfort**.



Greater **reliability and flexibility** for all types of building and construction requirements.



Greater heat proliferation capacity.



No architectural limits.



Optimal air quality, eliminating respiratory disturbances.



No dust deposits.



Elimination of both mildew buildup to walls and as well as deterioration of wooden floors or window frames.



Lower CO₂ emissions to safeguard the environment and easily adaptable to **renewable thermal energy production systems**.



Easy to combine with modern heat generation systems.





Mulberry Grove Clubhouse - Bangkok (Thailand)

COMFORT AND MAXIMUM PERFORMANCE

The system

Underfloor radiant systems are heating and cooling solutions combining comfort, wellness, efficiency and sustainability.

Aesthetical advantages

There are no architectural limits linked to the presence of radiators/fan heaters, and therefore the occupance **will have total interior design freedom**. Wall mildew is eliminated as is deterioration of wooden floors, window frames and plastered walls.

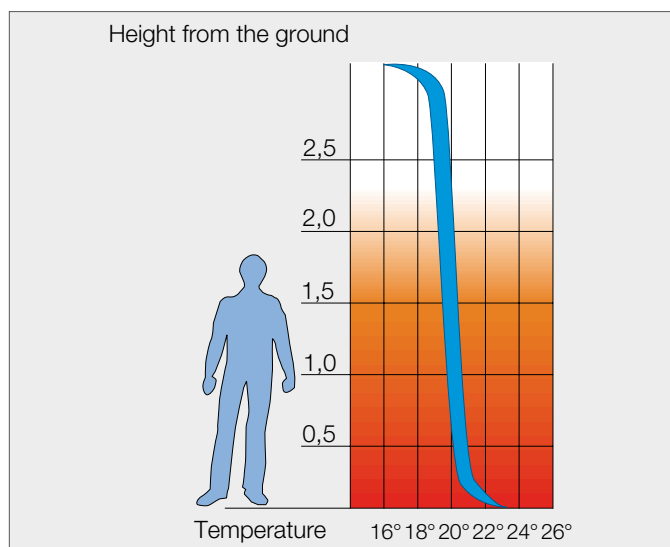
Underfloor heating systems allow the owner to make use of all available space; it is also valuable in the case of buildings of architectural and artistic importance where it is fundamental that the surroundings remain the same.

Thermal well-being

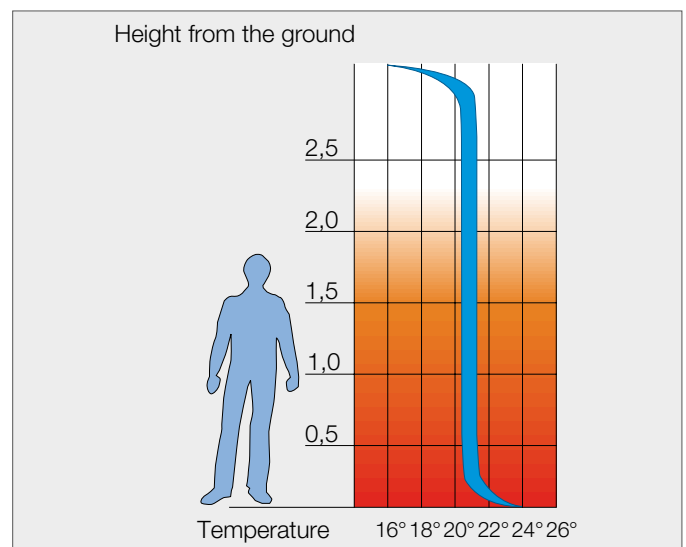
“Thermal well-being”, which is, the sensation of comfort, created within a room, is present when the temperature takes on a particular distribution in relation to the height of the room. Such temperature distribution is defined as the ideal curve of thermal well-being.

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 emitting the heat transfer by radiation **generates temperature room high levels, which is the closest to the ideal curve.**



Ideal temperature profile



Temperature profile with floor heating



A MODERN ENVIRONMENTALLY FRIENDLY SYSTEM

Output

The thermal comfort that is generated with floor heating systems allows much **lower heat losses than 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 (room height levels) the heat recovery.

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

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 are never used.

Sustainability

This is a modern low-environmental impact system compared to a traditional heating system. Low-temperature radiant systems are also fully compatible with green solutions, where the heat generator is combined with systems which produce energy from renewable sources, such as solar heating or photovoltaic solutions.

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 where performance increases as the temperature required decreases, such as heat pumps, condensation boilers, solar panels, heat recovery systems, zone heating systems.

Hygienic conditions

Floor heating systems do not favour the formation of damp areas on the floor and therefore dust, mites, bacteria or mildew will not proliferate.

Moreover, **floor heating operates at low temperatures and does not alter the relative humidity of the air**, maintaining the best conditions for personal health.

THE IDEAL PIPE FOR RADIANT SYSTEMS

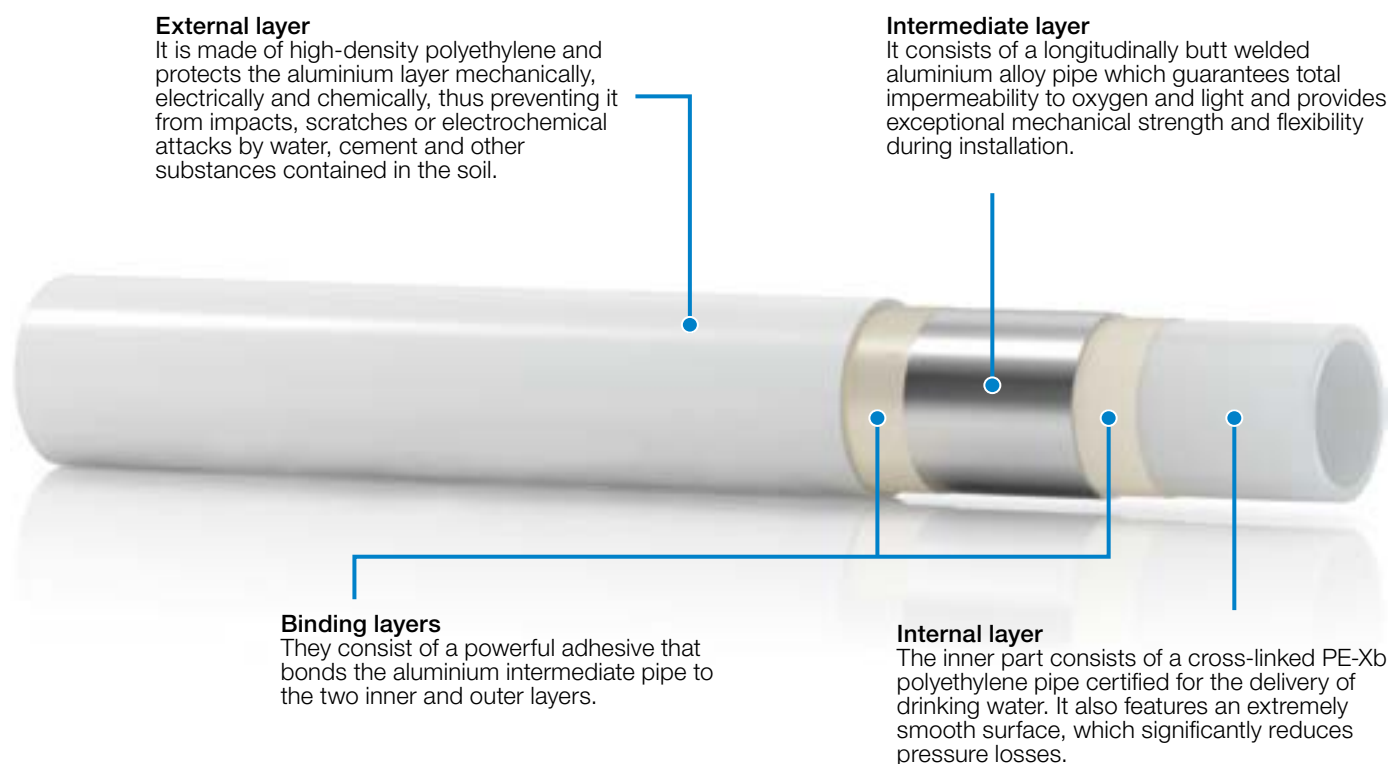
Heat performance

The Mixal® multi-layer pipe is the heart of the underfloor heating and cooling system. The aluminium layer, its thickness and its positioning ensure excellent thermal conductive qualities, which improve the efficiency of the system and make installation easier.

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

In fact the greater conductivity generates a higher temperature 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 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.



Mechanical behaviour

The mechanical characteristics of the 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; therefore the use of anchor **clips is not required** as with all-plastic pipes.

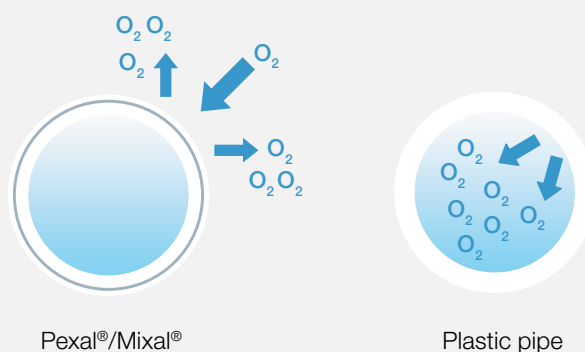
Barrier against oxygen and UV rays

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 PE-X pipes sold today are manufactured with the oxygen barrier on the external layer of the pipe. This layer is therefore 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% UR
Aluminium	0
EVOX barrier	0.21
PE-X	12,000



DEHUMIDIFICATION: PERFECT INTEGRATION WITH THE HRV SYSTEM

Cooling and dehumidification

Underfloor radiant cooling works on the sensible part of the energy contained in the air, but not on the latent heat consisting of vapour contained in the air in the form of humidity.

Depending on the relative humidity of the air, it may be necessary to dehumidify rooms to prevent condensation on the floor.

This function can be performed by V-DRYAIR EVO isothermal dehumidifiers, which are available for both wall and ceiling installation.

These machines, equipped with cooling unit, refrigeration circuit and air filters, suck in and dehumidify the air, which is then released into the room at a neutral temperature, ensuring maximum levels of comfort.

Air quality affects the state of the environment, human health and consequently the overall well-being.

Today, energy efficiency regulations have led to more buildings being insulated, thus reducing energy consumption, and preventing natural air flow.

Therefore, the need for a controlled mechanical ventilation system, by providing constant and controlled air exchange, monitors and dilutes indoor pollutants such as humidity, CO₂, Radon, VOCs (volatile organic compounds) and formaldehyde.



VALSIR DEHUMIDIFICATION MACHINES

Valsir offers several machines that not only provide outside-inside air exchange, but also dehumidification.

						
		Installation	Air flow rate in dehumidification mode	Room surface (h = 2.70 m)	HRV management	Water supply
V-DRYAIR EVO V 		Vertical	260 m³/h	100 m²	-	15-20°C
V-DRYAIR EVO H 		Horizontal	260 m³/h 520 m³/h	100 m² 200 m²	-	15-20°C
IDRONICA 		Horizontal and vertical	260 m³/h 520 m³/h	100 m² 200 m²	•	7-10°C
MAXIMA 		Horizontal and vertical	260 m³/h 520 m³/h	100 m² 200 m²	•	15-20°C

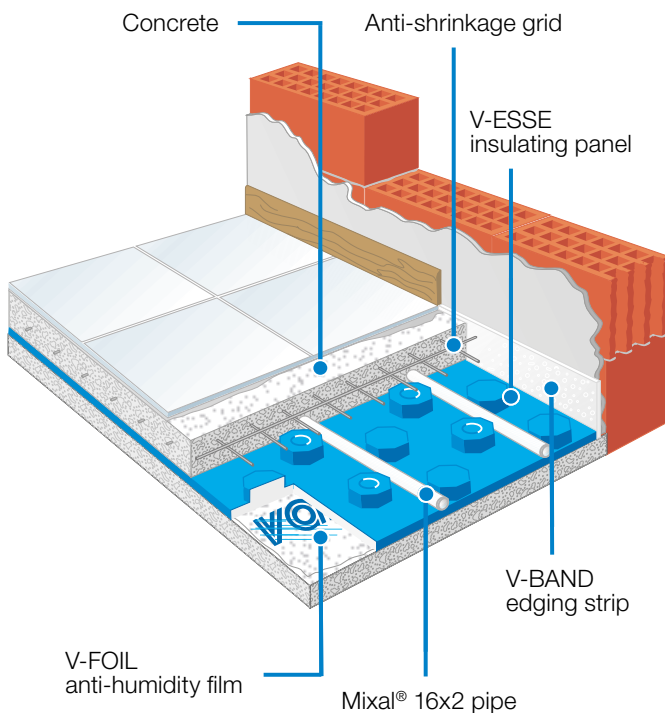


V-ESSE SYSTEM

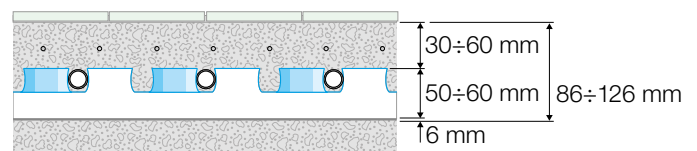
The heating and cooling system designed specifically for residential buildings and offices where the laying height is at least 90 mm.

By using the V-Acoustic multi-layer soundproof floor covering over screed of 100 kg/m², the noise performance will improve by 28 dB.

Noise reduction to impact sounds.
(UNI EN 12354-2)
 $\Delta LW > 28 \text{ dB}$



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
Compressive strength	kPa	150
Flexural strength	kPa	250
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.034
Thermal resistivity	m ² K/W	0.59 - 0.88

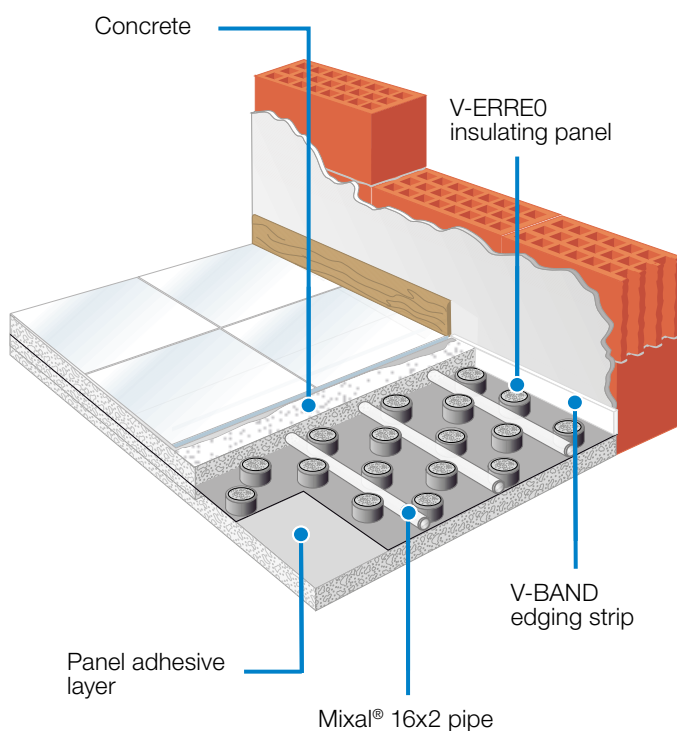


V-ERRE0 SYSTEM

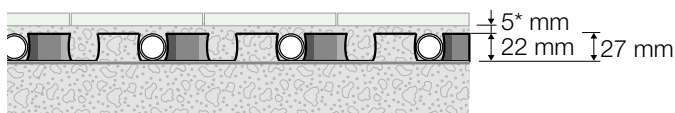
Heating and cooling system with high-resistance polystyrene preformed panel with excellent mechanical properties - ideal for renovation - providing a total thickness of 22 mm, where a 16 or 17 mm pipe can be laid.

The V-ERRE0 panel is the perfect solution for low thermal inertia systems.

In the case of installation with V-FOIL or non-grounded elements, using an additional bonding primer is recommended.



Panel characteristics	Measurement unit	V-ERRE0
Resistance	kPa	Class 200
Surface type	-	Pre-formed and perforated
Panel working dimensions	mmxmm	1400x800
Minimum pipe spacing	mm	50
Panel strength	mm	22
Flexural strength	kPa	250
Fire resistance	-	Euroclass F



* in accordance with the minimum thickness values required by the manufacturer of the self-levelling compound

V-ERRE SYSTEM

Heating and cooling system based on polystyrene panels, designed specifically to adapt to buildings with limited laying space without giving up the advantages of a radiant floor system. In case of traditional screeds, laying space is only 72 mm and can be further reduced by using self-levelling screeds certified for such applications.

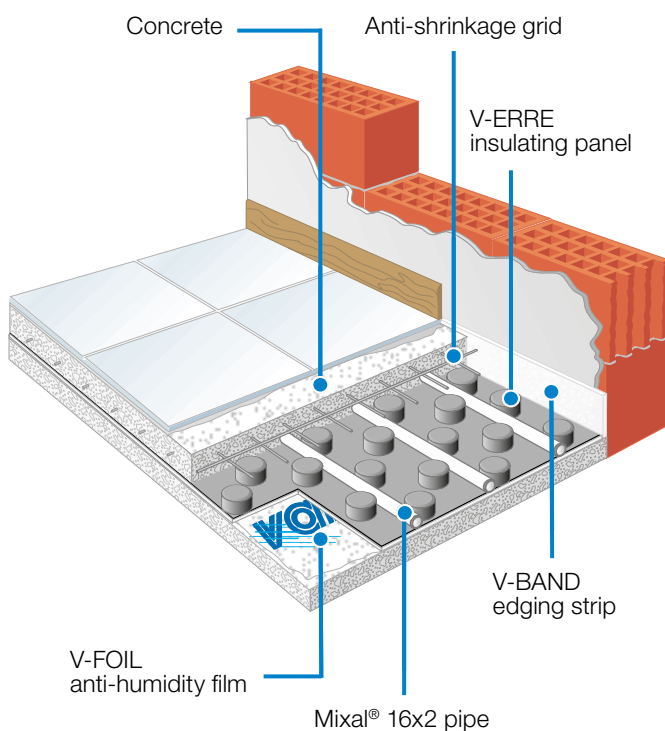
In fact, coupling a rigid moulded sheet with a moulded polystyrene slab allows considering reduction of space.

By using the V-Acoustic multi-layer soundproof floor covering over screed of 100 kg/m², the noise performance will improve by 28 dB.

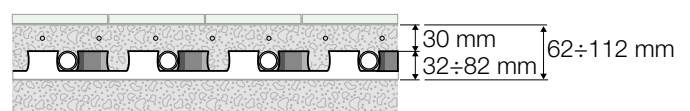
Noise reduction to impact sounds.

(UNI EN 12354-2)

$\Delta L_w > 28$ dB



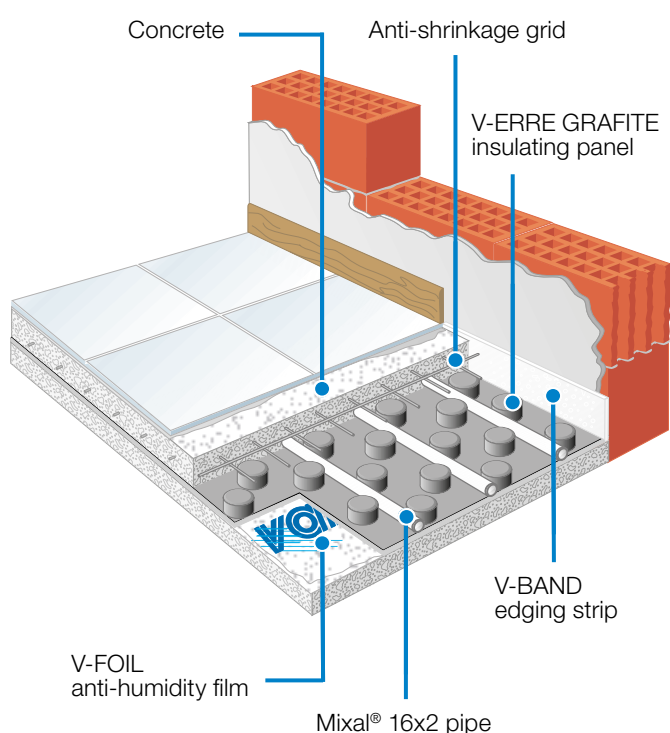
Panel characteristics	Measurement unit	V-ERRE
Resistance	-	Class 200 - 150
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1400x800
Minimum pipe spacing	mm	50
Insulation thickness	mm	10 - 20 - 30 - 40 - 50 - 60
Total thickness	mm	32 - 42 - 52 - 62 - 72 - 82
Compressive strength	kPa	200 - 150
Flexural strength	kPa	250 - 200
Fire resistance	-	Euroclass F
Fire resistance EPS	-	Euroclass E
Thermal conductivity	W/mK	0.033
Thermal resistivity	m ² K/W	0.30 - 0.61 - 0.91 - 1.21 - 1.52 - 1.82



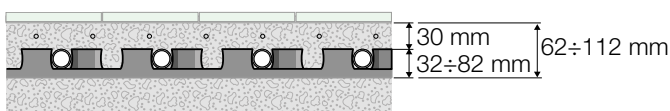
V-ERRE GRAFITE SYSTEM

Underfloor heating and cooling system made of EPS insulation layer consisting of high-strength PS thermoformed sheet with graphite additive, ranges of thicknesses from 10 to 60 mm.

The V-ERRE GRAFITE panel is the ideal solution for all building projects where energy saving is an essential requirement, available in thicknesses defined in accordance with the reference standard for sizing and installation of radiant systems (UNI EN 1264) guaranteeing compliance with design thermal resistance and optimised overall thicknesses.



Panel characteristics	Measurement unit	V-ERRE GRAFITE
Resistance	-	Class 200 - 150
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1400x800
Insulation thickness	mm	10 - 23 - 45 - 60
Total thickness	mm	32 - 45 - 67 - 82
Compressive strength	kPa	200 - 150
Flexural strength	kPa	250 - 200
Fire resistance	-	Euroclass F
Fire resistance EPS	-	Euroclass E
Thermal conductivity	W/mK	0.030
Thermal resistivity	m ² K/W	0.33 - 0.76 1.50 - 2

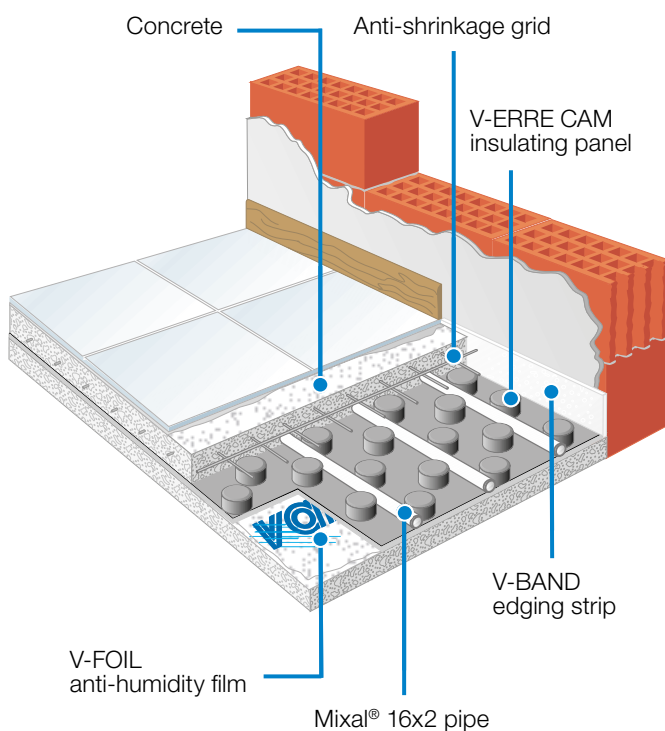


V-ERRE CAM SYSTEM

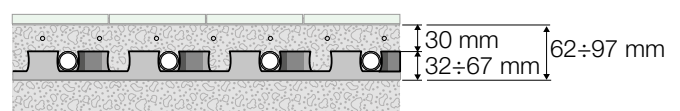
Underfloor heating and cooling system with EPS insulation panel coupled with high-strength PS thermoformed sheet in thicknesses ranging from 10 to 45 mm.

In addition to being manufactured in accordance with the UNI EN ISO 13163 standard and marked in accordance with the European EC Directives, the panel also complies with the Minimum Environmental Criteria Decree of 6/8/2023 concerning "Thermal and acoustic insulation" products.

The V-ERRE CAM panel is therefore the ideal solution for all public facilities where compliance with the minimum environmental criteria is imposed by current legislation or where verification is required to access any incentives/tax deductions.



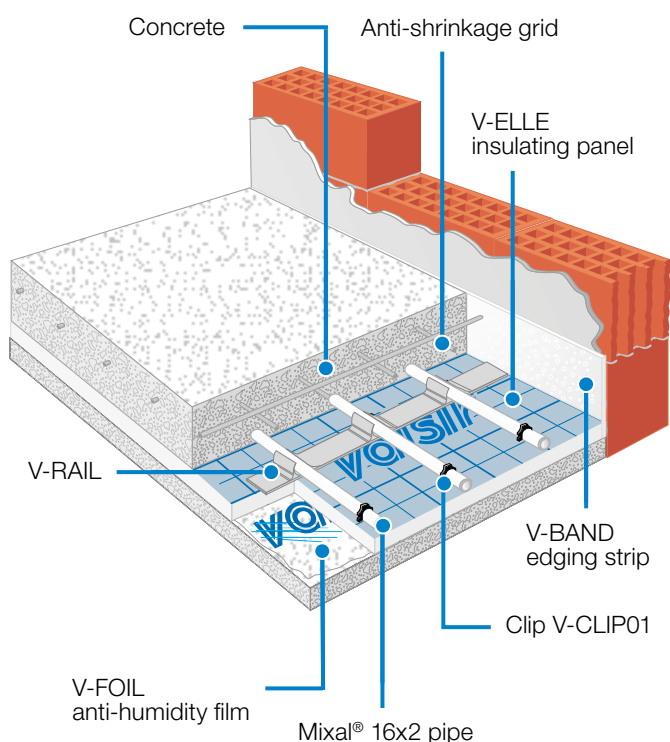
Panel characteristics	Measurement unit	V-ERRE CAM
Resistance	-	Class 200 - 150
Surface type	-	Pre-formed
Panel working dimensions	mmxmm	1400x800
Insulation thickness	mm	10 - 23 - 45
Total thickness	mm	32 - 45 - 67
Compressive strength	kPa	200 - 150
Flexural strength	kPa	250 - 200
Fire resistance	-	Euroclass F
Fire resistance EPS	-	Euroclass E
Thermal conductivity	W/mK	0.030
Thermal resistivity	m ² K/W	0.33 - 0.76 - 1.50



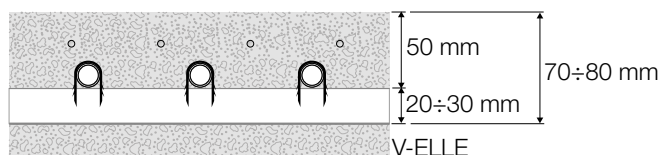
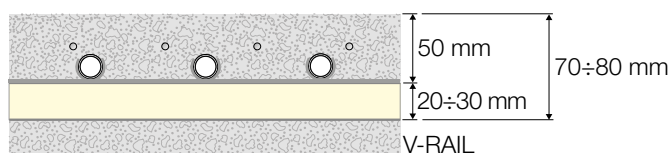
V-ELLE AND V-RAIL SYSTEM

Heating and cooling systems with a smooth panel for industrial, commercial or open-space environments where high resistance to heavy loads such as vehicles or industrial machinery is required. System installation is rapid thanks to the smooth panel, which is fastened to the Valsir multi-layer pipe by means of hooked clips or special V-RAIL fixing bars made of plastic material and equipped with double-sided adhesive.

This solution is also widely used to melt ice and/or snow in outdoor areas such as yards, ramps, heliports, car parks, but also football or rugby fields (where the insulation layer is removed).



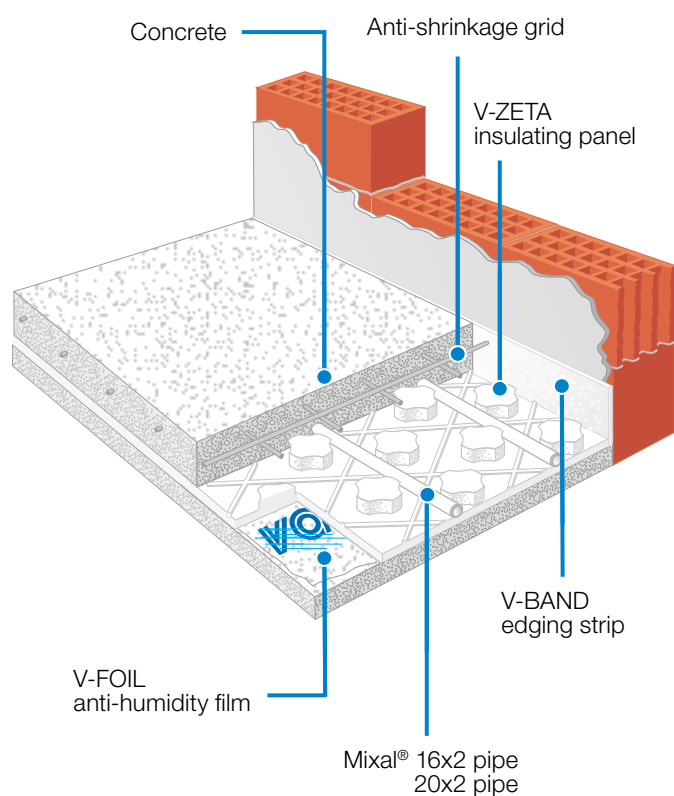
Panel characteristics	Measurement unit	V-ELLE e V-RAIL
Resistance	-	Class 200
Surface type	-	Smooth
Panel working dimensions	mmxmm	1000x12 - 1000x8
Total thickness	mm	20 - 30
Compressive strength	kPa	200
Flexural strength	kPa	250
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.033
Thermal resistivity	m ² K/W	0.61 - 0.91



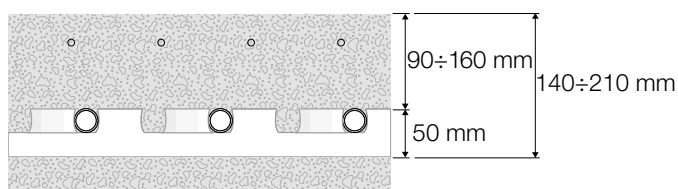
V-ZETA SYSTEM

Heating and cooling system with panel ideal for the installation of underfloor heating systems in industrial environments without compromising on the ease of installation of Valsir multilayer pipes on shaped panels.

An economically viable solution that is also suitable for residential and office environments.



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
Compressive strength	kPa	200
Flexural strength	kPa	250
Fire resistance	-	Euroclass E
Thermal conductivity	W/mK	0.035
Thermal resistivity	m ² K/W	0.57



THE IMPORTANCE OF SETTING

Hydraulic adjustment

The regulation of the heating system is a very important aspect to ensure the best living comfort. It's important that every system is "balanced" both from the point of view of the flow rates and temperatures.

Valsir's offer also includes all the necessary elements to realise and manage the central heating unit, upstream of the radiant system. After the hydraulic separator, the installation sequence provides for the manifold - using a compact connection kit - followed by modules to deliver water at the correct temperature and flow rate.



Room adjustment

From the user's perspective, adjusting the system involves setting two simple parameters: temperature and humidity.

In addition to the traditional chronothermostats and humidistats, Valsir's range includes the new Wi-Clima Evo. A single object that provides the functions of winter and summer chronothermostat, humidistat and HRV system control if required.

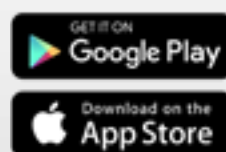
The device meets the need of latest generation residential buildings which easily control various parameters, without changing the building system operating parameters.

Wi-Clima Evo makes it possible to operate the heating or dehumidification system through electrical wiring, and/or radio frequency controls.

The Wi-Clima app, downloadable from the app store, is ideal for users wishing to control the system remotely by connecting their smartphone directly to the Wi-Clima Evo thermostat.



Download Wi-Clima app:



THE COMPONENTS

The Valsir range is simple but complete, and provides a quality solution for any type of installation.

All components are available for the professional realisation of a radiant system. In addition to multi-layer pipes, PE-X (Thermoline®) pipes can be used. Both steel and PA-M manifolds are available. Together with the panels, all the components for pipe fixing are supplied. The additive for the screed, anti-humidity foils, and other components for a smooth, safe and high performing installation are also available.

The manifold is used to connect and control each radiant circuit independently. Valsir manifolds are equipped with flow meters on the delivery of each circuit with adjustment memory lock, return lockshield, system vent and drain valve. They are available in PA-M and steel, and are supplied pre-assembled and ready for installation. The first type is modular and suitable for installation when radiant cooling is required. The second type, which can also be used for high temperature systems, allows installation in a compact space.

Several accessories can be combined with the distribution manifold: shut-off valves, fixed and variable point mixing kits, thermoelectric heads for system adjustment.



PA-M modular manifold.



Pre-assembled steel distribution manifold.



Shut-off valves.



Head and control unit.

RADIANT SYSTEMS FOR INDUSTRIAL USE

Underfloor heating is also the optimal solution for industrial and/or commercial buildings with large floor areas and high ceilings.

The first advantage is that it reduces energy consumption: it reduces air temperature stratification and heat does not accumulate in the upper part of the building. This means that areas that are not occupied by people are not heated and energy loss to the outside is reduced because, with the same level of insulation, the temperature difference between the inside and outside is reduced.

Furthermore, both energy dispersion and thermal loads are reduced, making it possible to use smaller heat generators and thus reducing the initial investment cost.

The low temperature of the heat transfer fluid makes it suitable for any heat recovery systems (if available) from production and is the only high-performance solution in the case of heat pump installation to avoid connection to the methane distribution network.

The Valsir catalogue is complete with all components to meet any type of installation.

Starting with the sintered expanded polystyrene panel with a compression resistance class of 500 kPa, 1"1/2 collector available in two versions with 1" or 3/4" connections: one for 25x2.3 mm Thermoline® PERT piping and one for 20x2 mm Thermoline® piping.



V-EFFE SYSTEM

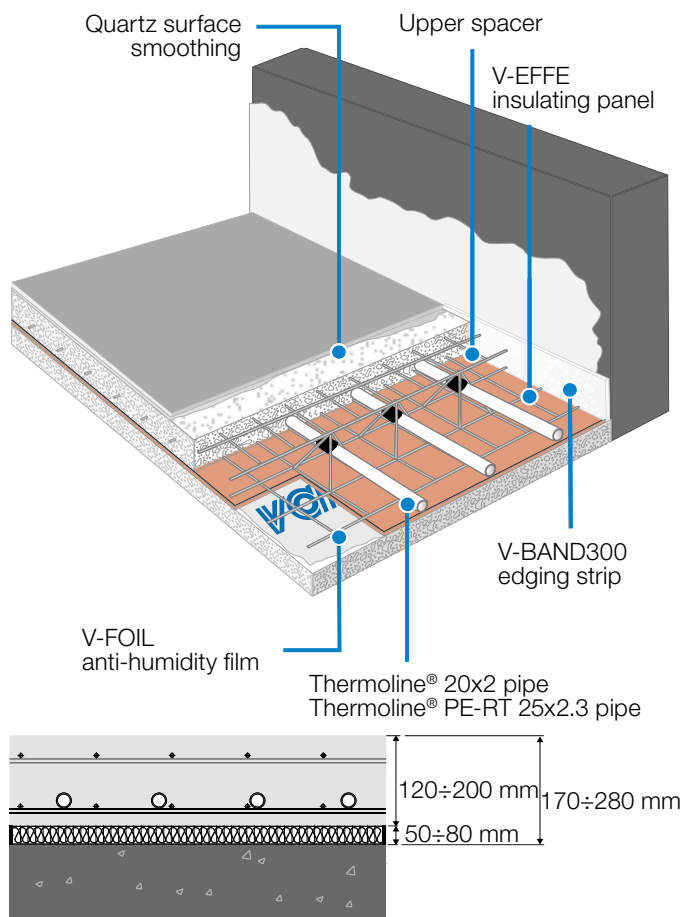
Underfloor heating system with extruded expanded polystyrene XPS insulation panel with abutting profile to improve and facilitate installation.

The panel is manufactured in accordance with UNI EN 13164 and marked in accordance with European EC Directives. It is particularly suitable for installations inside industrial buildings due to its compressive strength of up to 500 kPa.

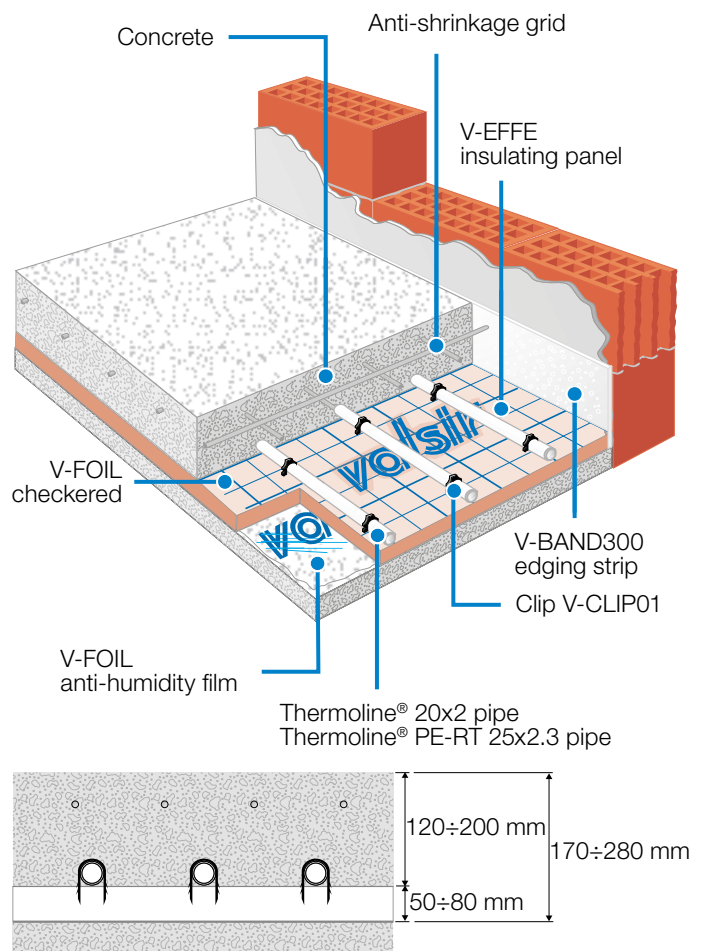
The V-EFFE panel is therefore the ideal solution for all new builds or renovations of industrial buildings where it is necessary to install a flexible, energy-efficient system without sacrificing functional characteristics.

Panel characteristics	Measurement unit	V-EFFE
Resistance	-	Class 500
Surface type	-	Smooth with abutting profile
Panel working dimensions	mmxmm	1250x600
Insulation thickness	mm	50 - 80
Compressive strength	kPa	500
Transition resistance	kPa	200
Fire resistance EPS	-	Euroclass E
Thermal conductivity	W/mK	0.033
Thermal resistivity	m ² K/W	1.52 - 2.42

Stratigraphy with reinforced screed



Stratigraphy with fibre-reinforced concrete





Coronation Square - London (United Kingdom)

REFERENCES



Valsir warehouse - Verolanuova (Italy)



Tesla Showroom - Prague Kunratice (Czech Republic)



Seriate Sports Centre - Bergamo (Italy)



Ski Resort Hotel - Goderdzi (Georgia)



CUSTOMER SERVICE

Technical support

Valsir provides complete support during design and on site, thanks to a high-level technical department that consists of a team of engineers with international experience that are capable of providing solutions to all installation needs.



Valsir Academy

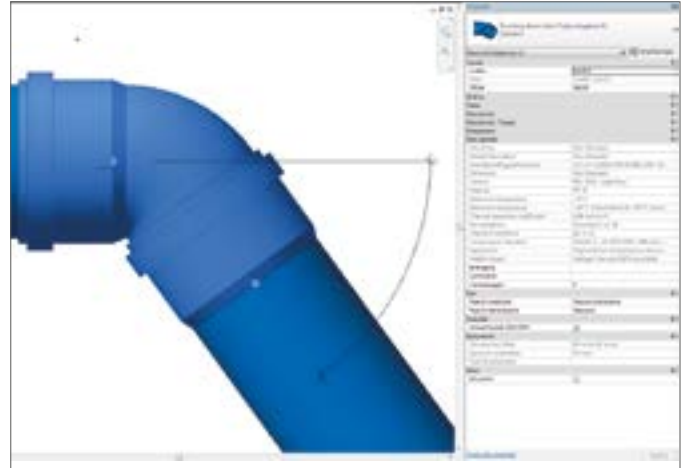
Valsir has an important training facility - **Valsir Academy** - dedicated to clients, distributors, plumbers and planners that provides perfectly equipped courses, both theoretical and practical on the use and the design of plumbing and heating systems. Courses are provided both inside the training facility and on customers' premises.

VALSIR IS BIM-READY

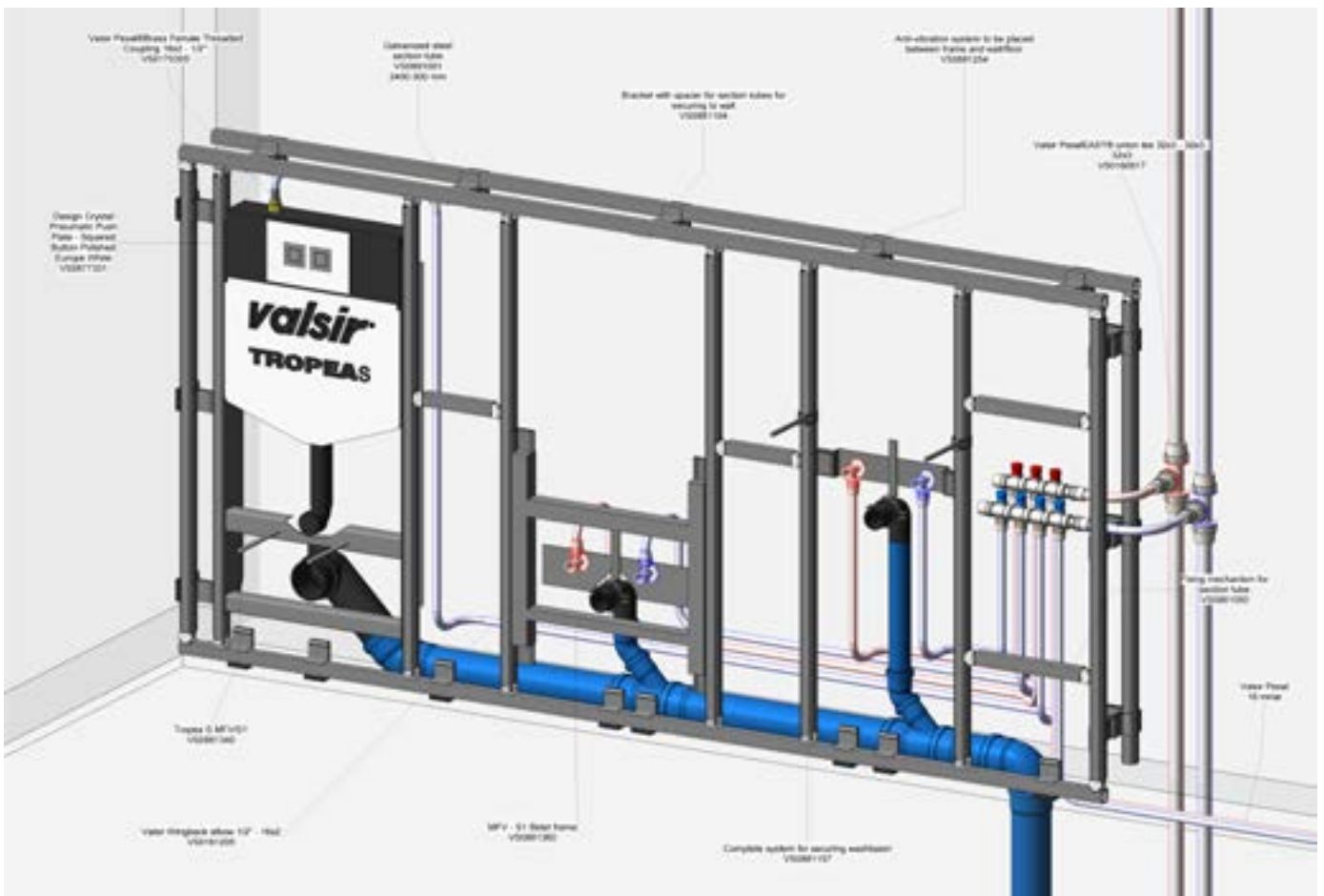
Valsir has adopted the BIM philosophy, the modelling process that allows to improve planning, design, construction and management of buildings, aligning with the industry transition to digital building modelling.

A “BIM-oriented” design offers outstanding competitive advantages: more efficiency and productivity, less errors, less downtime, less costs, greater interoperability, maximum information sharing, more timely and consistent project control.

Valsir captures the essence of this system with a set of Revit models and applications designed for quick and easy use.



www.valsir.it/u/revit



QUALITY AND ENVIRONMENT

Quality

The constant commitment of Valsir in the production of high-quality products is demonstrated by over **350 product approvals** obtained worldwide from the most stringent certification bodies (data updated to 01/09/2025), by a Quality Management System (QMS) certified in accordance with the **UNI EN ISO 9001:2015** standard, and by the Energy Management System (EMS) certified according to the **UNI EN ISO 50001:2018** standard.

Valsir S.p.A. has further demonstrated its environmental commitment by obtaining **ISO 14001:2015** certification.

Since 2019, an innovative facility has been in operation, which, integrated with the already installed photovoltaic park, produces over 30% of the electricity required for Valsir's manufacturing plants. This is a trigeneration system powered by methane gas, capable of producing electricity, steam, and cooling energy.



Sustainability

Efficient processes and reliable products are no longer the only criteria for evaluating the quality of a company's operations. Today, an equally decisive factor is the ability of the company and its management to design and implement production processes that are environmentally sustainable.

Valsir has launched a Corporate Social Responsibility (CSR) project, which includes the creation of a Sustainability Report. This report gathers information and data on the company's daily commitment in the social, economic, and environmental fields.



Download

www.valsir.it/u/sostenibilita-en



WASTE SYSTEMS



SUPPLY SYSTEMS



GAS SYSTEMS



FLUSHING SYSTEMS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



HRV SYSTEM



ACADEMY



SEWER SYSTEMS



WATER TREATMENT



valsir®
QUALITY FOR PLUMBING



MIX
Paper | Supporting
responsible forestry
FSC® C173101

L02-579/4 - Settembre 2025



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