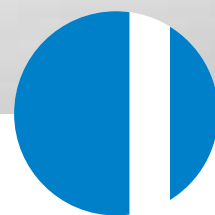


SILERE



**Soundproof waste and drainage
system inside the buildings**



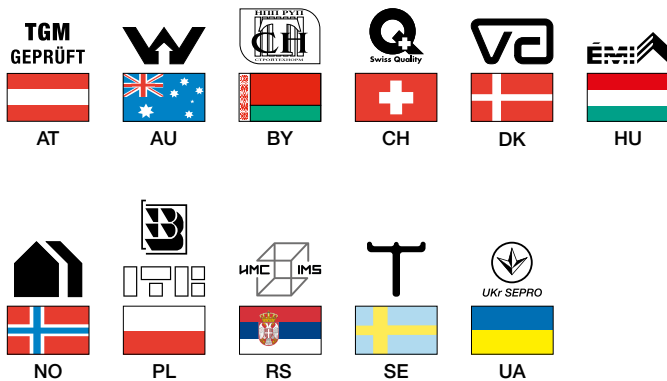
valsir[®]
QUALITY FOR PLUMBING



Distillery Hill - Sydney (Australia)

REFINERY DE

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.

MADE IN ITALY



Grand Hotel Savoia - Genova (Italy)

PERFORMANCE WITHOUT COMPROMISE

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.

Push-fit socket with lip seal

The push-fit socket is fitted with a lip seal that guarantees hydraulic tightness and free movement of the pipe caused by heat expansion. The shape of the socket ensures speed and ease of installation.

Single layer of high thickness material

The entire wall of the pipes and fittings is made up of the same mix of polypropylene and mineral loads which guarantees high **mechanical resistance, excellent soundproofing performance, extremely smooth internal surfaces and high resistance to chemical agents**.

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.



Ø58

Ø78

Ø90

Ø110

Ø135

Ø160

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**.

ADVANCED SOLUTIONS



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

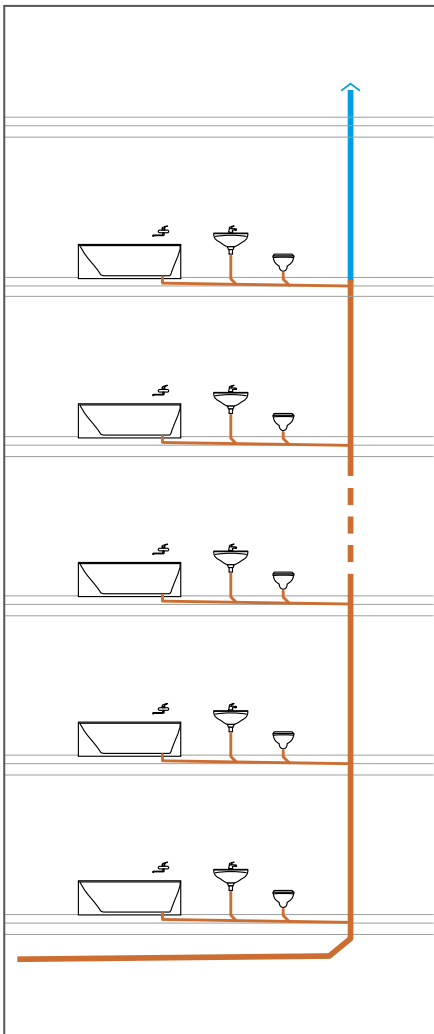
- **Single soil stack**, a parallel ventilation stack is therefore not required.
- **Increase in drainage flow** in comparison with conventional systems.
- **Reduction in speed** of waste flow.
- **Excellent ventilation** of the stack and branches of each floor.
- **Up to 6* connections** on one branch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

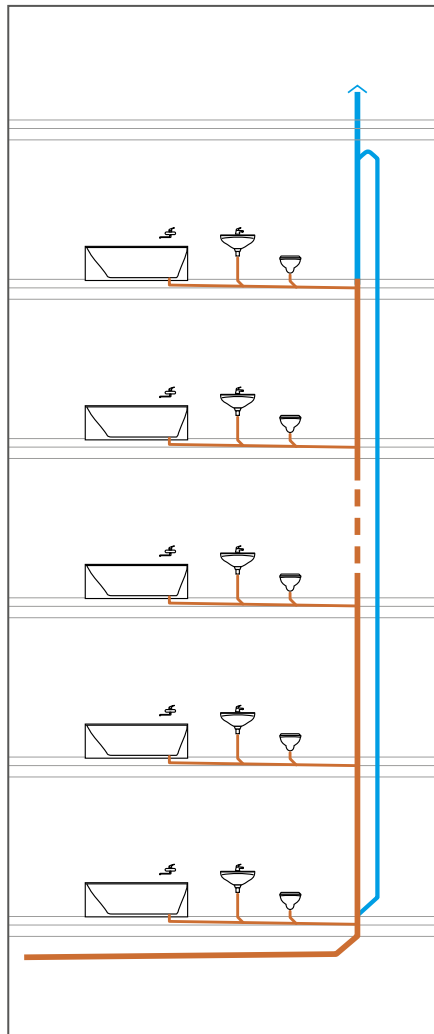
** The number of apartments depends on the composition of the same.

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).

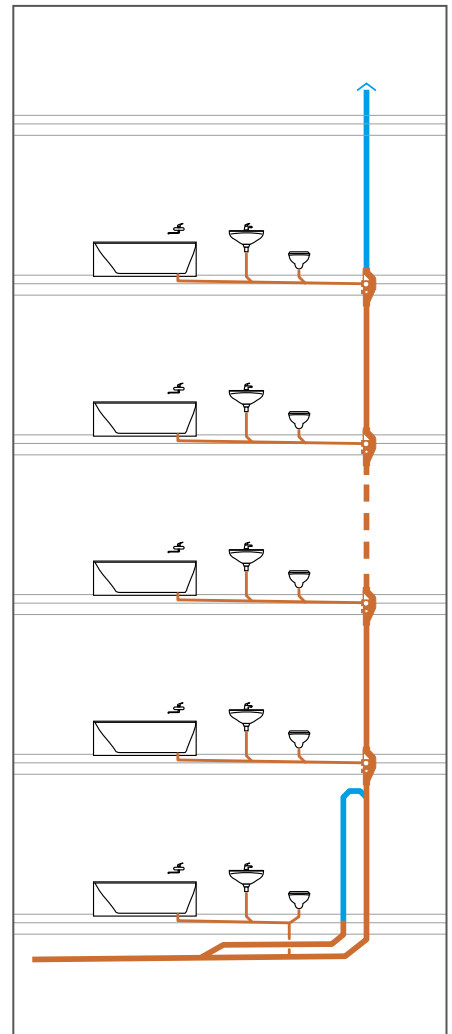
System with primary ventilation



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.

EXCELLENCE IN SOUNDPROOFING PERFORMANCE

When a waste system is in operation, noises originate inside the pipework which vibrates due to the fall of the liquid being discharged.

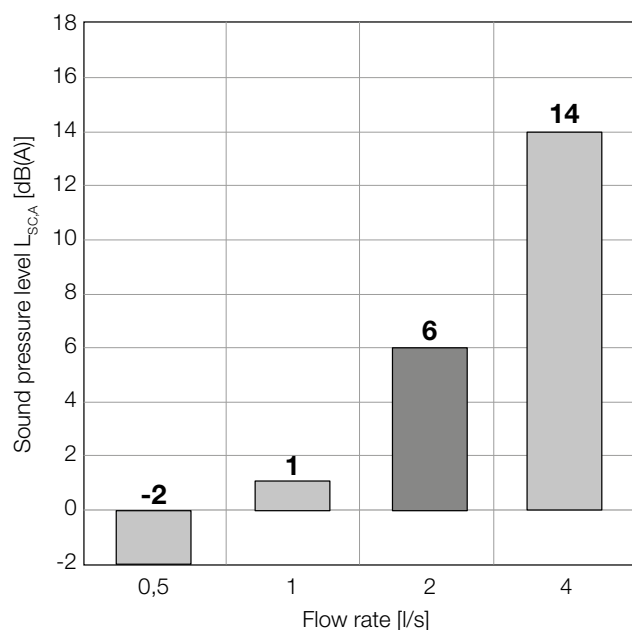
Most of the noise propagates inside the pipe, however, the vibrations generated are transmitted from the walls of the pipe to the surrounding area, to the pipe anchoring system and consequently to the building structure.

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.

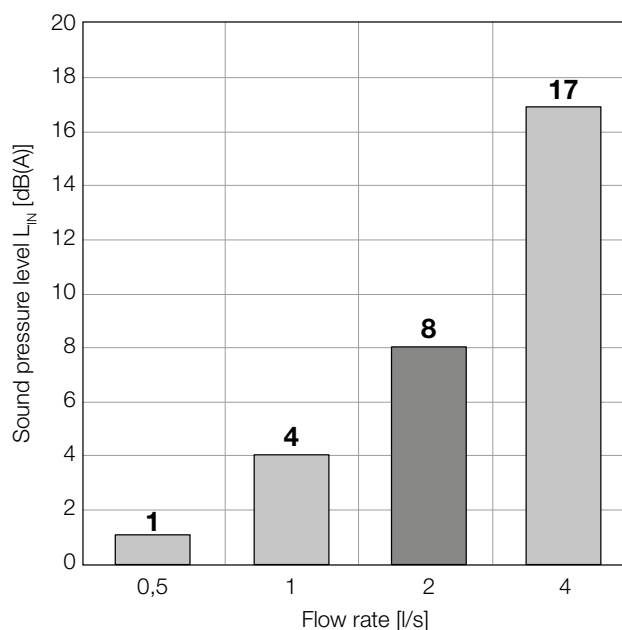
Silere® is a top sound insulating product that was designed with the aim of providing high performing sound insulated waste systems, in fact, with a waste flow of 2 l/s (represents the typical discharge rate of a WC) noise levels of 6 dB(A) were measured.

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.

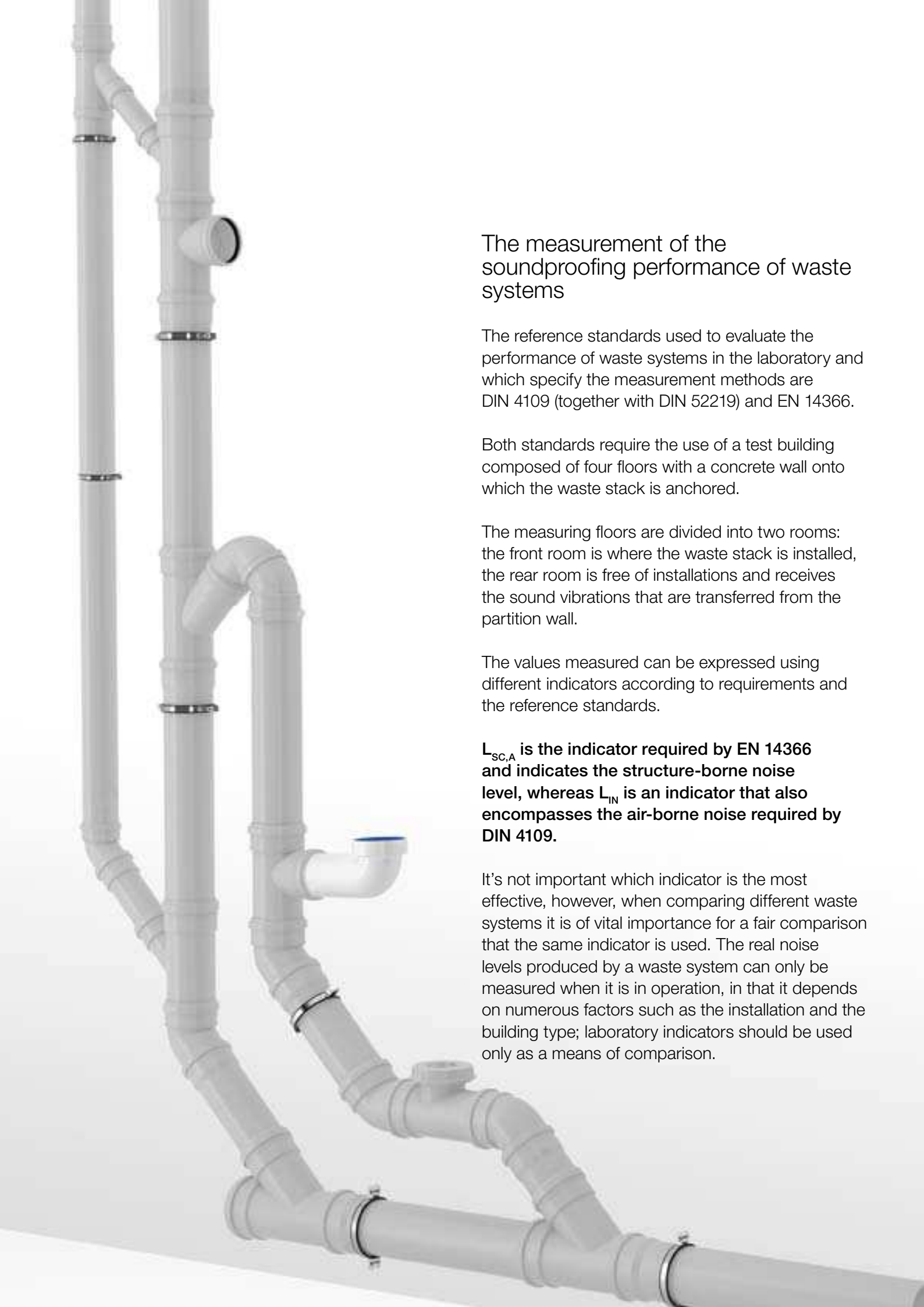
Levels of sound pressure $L_{SC,A}$ of Silere® pipe in compliance with EN 14366



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



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 DIN 4109 (together with DIN 52219) and EN 14366.

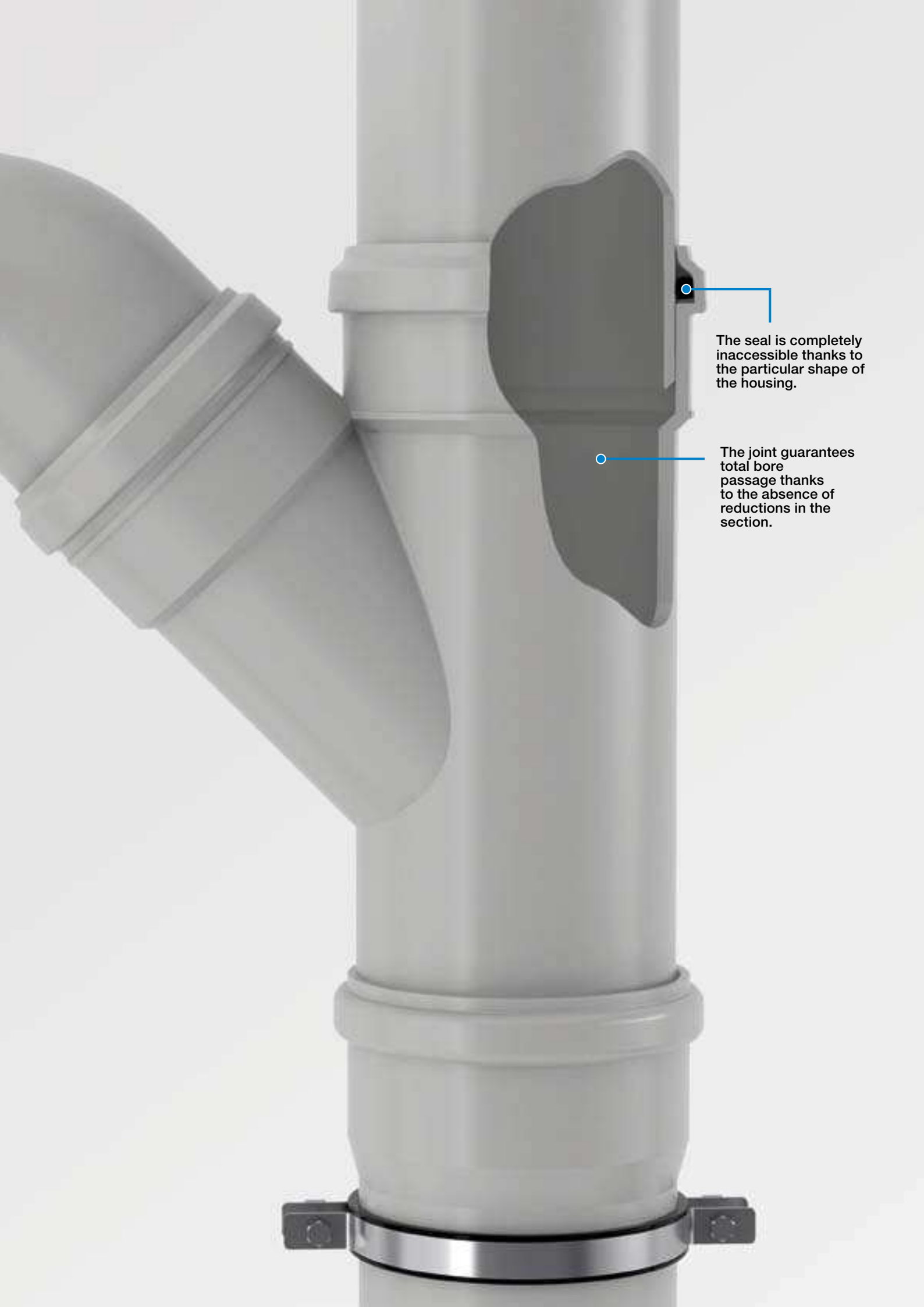
Both standards require the use of a test building composed of four floors with a concrete wall onto which the waste stack is anchored.

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.

$L_{SC,A}$ 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)



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

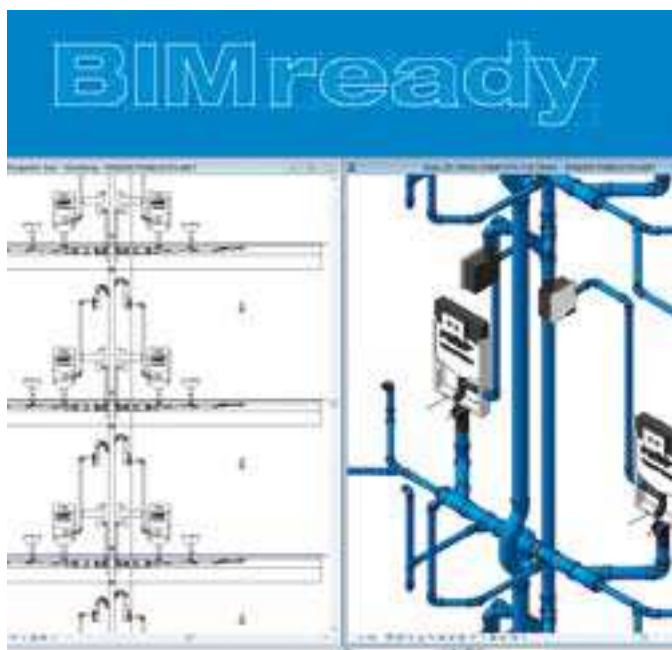
Valsir has an important training facility - **Valsir Academy** - dedicated to clients, distributors, plumbers and planners that provides perfectly equipped courses, theoretical and practical courses on the use and the design of plumbing and heating systems. Courses are provided both inside the training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

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**.

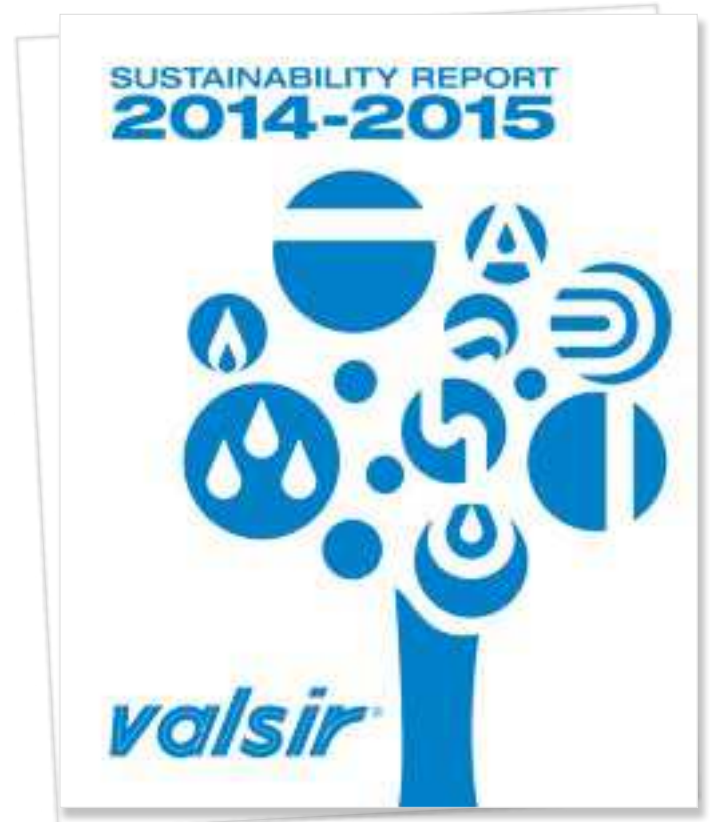


Sustainability

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.



Download
valsir.it/u/sostenibilita-en

PLUMBING

WASTE SYSTEMS



SUPPLY SYSTEMS



GAS SYSTEMS



FLUSH SYSTEMS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



HRV SYSTEM



ACADEMY



SEWER SYSTEMS



WATER TREATMENT



BUILDING

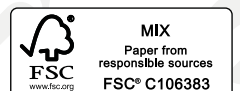
valsir[®]
QUALITY FOR PLUMBING

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Soggetta all'attività di direzione e coordinamento ex art. 2497 bis C.C. da parte di Fondital Group S.p.A. - Codice Fiscale 02075160172

L02-535/1 - Gennaio 2017



TECHNICAL DATA SHEET

VALSIR® WASTE SYSTEMS

SILERE

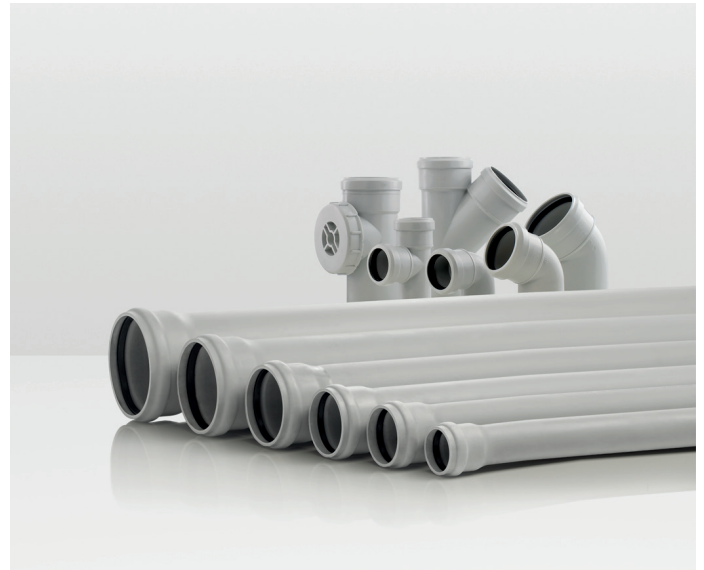


valsir®
QUALITY FOR PLUMBING

The product

The Valsir Silere® product line is composed of push-fit pipes and fittings and accessories that guarantee sound-reducing properties in waste systems, in compliance with the standards and regulations in force. This product line is suitable for the construction of high and low temperature waste systems, for the ventilation of waste systems and for rainwater drainage inside civil and industrial buildings, hospitals, hotels, etc.

The system is characterised by a large wall thickness and high specific weight which make it possible to reach a soundproofing performance that is one of the best available on the market today



Characteristics

- Excellent soundproofing performance; the system offers low noise levels of 6 dB(A) with flows of 2 l/s.
- Absolute guarantee of watertight joints, thanks to the elastomeric seal (factory fitted), that do not require the use of any special tools, glues or solvents and which simplifies installation.
- Wide range of diameters from OD 58 mm to OD 160 mm and the availability of transition accessories for connection to existing waste systems in different materials such as cast iron, PE, PVC, etc.
- Excellent impact resistance even at low temperatures.
- High resistance to a wide range of chemical compounds also at high temperatures; not affected by stray currents.
- An high abrasion resistance and extremely smooth internal surfaces guarantee minimal pressure losses and no deposit formation.
- Pipes are available in various lengths (from 150 mm to 3 m) and by using the dual socketed pipes and fittings (sliding double socket) material wastage is avoided.

Figura Layering of the pipe.

Push-fit socket with lip seal

The push-fit socket is fitted with a lip seal that guarantees hydraulic tightness and free movement of the pipe caused by heat expansion. The shape of the socket ensures speed and ease of installation.



Single layer of high thickness material

The entire wall of the pipes and fittings is made up of the same mix of polypropylene and mineral loads which guarantees high mechanical resistance, excellent soundproofing performance, extremely smooth internal surfaces and high resistance to chemical agents.

Technical details

Tabella Typical technical details.

| Property | Value | Test method |
|--|--|--|
| Pipe material | Mix of polypropylene and mineral loads | - |
| Fitting material | Mix of polypropylene and mineral loads | - |
| Seal material | SBR rubber | - |
| Colour | RAL 7035 | - |
| Sizes | 58÷160 mm | - |
| Application | High and low temperature waste and drainage systems inside the building or anchored externally to the walls of the building (application area B) or laid directly in concrete; ventilation of waste systems; gravity rainwater drainage systems. | - |
| Connections | Push-fit socket connection with rubber seal. | - |
| Minimum temperature of use | -20°C | - |
| Maximum temperature of waste water | +95°C (intermittent) +80°C (continuous) | - |
| Minimum pressure | -500 mbar ⁽¹⁾ | - |
| Maximum pressure | +1.5 bar ⁽²⁾ | - |
| Composition of waste water | pH 2÷12 | - |
| Soundproofing performance ⁽³⁾ | $L_{SC,A}$ =6 dB(A) with flow of 2 l/s, measurement performed on ground floor, behind the installation wall with 2 clips per floor | EN 14366 |
| | L_{N} =9 dB(A) with flow of 2 l/s, measurement performed on ground floor, behind the installation wall with 2 clips per floor | DIN 4109 |
| | $R_w + C_{tr}$ 46 without pipe cladding and with 13 mm plasterboard wall and 75 mm R1.5 insulation, evaluation performed with flow of 2 and 4 l/s. | Building Code of Australia (Part F5.6) |
| Density at 23°C | 1600 kg/m ³ | EN ISO 1183-2 |
| Elasticity modulus | 2800 MPa | ISO 527-2 |
| Tensile strength | ≥ 14 MPa | ISO 527-2 |
| Ultimate elongation | ≥ 80% | ISO 6259-3 |
| Crystalline melting temperature | ≥ 160°C | EN 728 |
| Linear heat expansion coefficient | 0.08 mm/m·K | - |
| UV resistance | Suitable for use outdoors ⁽⁴⁾ . Suitable to be stored outdoors (for periods not exceeding 18 months). | - |
| Halogen content | Halogen-free | - |
| Fire resistance | Euroclass C-s3,d0 | EN 13501-1 |
| Reference construction standard | EN 1451-1 - WMTS-508:2013 - NBK 19 | - |
| Packaging | Large diameter pipes are supplied in wooden frames with strapping, small diameter and short pipes are wrapped in shrink film. Fittings are wrapped in shrink film. | - |

(1) The system is suitable for the creation of central dust collection systems. The values indicated refer to 20°C.

(2) The system is suitable for gravity waste and drainage systems, the value indicated refers therefore to the maximum pressure that can be applied during system testing at 20°C.

(3) For greater detail refer to chapter 2 "Noise in waste systems".

(4) Provided protected from direct sunlight, for example, using a special protective paint.

Application field

The Valsir Silere® pipes and fittings meet the requirements of the EN 1451 Standard and can be used inside buildings for residential and industrial use and in particular for the following applications:

- a) Waste systems for transporting domestic waste waters (low and high temperature).
- b) Ventilation pipes connected to the waste systems previously indicated.
- c) Rain water systems inside the structure of the building.

As prescribed in the European Standard EN 1451 the Valsir Silere® pipes are suitable for applications identified with the “B” marking that identifies pipes and fittings for use inside the building or outside, anchored to a wall.

Dimensions

The diameters, the wall thickness and the relative tolerances of the Valsir Silere® pipes are indicated in the following table.

Tabella Pipe dimensional characteristics.

| Nominal diameter DN [mm] | External diameter OD [mm] | Thickness s [mm] | Application area |
|-----------------------------|---|---|------------------|
| 50 | 58 $\begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ | 4.0 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ | B |
| 70 | 78 $\begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$ | 4.5 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ | B |
| 90 | 90 $\begin{smallmatrix} +0.4 \\ 0 \end{smallmatrix}$ | 4.5 $\begin{smallmatrix} +0.6 \\ 0 \end{smallmatrix}$ | B |
| 100 | 110 $\begin{smallmatrix} +0.4 \\ 0 \end{smallmatrix}$ | 5.4 $\begin{smallmatrix} +0.7 \\ 0 \end{smallmatrix}$ | B |
| 125 | 135 $\begin{smallmatrix} +0.4 \\ 0 \end{smallmatrix}$ | 5.6 $\begin{smallmatrix} +0.7 \\ 0 \end{smallmatrix}$ | B |
| 150 | 160 $\begin{smallmatrix} +0.5 \\ 0 \end{smallmatrix}$ | 5.6 $\begin{smallmatrix} +0.7 \\ 0 \end{smallmatrix}$ | B |

Connection systems

Silere pipes and/or fittings use a number of connection methods:

- Connection by means of push-fit fitting.
- Connection by means of a sliding sleeve.
- Connection by means of a bi-joint sleeve.

Approvals:

The approvals of Valsir® waste systems are available on the website: www.valsir.com

Marking

Tabella Pipe marking.

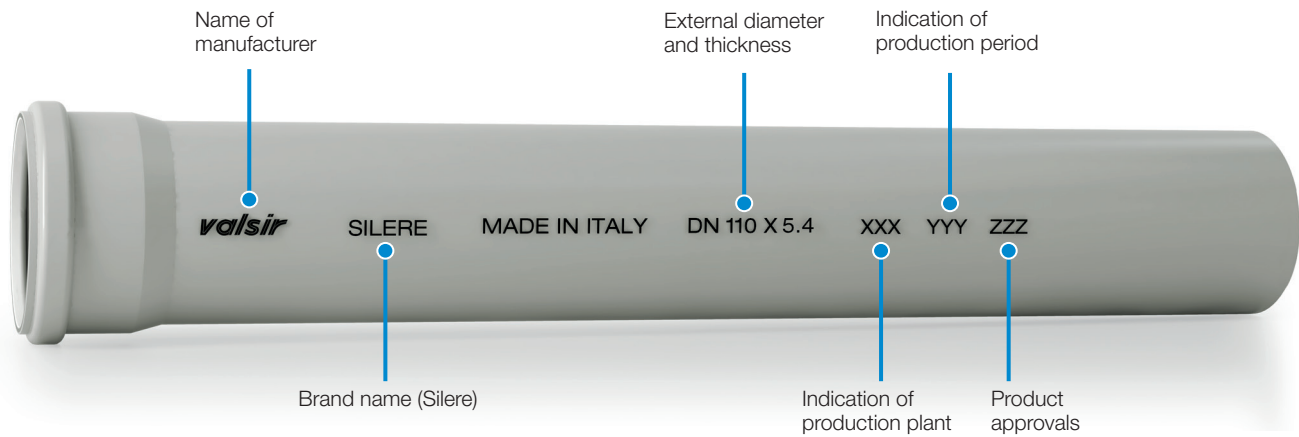
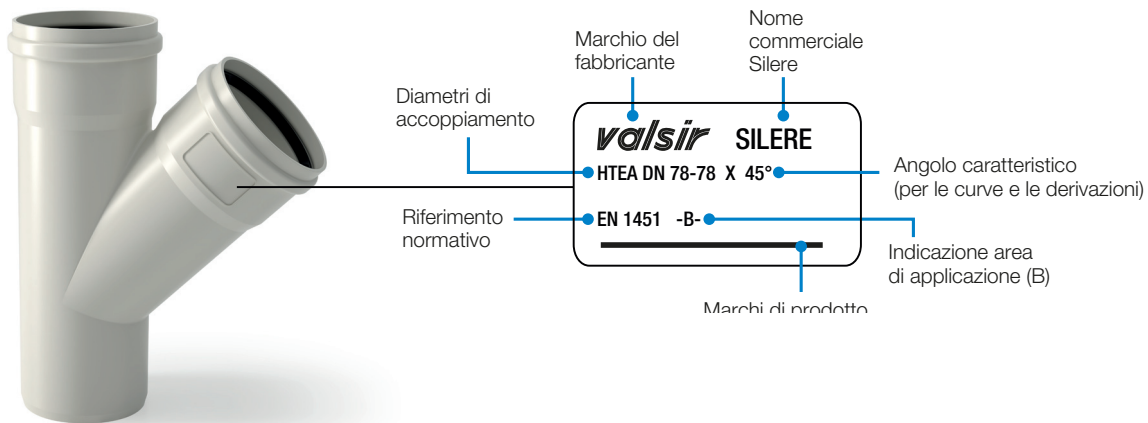


Tabella Fitting marking.

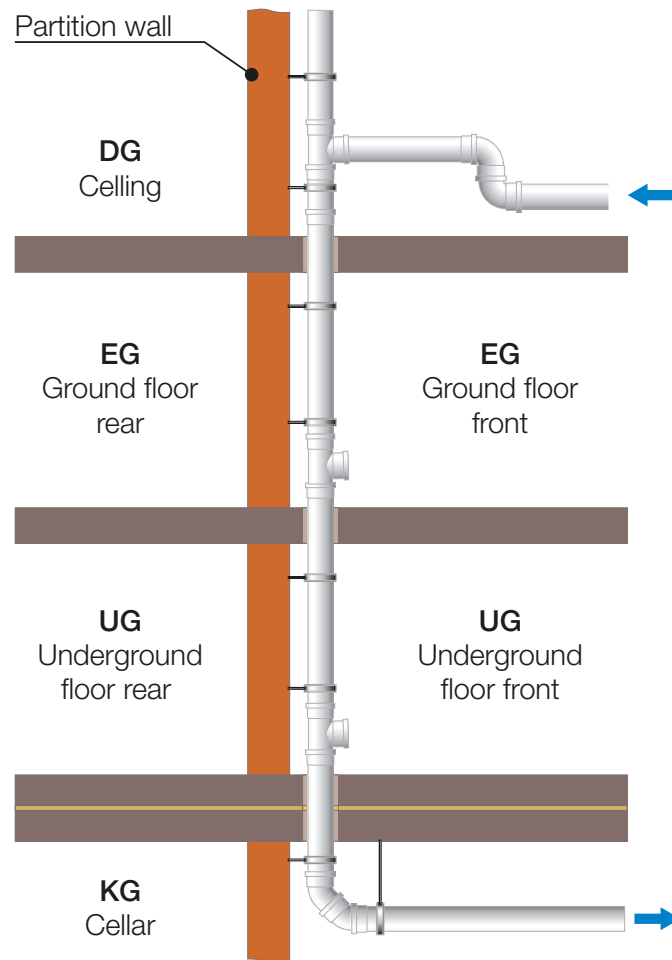


Acoustic performance: the test methods

The reference standards used for the tests are UNI EN 14366:2004 and DIN 4109:1989 (together with DIN 52219:1993) that specify the measurement methods and the evaluation of the results. The test building is made up of a completely insulated room with thick walls made of a sound absorbing material of high quality.

It is a real buildings with four floors (with an internal height of 3050 mm), two of which, indicated in the figure as EG and UG, are the reference floors for noise detection divided by a wall made of concrete with a weight of 220 kg/m² (250 kg/m² for the European Standard UNI EN 14366) to which a waste stack is anchored.

The measurement floors are each divided into two rooms: the front room is where the pipe is installed, the back room contains no installation and picks up the noise vibrations transferred to the partition wall; the back rooms have a volume of 70.4 m³ (surface area of about 23 m²) while the front rooms are 52.6 m³ (surface area of about 17 m²).



The waste flow (continuous) is ensured by means of a pumping station that guarantees a precision of 5% and which supplies different levels of flow in relation to the internal diameter of the pipe as can be seen in Table 2.7. The acoustic pressure levels are measured in third octaves with frequencies from 100 Hz to 5000 Hz.

Measurement flow in relation to the dimensions of the waste pipe to be tested.

| Internal diameter of the pipe [mm] | $70 \leq Di < 100$ | $100 \leq Di < 125$ | $125 \leq Di < 150$ |
|------------------------------------|--------------------|---------------------|---------------------|
| Measurement flows [l/s] | 0.5 - 1 | 0.5 - 1 - 2 - 4 | 0.5 - 1 - 2 - 4 - 8 |

The acoustic results

The testing campaign involved numerous tests being carried out in 1997, 1998, 2004, 2006 and 2014 and the excellent results obtained following the development of the Valsir® waste systems are indicated in the diagrams and tables which follow. The tests were carried out both with 2 clips per floor and with 1 clip per floor as the latter represents the typical installation configuration in residential buildings. Consider that the values obtained were rounded up to whole numbers as requested by the reference standards.

Tabella Sound pressure levels measured behind the wall onto which the Valsir Silere® 110x5.6 piping was fitted, measurements performed and formulated by the Fraunhofer Institute of Stuttgart (Germany).

| Test pipes: Valsir Silere® | | | | | | |
|---|-------------------|--------------------|---------|---------|----------|---|
| Test conditions | Measurement floor | Flow rate of water | | | | Reference standard (Certificate) ^(a) |
| | | 0.5 l/s | 1 l/s | 2 l/s | 4 l/s | |
| | | Sound level | | | | |
| Index $L_{SC,A}$ measured behind the installation wall, with 2 clips per floor, pipe diameter OD 110 mm | UG | -2 dB(A) | 1 dB(A) | 6 dB(A) | 14 dB(A) | EN 14366 |
| Index L_{IN} measured behind the installation wall, with 2 clips per floor, pipe diameter OD 110 mm | EG | 1 dB(A) | 4 dB(A) | 8 dB(A) | 17 dB(A) | DIN 4109 |
| | UG | 2 dB(A) | 5 dB(A) | 9 dB(A) | 17 dB(A) | |
| Index L_{IN} measured behind the installation wall, with 1 clip per floor, pipe diameter OD 110 mm | EG | -1 dB(A) | 2 dB(A) | 6 dB(A) | 14 dB(A) | DIN 4109 |
| | UG | 1 dB(A) | 5 dB(A) | 9 dB(A) | 15 dB(A) | |

PLUMBING

WASTE SYSTEMS



SUPPLY SYSTEMS



GAS SYSTEMS



FLUSH SYSTEMS



BATHROOM SYSTEMS



TRAPS



RADIANT SYSTEMS



DRAINAGE SYSTEMS



HRV SYSTEM



ACADEMY



SEWER SYSTEMS



WATER TREATMENT



BUILDING

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