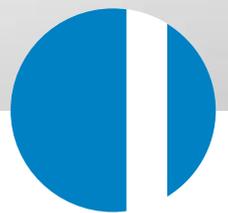


TRIPLEPLUS



**Triple layer soundproof waste
and drainage system
inside the buildings**



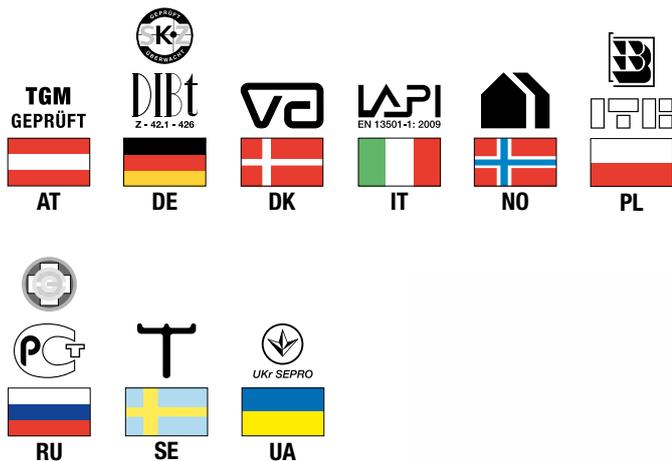
valsir[®]
QUALITY FOR PLUMBING



Media-tic - Barcelona (Spain)

TRIPLUS

Triplus[®], the evolution of push-fit waste and drainage systems



The market's increasing attention to waste and drainage systems, in particular to the correct design of systems and to their hydraulic performance, convinced Valsir to create a particularly innovative product line.

The Triplus[®] pipes are in fact made up of three layers of material, which, when joined, result in a system with extremely good mechanical characteristics, even at low temperatures, and an excellent soundproofing performance.

Triplus[®] is a push-fit system that includes triple layer pipes, fittings and accessories, industrialized, produced and patented by Valsir, that guarantees the levels of low noise emissions of waste systems required by the regulations, laws and standards in force.



Triplus[®] is manufactured in compliance with European Standard EN 1451 and can be used **for waste and drainage systems** at low and high temperatures, ventilation systems for waste and rainwater networks **inside buildings for residential and industrial use, hospitals and hotels.**

The wide range of pipes, fittings and accessories allows construction of the entire waste network, the branches of the sanitary fixtures, the stacks, waste manifolds, etc.

MADE IN ITALY



STOP

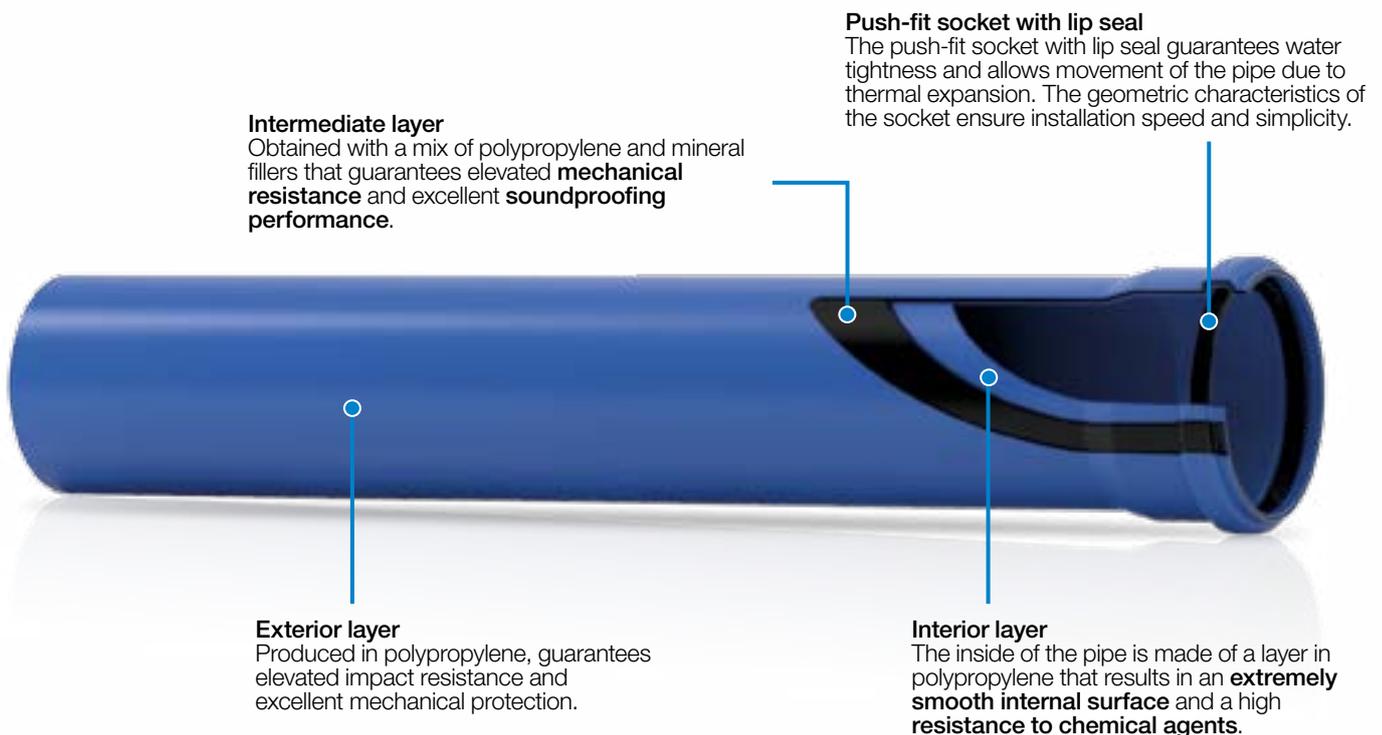
↑ EMERGENCY

- Main Entrance
- Emergency A & B
- Exit

CHARACTERISTICS OF EXCELLENCE

The advantages of using the Triplus® waste system

- **Speed and extreme ease of installation** on site without the use of special tools, thanks to the push-fit connection. The socket connection, moreover, does not require the use of glues or harmful solvents.
- Excellent soundproofing performance: measured in the Fraunhofer laboratories in Stuttgart, in compliance with European Standard EN 14366 equal to **12 dB(A) with a flow rate of 2 l/s** (certificate P-BA 227/2006).
- High impact resistance at extremely harsh temperatures (**as low as -25°C**).
- Resistance to intermittent discharges at **temperatures as high as 95°C**.
- The pipes are made up of three layers of material joined together to guarantee **elevated mechanical resistance**.
- **High chemical resistance** to substances dissolved in civil and industrial waste waters.
- Wide range of **transition fittings** for connection to other waste systems in cast iron, PE, PP, PVC.
- Wide range of **diameters from DN 32 mm to DN 250 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.



The intermediate layer is created with a **patented polypropylene-based (PP) mix with mineral fillers (MF)** such as to provide the Triplus® system with excellent mechanical characteristics at low (impact resistance at temperatures as low as -25°C) and high temperatures (continuous discharge with temperatures as high as 95°C).

The Triplus® waste system can transport waste waters with PH values between 2 and 12, it has a high resistance to the most common chemical compounds and is characterised by an extremely smooth internal surface that prevents the build-up of internal deposits inside the waste network.



Ø32 Ø40 Ø50 Ø75 Ø90 Ø110 Ø125 Ø160 Ø200 Ø250

AN EXTREMELY WIDE RANGE

The range is composed of pipe lengths between 150 mm and 3 m and is characterised by a wide choice of fittings and accessories that allows the construction of the most varied system configurations.

The smaller diameters such as 32, 40 and 50 mm are used for the branch pipe connections on each floor, while the larger diameters such as 250 mm are used for the waste manifolds.

The range is completed with accessories for the connection to other Valsir waste systems and pipe clips, which, when fitted with anti-vibration rubber, allow reduction of the vibrations that are transferred to the installation walls when the waste system is in use.



Fire-stop sleeve

When standards and local regulations require the **fire compartmentation of rooms** such as, for example, boiler rooms, underground garages or industrial fire-hazard areas, then fire-stop sleeves shall be used.

To cover all system necessities and to meet the most severe fire prevention requirements a **complete range** is available, that covers diameters **from 40 to 250 mm**.

It is important to remember that the Triplus 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 supply a triple layer waste system with a Triplus® “ventilation branch”**. This is the ideal solution in high-rise buildings with a high simultaneous use factor of the sanitary appliances.

This innovative waste system guarantees excellent ventilation of the stack and branch connections on each floor thus limiting pressure fluctuations within the system.

This system also allows significant advantages in terms of cost savings thanks to the possibility of creating one soil stack (therefore no separate ventilation pipes are required) with **one 110 mm diameter with over double the discharge capacities** of primary ventilation systems.

The ideal solution for high rise buildings

- **One soil stack**, no separate ventilation pipes required.
- **Increase in stack load** in comparison with conventional systems.
- **Reduction in speed** of effluents.
- **Excellent ventilation** of the stack and branches of each floor.
- **Up to 6* connections** on one branch fitting.
- **Up to 45** flats** on connected to the same soil stack.

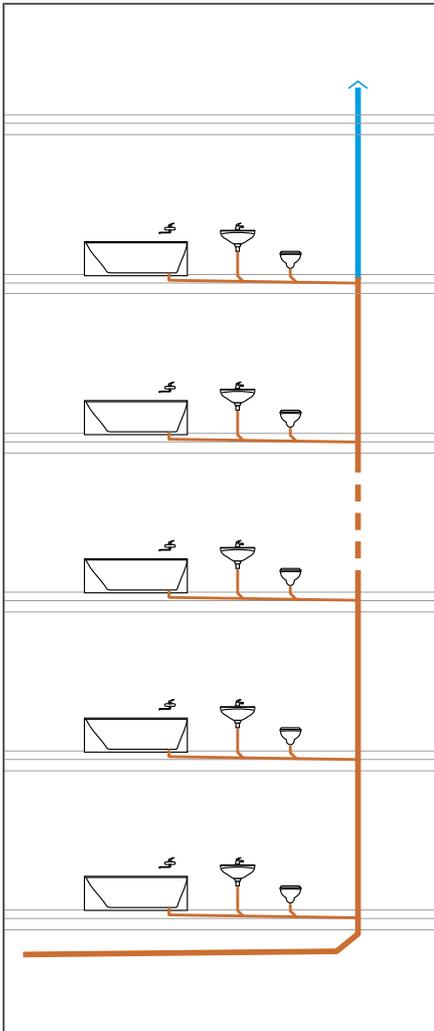
* The side connections on the Triplus® ventilation branch are made in the factory according to project specifications.

** The number of bathrooms depends on their composition.

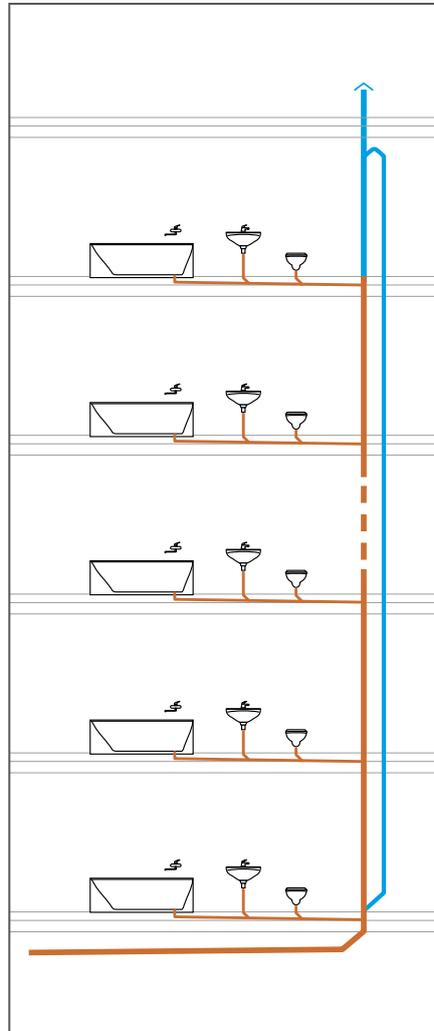


Waste systems with Triplus® “ventilation branch” allow greater stack loads than any other waste system (systems with primary ventilation, systems with direct or indirect parallel ventilation, systems with secondary ventilation).

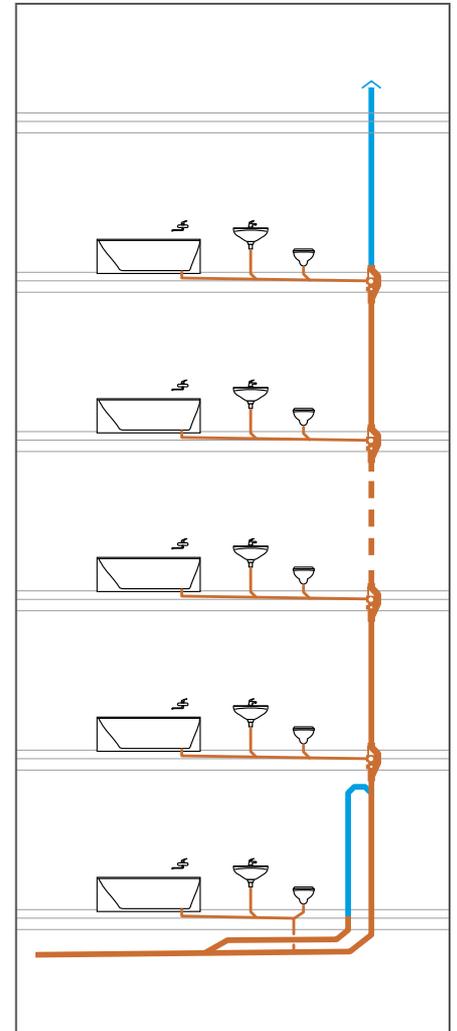
System with primary ventilation



System with parallel ventilation



System with ventilation branches



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

Drainage capacity **120% greater** than systems with primary ventilation.

SIGNIFICANT ACOUSTIC PERFORMANCE

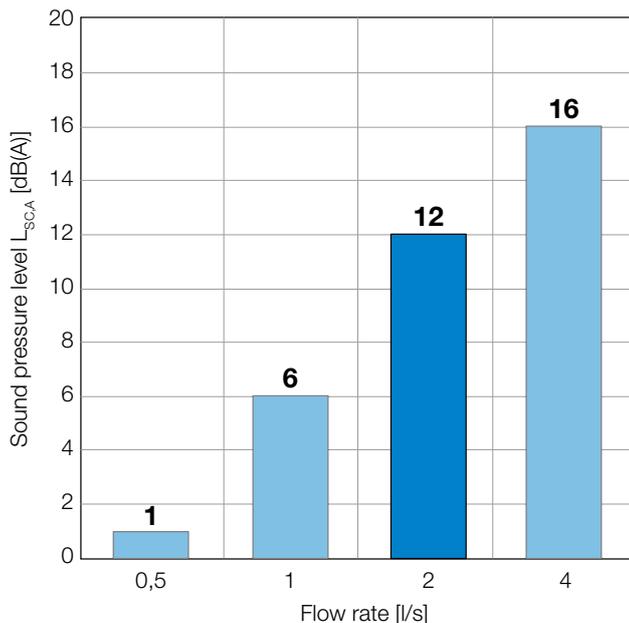
When a waste system is in use, noises are generated inside the pipelines causing it to vibrate from the fall of the liquid being discharged.

Most of the noise generated spreads inside the pipe but the vibrations that are generated are transmitted from the walls of the pipe to the surrounding area and to the bracketing systems and consequently to the building structure.

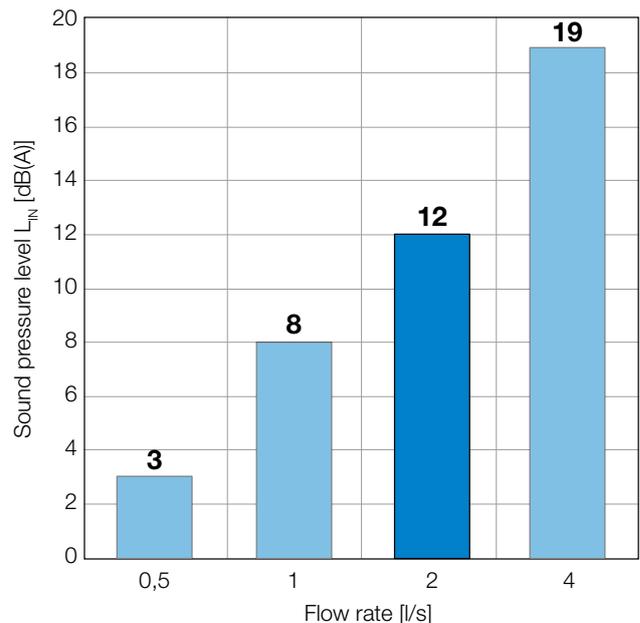
To minimize noise levels in waste and drainage systems, not only should the system be properly designed and the waste circuit be mounted correctly, but it is also important to choose a system with an elevated soundproofing performance.

Triplus® allows waste systems to be installed that guarantee excellent soundproofing performance, **with 2 l/s (typical toilet flush) noise emissions of 12 dB(A) were measured.**

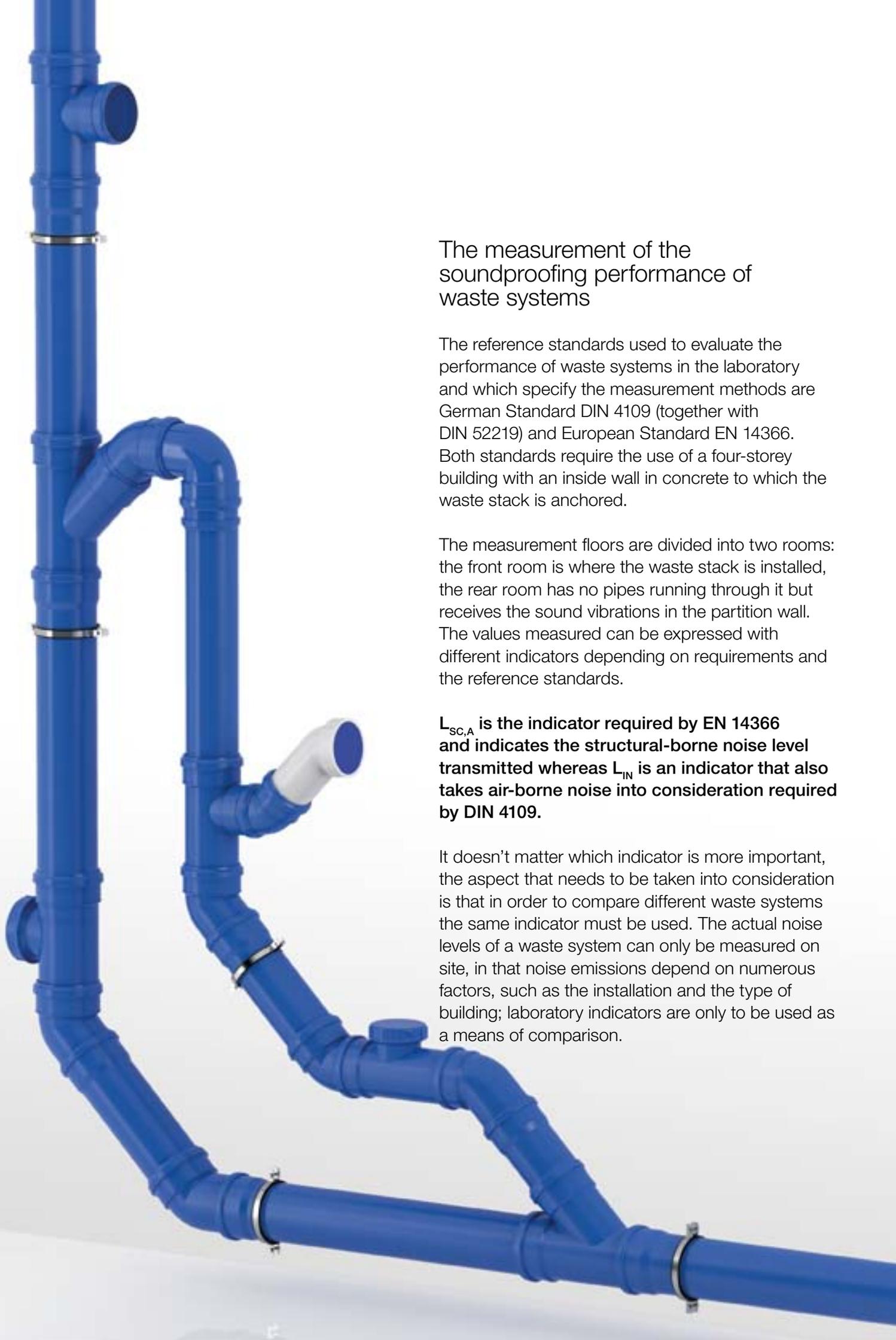
Sound pressure levels $L_{SC,A}$ of the Triplus® pipe in compliance with EN 14366



Sound pressure levels L_{IN} of the Triplus® pipe in compliance with DIN 4109



Sound pressure levels expressed in dB(A) measured on the ground floor behind the installation wall for pipe diameter 110 mm in compliance with DIN 4109 and EN 14366. These results were obtained by the Fraunhofer Institute of Stuttgart using two soundproofing pipe clips on each floor.



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 German Standard DIN 4109 (together with DIN 52219) and European Standard EN 14366. Both standards require the use of a four-storey building with an inside wall in concrete to which the waste stack is anchored.

The measurement floors are divided into two rooms: the front room is where the waste stack is installed, the rear room has no pipes running through it but receives the sound vibrations in the partition wall. The values measured can be expressed with different indicators depending on requirements and the reference standards.

$L_{SC,A}$ is the indicator required by EN 14366 and indicates the structural-borne noise level transmitted whereas L_{IN} is an indicator that also takes air-borne noise into consideration required by DIN 4109.

It doesn't matter which indicator is more important, the aspect that needs to be taken into consideration is that in order to compare different waste systems the same indicator must be used. The actual noise levels of a waste system can only be measured on site, in that noise emissions depend on numerous factors, such as the installation and the type of building; laboratory indicators are only to be used as a means of comparison.



The seal is completely inaccessible thanks to the particular structure of the housing.

The joint guarantees total bore passage thanks to the absence of reductions in the section.

PUSH-FIT JOINTS, INSTALLATION EASE AND RAPIDITY

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

The special geometry of the seal and the push-fit socket guarantee total water tightness and allow the normal movements of the pipeline including those caused by thermal expansion.



A system suited to temperature fluctuations: **thermal expansion of Triplus® is extremely low in comparison with other more common plastic materials:** a 3 m pipe expands by just 9 mm when the flow of liquid is at a continuous temperature of 60°C.

It is thanks to its low coefficient of heat expansion that the push-fit joints are capable of absorbing the variations in pipe length, without the need to take any particular measures; simply follow the installation instructions indicated in the Valsir technical handbooks.



The bi-joint sleeve to minimise waste

In order to make use of pipe cut offs that would otherwise be discarded, Valsir supplies the bi-joint sleeve. This is a special fitting that allows plain ended pipes to be connected guaranteeing water tightness without penalising waste flow rates.



Nation Towers - Abu Dhabi (United Arab Emirates)

REFERENCES



Marina Hotel F1 circuit - Abu Dhabi (United Arab Emirates)



RBA - Barcelona (Spain)



Torres Intempo - Benidorm (Spain)



Al Raha Beach Development - Abu Dhabi (United Arab Emirates)



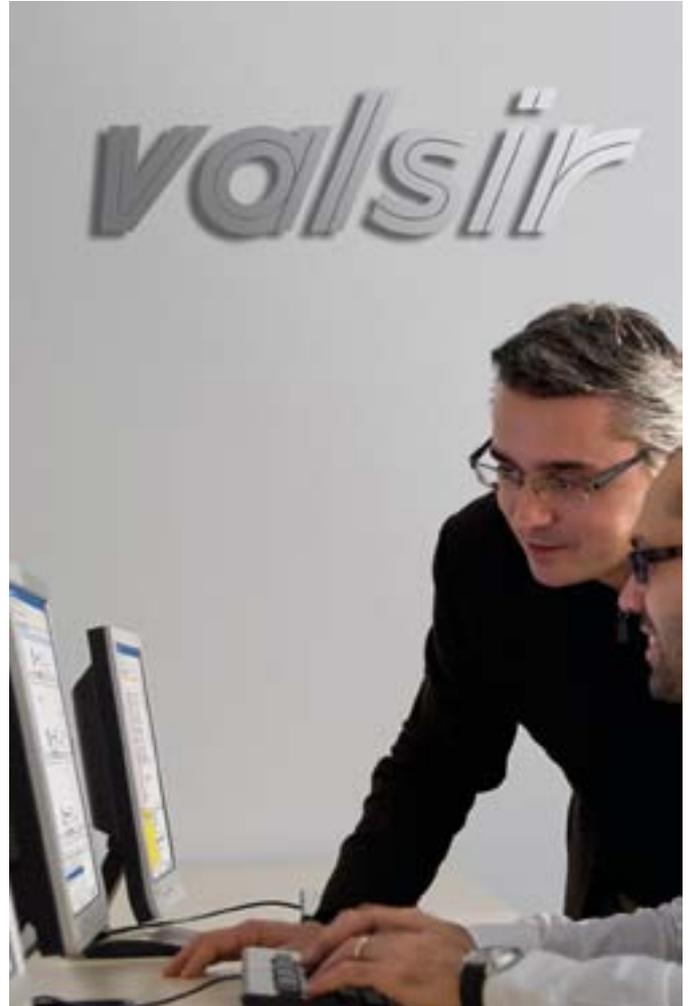
Mikrohaus Loft - Wien (Austria)



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.



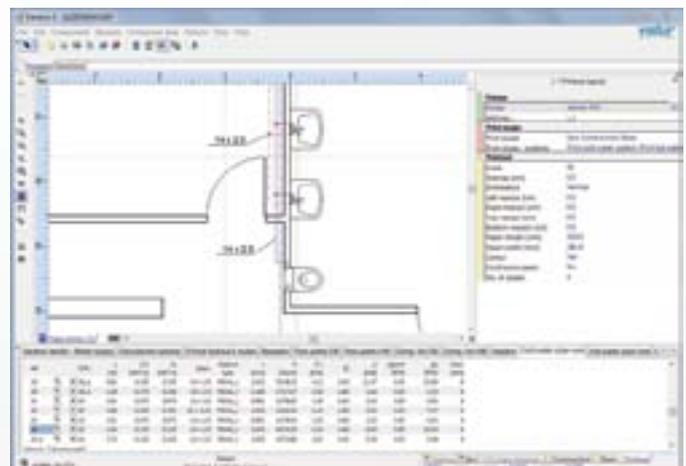
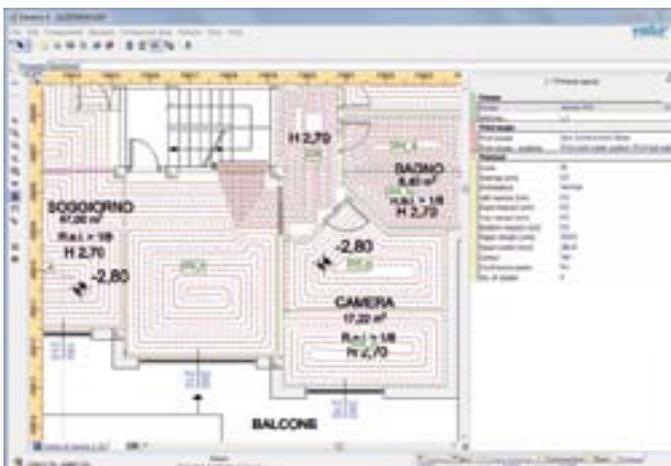
SILVESTRO SOFTWARE

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.

Rapid, simple, unique, Silvestro allows the user to design and calculate primary, direct and indirect parallel or secondary ventilation systems, both in a plan view and vertical elevation plan.

The strong points are many:

- 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 **160** in total, obtained around the world from the most severe certification bodies (figure updated on 14/02/2013), 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 low impact production processes in line with the Green Building principles.

THE VALSIR RANGE



WASTE SYSTEMS



SUPPLY SYSTEMS



GAS SYSTEMS



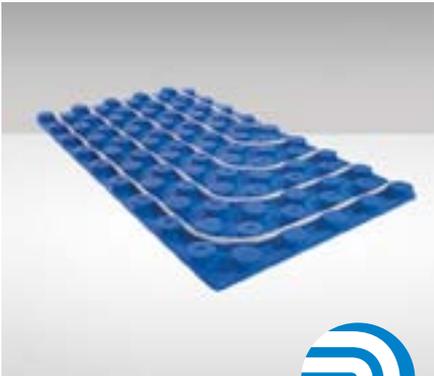
CISTERNS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



ACADEMY



LO2-534/0 - Febbraio 2013

VALSIR S.p.A.
 Località Merlaro, 2
 25078 Vestone (BS) - Italy
 Tel. +39 0365 877.011
 Fax +39 0365 81.268
 e-mail: valsir@valsir.it

www.valsir.it

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