Soundproof waste and drainage system inside the buildings
Silere®, the leading push-fit soundproof waste system

Over recent years there has been an increase in the attention given to the emission of the noise generated inside buildings, involving various aspects such as urban planning, construction techniques, the layout of rooms and the soundproofing of systems.

Respect of the conditions of acoustic well-being of homes, as well as the workplace and public venues, has become an essential requirement of buildings.

**Silere®** is a push-fit system composed of pipes, fittings and accessories, is industrialized, produced and patented by Valsir and meets these requirements guaranteeing the levels of silence of waste systems as required by the laws and regulations in force.

Silere® is produced in compliance with EN 1451 and can be used for low and high temperature waste systems, for waste network ventilation systems and for rainwater drainage systems inside the buildings, for civil and industrial use, hospitals and hotels.

The wide range of pipes, fittings and accessories allows an entire waste system to be constructed: from the branches to the sanitary appliances, the stacks and waste manifolds.
The benefits of using a Silere® waste system

- Excellent soundproofing performances measured in the Fraunhofer laboratory of Stuttgart, in compliance with EN 14366, equal to 6 dB(A) with a flow rate of 2 l/s (certificate P-BA 223/2006).
- Speed and ease of installation without the use of any special tools, thanks to the push-fit jointing method. Also the socket joint doesn’t require the extra use of harmful glues or solvents.
- Resistance to intermittent discharges at temperatures as high as 95°C.
- High impact resistance at extremely harsh temperatures as low as -20°C.
- The pipes and fittings are characterised by a large thickness and high mechanical resistance.
- High chemical resistance to the substances dissolved in civil and industrial waste systems.
- Wide range of transition fittings for connection to other waste systems such as cast iron, PE, PP, PVC.
- Wide range of diameters from DN 50 mm to DN 160 mm.
- The product, its recyclability and the production processes are based on Green Building principles which promote respect for the environment and the conservation of natural resources.

Silere® pipes and fittings are made of a patented polypropylene-based mix (PP) and mineral loads (MF) that provide high mechanical characteristics and at low (impact resistance at -20°C) and high temperatures (at a continuous operating temperature as high as 95°C).

The Silere® waste system can transport waste liquids with PH values between 2 and 12, it has a high resistance to the most common chemical agents and is characterised by an extremely smooth surface, such as to prevent the accumulation of deposits inside the waste pipework.
A RANGE THAT STANDS OUT

The range is made up of pipe lengths between 150 mm and 3 m and is characterised by a wide choice of fittings and accessories that allow the most varied system configurations to be created.

From diameters 58 mm and 78 mm for the creation of branches for each floor, to diameters 135 and 160 mm for waste manifolds. These particular pipe sizes are due to the large wall thickness and the need for a sufficient bore passage; thanks to the special connection and transition fittings, it is possible to connect the Silere® system to other waste systems made of different materials.

The range is completed with accessories for connection to other waste systems produced by Valsir and pipe clips with anti-vibration rubber to reduce the vibrations that are transferred to the installation walls when the waste system is in operation.

Fire collars

When fire protection standards or local regulations require the compartmentalization of rooms such as, for example, central heating plants, underground car parks and industrial facilities that are at risk of fire, then fire collars can be used.

To meet all system requirements and the most strict fire protection regulations a complete range is available that includes diameters from 58 to 160 mm.

It is important to remember that the Silere waste system is made of a polypropylene based material and therefore, unlike other materials such as PVC, it does not produce carcinogenic compounds such as dioxins and vinyl chloride in the event of fire.
Valsir is the only company that can provide a sound insulating waste system with Silere® “ventilation branch”. This is the ideal solution in high-rise buildings where the simultaneous use factor of the sanitary appliances is high.

This innovative waste system guarantees excellent ventilation of the waste stack and branches on each floor, limiting pressure fluctuations in the system.

This system also offers significant advantages and money savings thanks to the possibility of constructing single stacks (therefore without the need for parallel ventilation) of a 110 mm diameter with a draining capacity that is more than double that of systems with primary ventilation.

The ideal solution in high-rise buildings

- **Single soil stack**, a parallel ventilation stack is therefore not required.
- **Increase in drainage flow** in comparison with conventional systems.
- **Reduction in speed** of waste flow.
- **Excellent ventilation** of the stack and branches of each floor.
- **Up to 6* connections** on one branch fitting.
- **Up to 45** apartments can be connected to the same soil stack.

* The side connections of the Silere® ventilation branch are created in the factory according to project specifications.
** The number of apartments depends on the composition of the same.
A waste system with a Silere® “ventilation branch” allows greater volumes to be drained than any other waste system (primary ventilation systems, direct or indirect parallel ventilation systems, secondary ventilation systems).

**System with primary ventilation**

**System with parallel ventilation**

**System with ventilation branches**

Drainage capacity **40% greater** than waste systems with primary ventilation.

Drainage capacity is **120% greater** than waste systems with primary ventilation.
When a waste system is in operation, noises originate inside the pipework which vibrates due to the fall of the liquid being discharged.

Most of the noise propagates inside the pipe, however, the vibrations generated are transmitted from the walls of the pipe to the surrounding area, to the pipe anchoring system and consequently to the building structure.

To control the levels of noise created by waste systems not only requires the correct design of the system and clearly the correct installation but also the identification of a waste system that will guarantee a high soundproofing performance.

Silere® is a top sound insulating product that was designed with the aim of providing high performing sound insulated waste systems, in fact, with a waste flow of 2 l/s (represents the typical discharge rate of a WC) noise levels of 6 dB(A) were measured.

The extraordinary soundproofing performance of Silere® have also been demonstrated by laboratory tests conducted at the CSIRO Australian complying with the requirements of the Building Code of Australia.

Levels of sound pressure $L_{SC,A}$ of Silere® pipe in compliance with EN 14366

Levels of sound pressure $L_{IN}$ of Silere® pipe in compliance with DIN 4109

The measurement of the soundproofing performance of waste systems

The reference standards used to evaluate the performance of waste systems in the laboratory and which specify the measurement methods are DIN 4109 (together with DIN 52219) and EN 14366.

Both standards require the use of a test building composed of four floors with a concrete wall onto which the waste stack is anchored.

The measuring floors are divided into two rooms: the front room is where the waste stack is installed, the rear room is free of installations and receives the sound vibrations that are transferred from the partition wall.

The values measured can be expressed using different indicators according to requirements and the reference standards.

$L_{SCA}$ is the indicator required by EN 14366 and indicates the structure-borne noise level, whereas $L_{IN}$ is an indicator that also encompasses the air-borne noise required by DIN 4109.

It’s not important which indicator is the most effective, however, when comparing different waste systems it is of vital importance for a fair comparison that the same indicator is used. The real noise levels produced by a waste system can only be measured when it is in operation, in that it depends on numerous factors such as the installation and the building type; laboratory indicators should be used only as a means of comparison.
The seal is completely inaccessible thanks to the particular shape of the housing.

The joint guarantees total bore passage thanks to the absence of reductions in the section.
PUSH-FIT JOINT: RAPID AND EASY INSTALLATION

Silere® ensures practical and rapid installations without the use of glues, electrical appliances or special tools, thanks to the jointing system with push-fit socket.

The particular shape of the seal and the housing of the push-fit joint guarantee hydraulic tightness and allow the normal movements of the pipe including those caused by thermal expansion.

A system that is suitable for temperature fluctuations: the thermal expansion of Silere® is extremely low compared with the most common plastic materials: a 3 m pipe will expand in length by just 9 mm when the waste flow is at a continuous temperature of 60°C.

Thanks to Silere®’s low coefficient of heat expansion the push-fit joints are capable of absorbing the variations in length of the pipe without taking any particular precautionary measures; it is enough to observe the installation instructions in the Valsir technical manuals.

The bi-joint sleeve to reduce wastage to a minimum

To allow use of leftover pieces of pipe, Valsir supplies a bi-joint sleeve: a special fitting that allows two pipes without sockets to be connected together, guaranteeing hydraulic tightness without compromising flow rates.
Capital Gate - Abu Dhabi (United Arab Emirates)
REFERENCES

Austin Hospital - Melbourne (Australia)

Banc de Sang - Barcelona (Spain)

Dolmabahce Palace - Istanbul (Turkey)

Hotel Ceylan Continental - Istanbul (Turkey)

Mercure Hotel - Siracusa (Italy)

Reyno de Navarra Arena - Pamplona (Spain)
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, theoretical and practical courses on the use and the design of plumbing and heating systems. Courses are provided both inside the training facility and on customers’ premises.
SOFTWARE

Silvestro software

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

Valsir is BIM ready

Valsir has embraced the BIM philosophy, the modelling process that allows the improvement of planning, design, construction and the management of buildings, concurring with the transition of the industry toward the digital representation of buildings. “BIM oriented” planning offers extraordinary competitive advantages: greater efficiency and productivity, less errors, less downtime, lower costs, enhanced interoperability, maximum sharing of information, a more punctual and coherent supervision of the project. Valsir captures the essence of this system creating a series of Revit applications and models designed for simple and fast use.
Quality

The constant commitment of Valsir to the creation of quality products is demonstrated by over 170 product approvals obtained around the world from the most strict certification bodies (figure updated on 01/01/2017), and by a quality system that is certified to **UNI EN ISO 9001:2008**.

Sustainability

Efficient processes and reliable products are no longer the only parameters used to perform an assessment of the quality of a company’s conduct: the capacity of the company and its management to design and implement production process that are sustainable from an environmental point of view is of equal importance.

Valsir has started a project of Corporate Social Responsibility and has published its 1st Sustainability Report that gathers facts and figures relating to the daily commitment of Valsir in terms of social, economic and environmental responsibility.

For more information, download here the 1st Sustainability Report.

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