



TRIPLUS

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

MADE IN ITALY



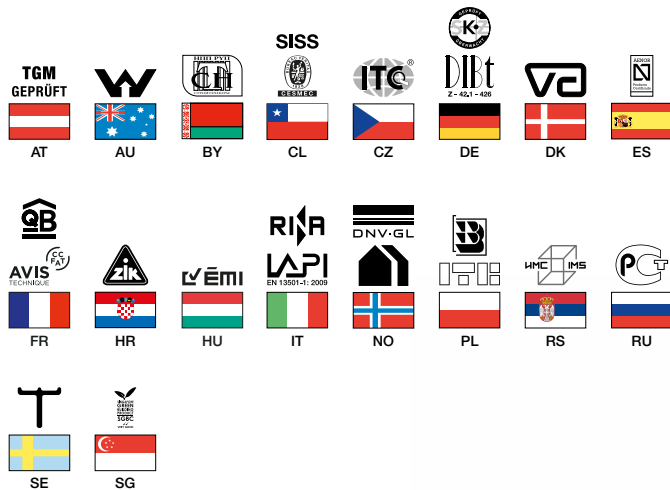
valsir[®]
QUALITY FOR PLUMBING



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

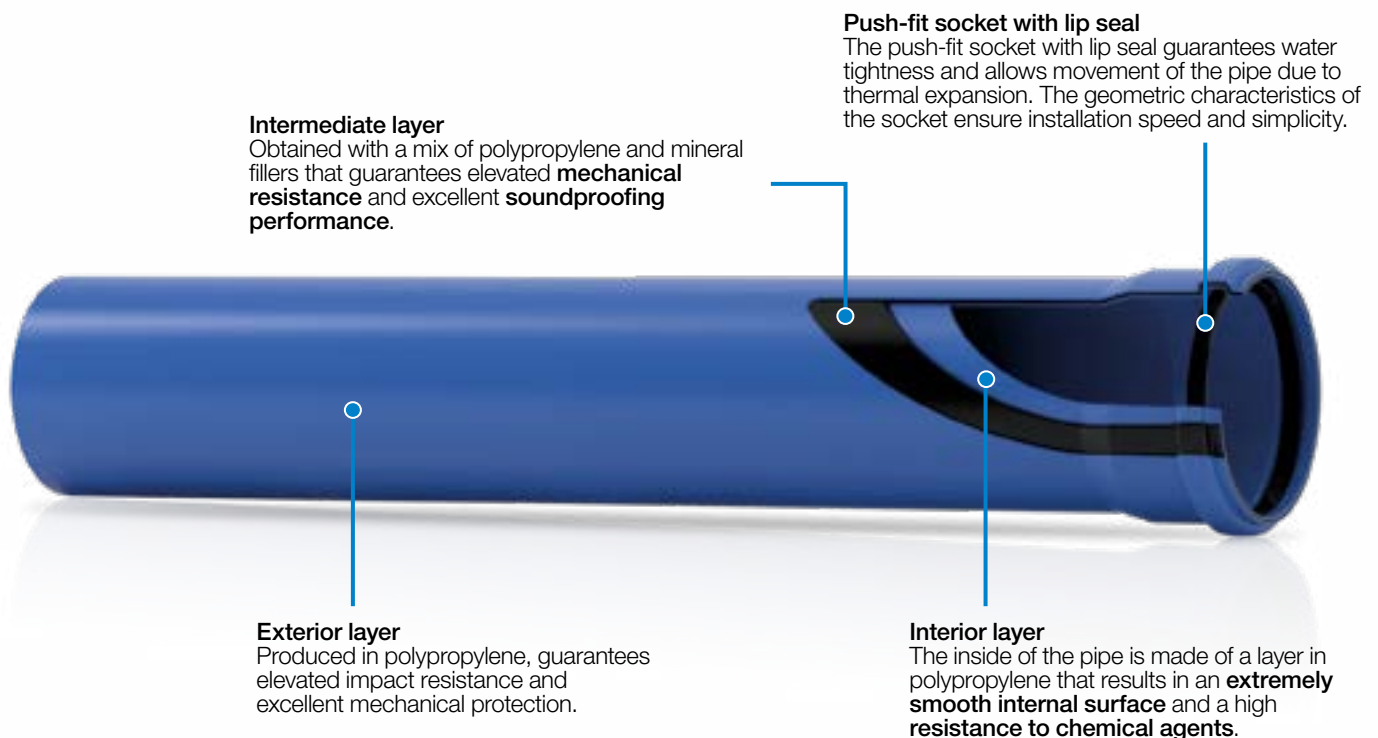


Viceroy Hotel Yas Island F1 Circuit (Abu Dhabi, United Arab Emirates)

CHARACTERISTICS OF EXCELLENCE

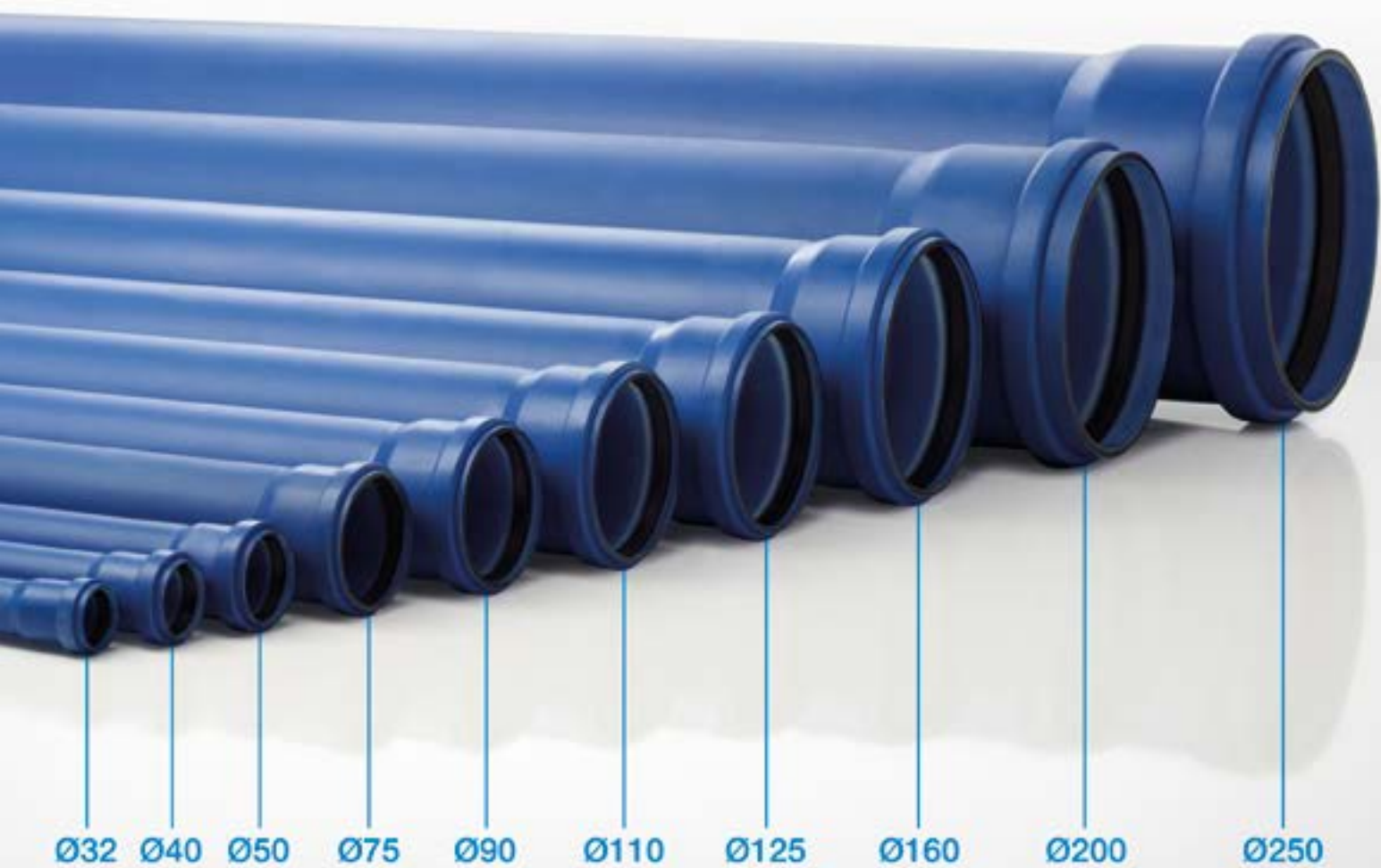
The advantages of using the Triplus® waste system

- **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 (MD)** 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 collars

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 collars 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 **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**.

ADVANCED SOLUTIONS

Valsir was the **first company that supplied a triple layer waste system with a VBF (Ventilation Branch Fitting System)**. 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 allows great advantages and huge savings thanks to the possibility of creating single stacks (therefore without need for parallel ventilation) in the **diameters 110 mm and 160 mm** with more than double waste flow rate if compared to primary ventilation.

The ideal solution for high rise buildings

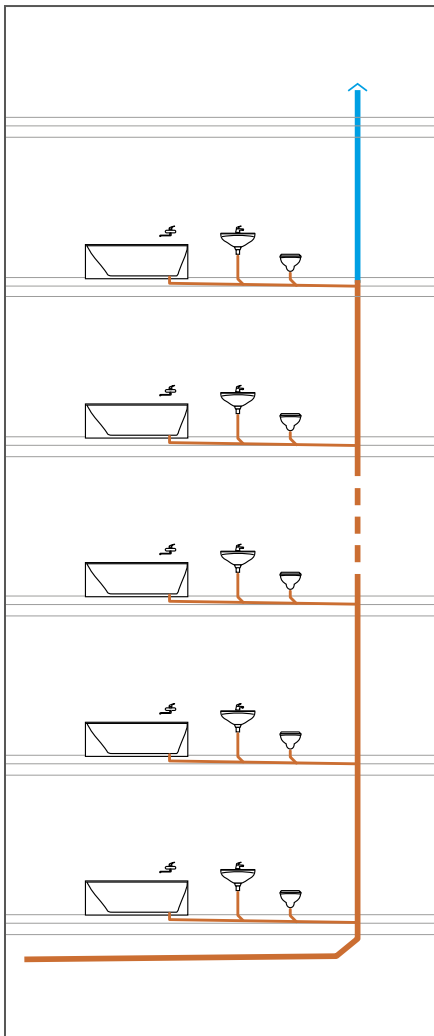
- **One soil stack**, no separate ventilation pipes required.
- **Increase in stack load** in comparison with conventional systems.
- **Reduction in speed** of effluents.
- **Excellent ventilation** of the stack and branches of each floor.
- **Up to 6 connections** on one branch fitting.
- **Up to 100* flats** with VBF 110 and **up to 448* flats** with VBF 160 connected to the same waste stack.

* An "average apartment" is composed of a kitchen with sink and dishwasher (max. capacity 6 kg) and a bathroom with basin, bathtub, washing machine, bidet and water closet (with 9 l flush cistern) for a total flow of 6.7 l/s. The calculation takes into account a simultaneity coefficient of K=0.5.

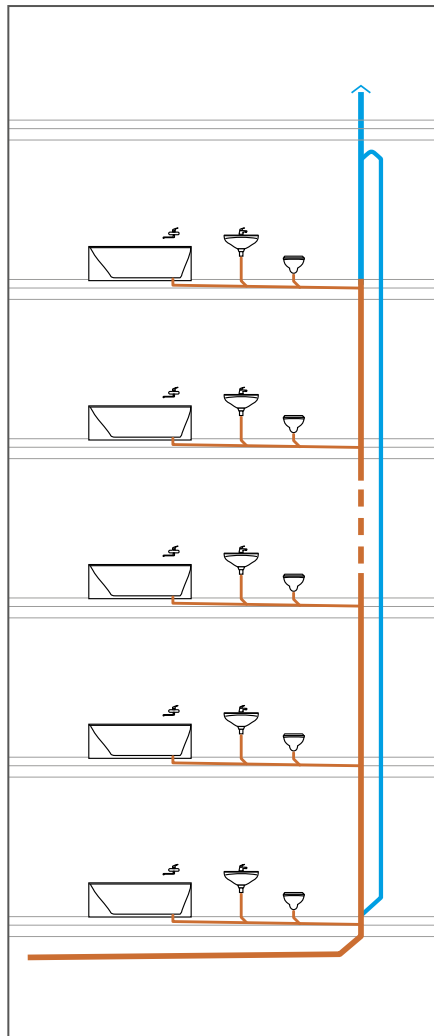


Waste systems with Triplus® VBF (Ventilation Branch Fitting System) allow greater stack loads than any other waste system (systems with primary ventilation, systems with direct or indirect parallel ventilation, systems with secondary ventilation).

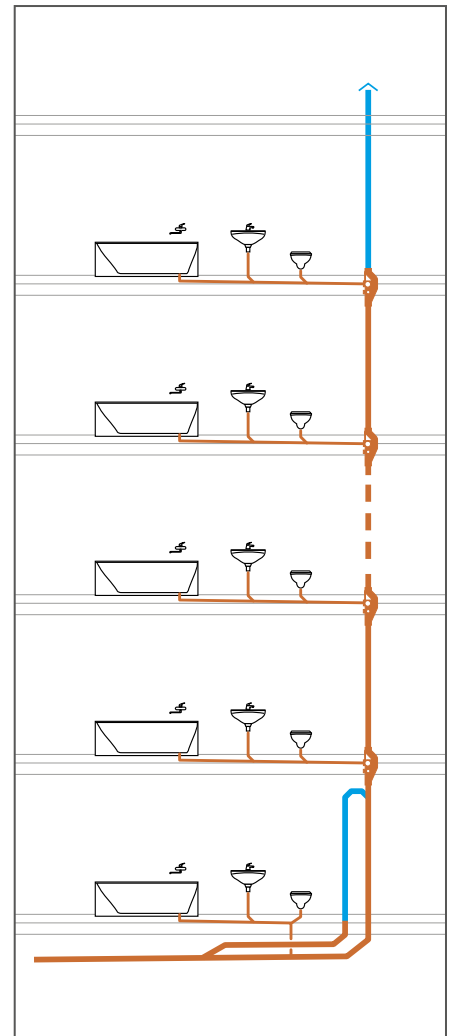
System with primary ventilation



System with parallel ventilation



System with VBF



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

Drainage capacity **225% 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.

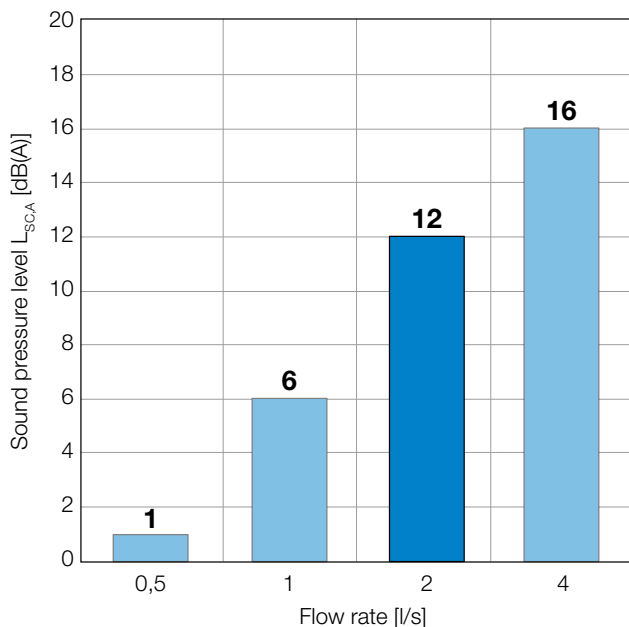
Most of the noise generated spreads inside the pipe but the vibrations that are generated are transmitted from the walls of the pipe to the surrounding area and to the bracketing systems and consequently to the building structure.

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.

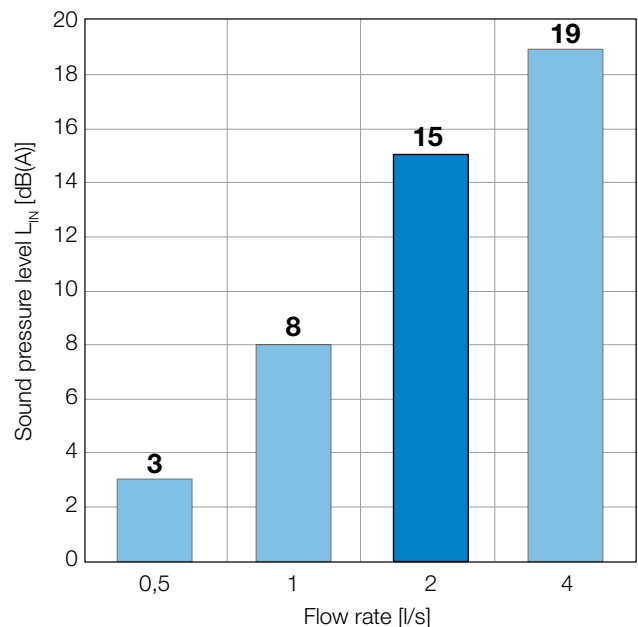
Triplus® allows waste systems to be installed that guarantee excellent soundproofing performance, **with 2 l/s (typical toilet flush) noise emissions of 12 dB(A) were measured.**

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

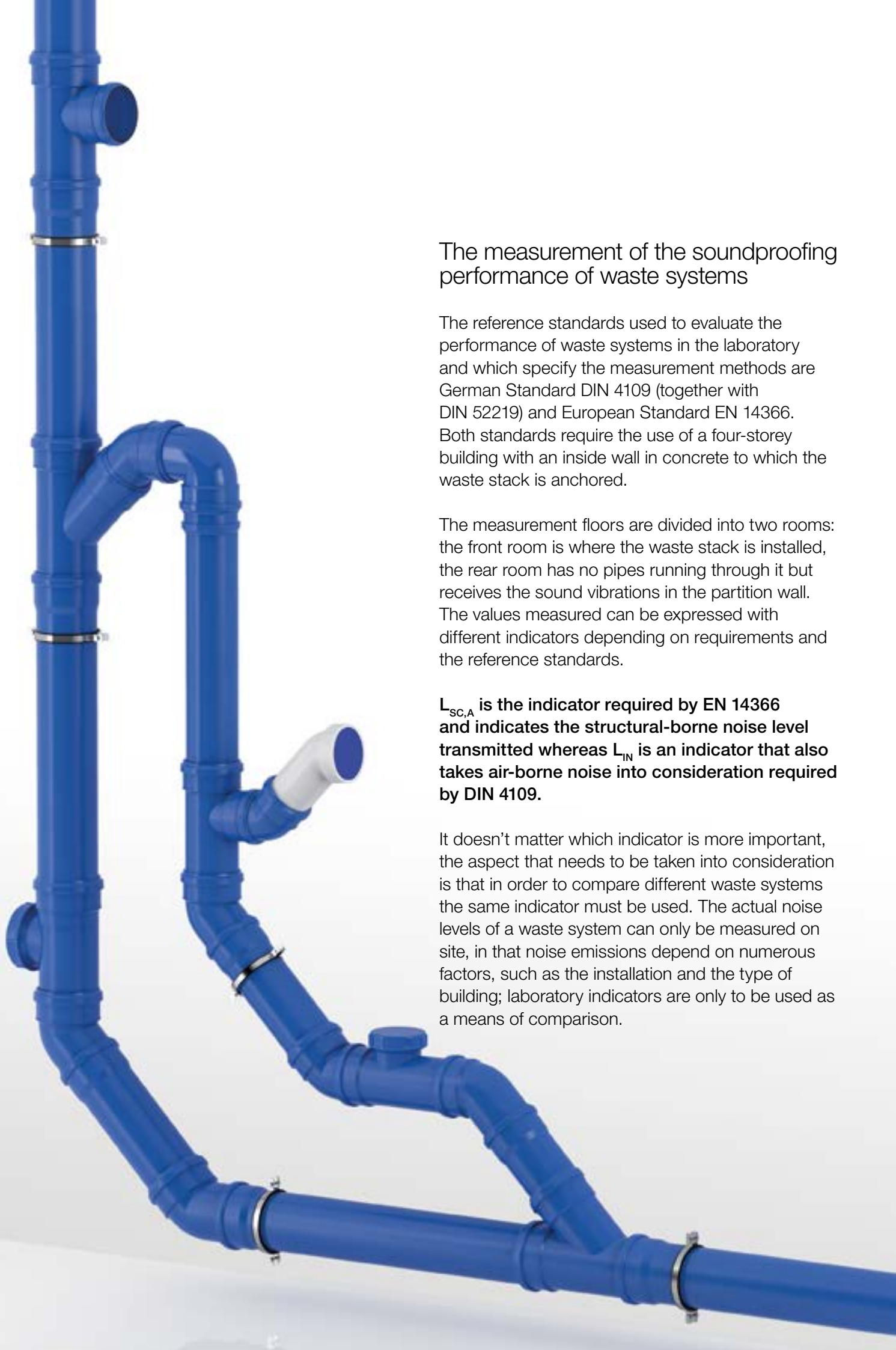
Sound pressure levels $L_{SC,A}$ of the Triplus® pipe in compliance with EN 14366



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



Certificate P-BA 225/2006 in accordance with EN 14366.
Certificate P-BA 226/2006 in accordance 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 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.



Altair
(Colombo, Sri Lanka)

REFERENCES



Golubacka Monument (Golubac, Serbia)



Alila Hotel (Solo, Indonesia)



Le Meridien (Limassol, Cipro)



Crown Plaza Hotel (Muscat, Oman)



Home Limassol (Limassol, Cipro)

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.

QUALITY AND ENVIRONMENT

Quality

The constant commitment of Valsir in the production of quality products is attested by over **200 product approvals** obtained throughout the world by the most stringent certification bodies (data updated to 01/03/2022), by a Management System of the Quality (QMS) certified in compliance with the **UNI EN ISO 9001:2015** standard and the Energy Management System (SGE) certified according to the international standard **UNI EN ISO 50001:2018**. Valsir S.p.A. has further demonstrated its commitment to the environment by obtaining certification **ISO 14001:2015** on the Vestone production site.

Since 2019 an innovative and modern plant has also been built that, integrated with the already installed photovoltaic park, will be able to produce over 30% of the electricity needed for all Valsir plants. This is a Trigenerator powered by methane gas capable of producing electricity, steam and cooling energy.



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 3th Sustainability Report that gathers facts and figures relating to the daily commitment of Valsir in terms of social, economic and environmental responsibility.



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WASTE SYSTEMS



SUPPLY SYSTEMS



GAS SYSTEMS



FLUSHING SYSTEMS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



HRV SYSTEM



ACADEMY



SEWER SYSTEMS



WATER TREATMENT



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QUALITY FOR PLUMBING



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