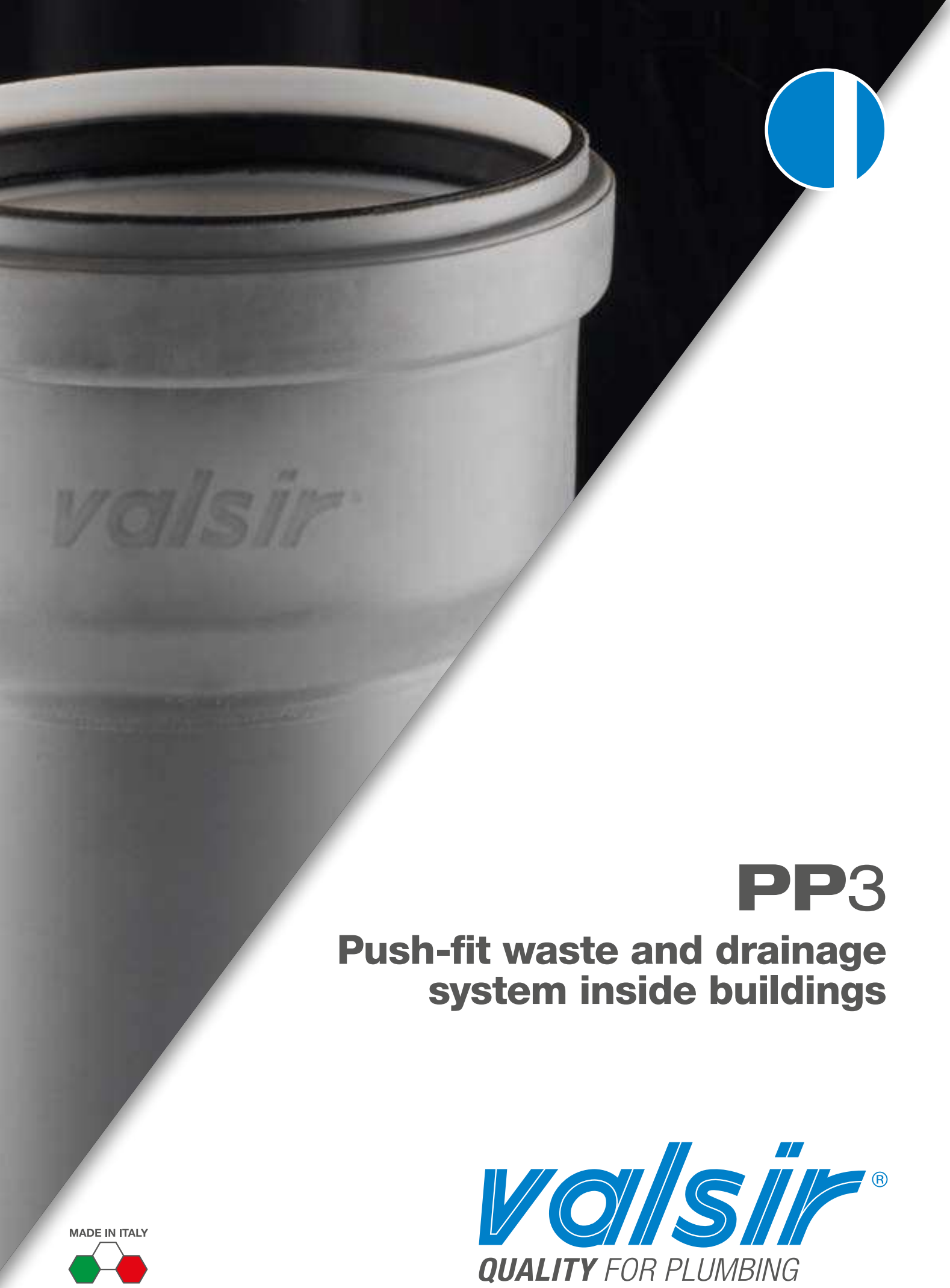


PP3

Push-fit waste and drainage system inside buildings

MADE IN ITALY

valsir®

QUALITY FOR PLUMBING

The Kingsbury Hotel - Colombo (Sri Lanka)

Valsir PP3®, the latest technology in push-fit systems

Valsir PP3® is a waste system made up of pipes, fittings and accessories for the construction of waste and rainwater drainage systems.

Valsir PP3® is an extremely light system and with its push-fit socket with hydraulic seal it represents the most simple solution for **the construction of waste and drainage systems**.

BY DE HU IT PL RO RU UA

Valsir PP3® is manufactured according to the European Standard EN 1451-1 and can be used for waste systems at low and high temperatures, ventilation systems for waste networks and for rainwater drainage systems **inside buildings for civil and industrial use, hospitals and hotels**.

The wide range of pipes, fittings and accessories allow the entire waste network to be made, from branches to sanitary appliances to stacks and waste manifolds.

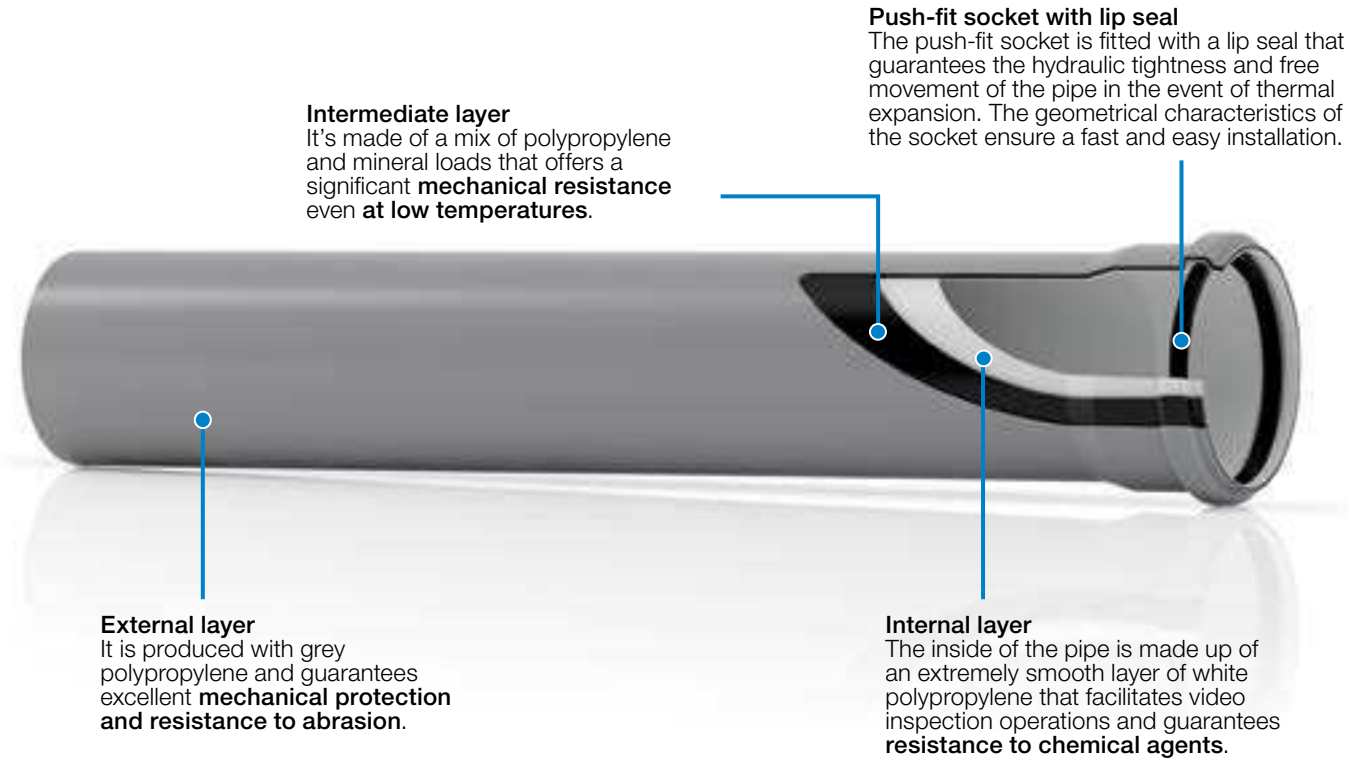
MADE IN ITALY

The Romanian Athenaeum - Bucharest (Romania)

LIGHT WEIGHT, SIMPLICITY AND RELIABILITY

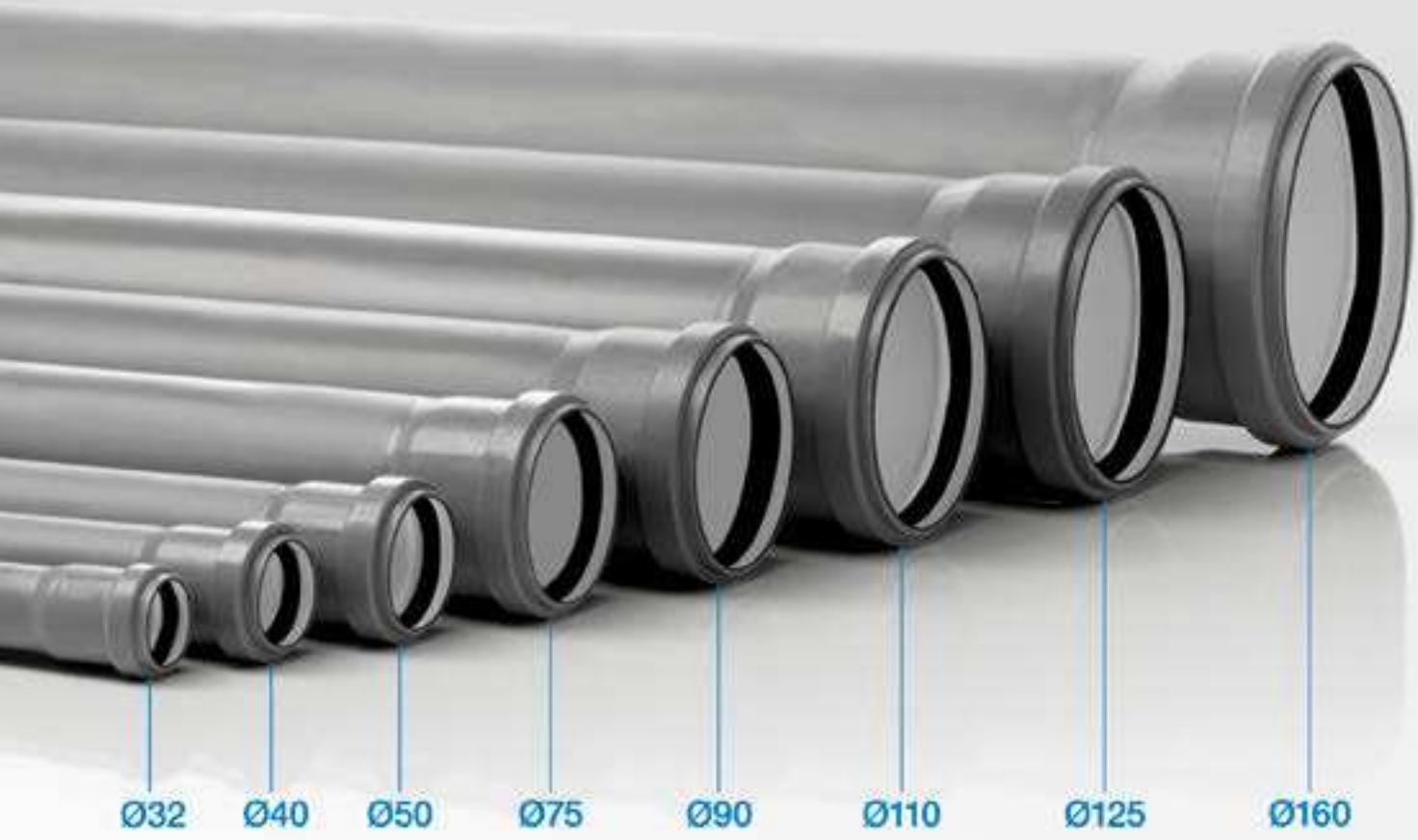
The advantages of using PP3® waste system

- **Light weight and ease of installation** on site without special tools, thanks to the push-fit connection. Furthermore, the push-fit socket does not require the use of harmful glues or solvents.
- Excellent sound insulating performances: 17 dB(A) with a flow rate of 2 l/s in compliance with EN 14366 (certificate P-BA 92/2014).
- **Smooth internal surface, white in colour** to facilitate video inspection.
- High impact resistance at extremely harsh temperatures **below 0°C**.
- **High chemical resistance** to the substances dissolved in civil and industrial waste waters.
- Wide range of **diameters from DN 32 mm to DN 160 mm** characterised by triple layer pipes and single layer fittings.
- Wide range of transition fittings for connection to other waste systems such as cast iron, PE, PP, PVC.
- The product, its recyclability and the production processes used are based on the **Green Building principles**, respecting the environment and the conservation of resources.



The Valsir PP3® waste system can transport waste liquids at temperatures as high as 95°C, it has a high resistance to the most common chemical agents and is characterised by an extremely smooth internal surface that prevents the accumulation of deposits inside the waste network.

Furthermore, polypropylene is a material that is not attacked by microorganisms and guarantees the absence of internal deposits and the build-up of bacterial flora. This system is also free of problems relating to stray currents.

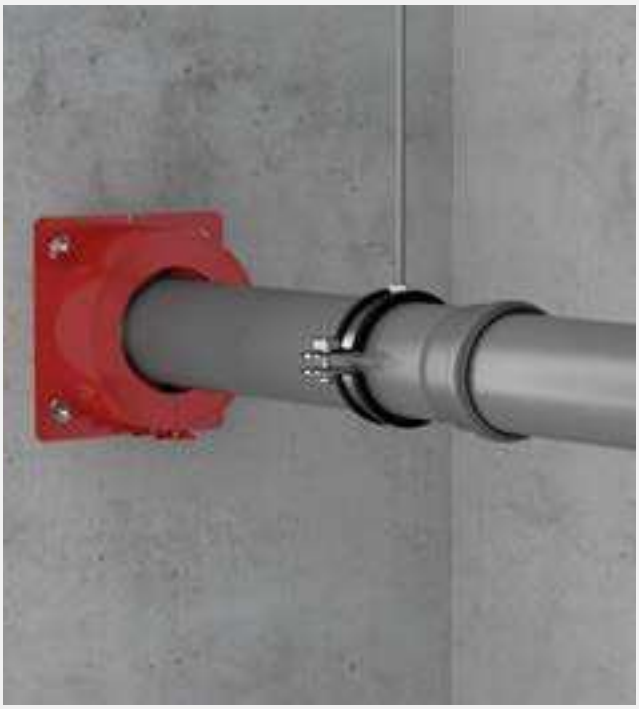

Ø32
Ø40
Ø50
Ø75
Ø90
Ø110
Ø125
Ø160

A COMPLETE RANGE FOR ALL REQUIREMENTS

The range is composed of pipe lengths from 150 mm to 3 m with one socket, two sockets or smooth pipes without sockets.

It features a wide choice of fittings and accessories that allow the most diverse system configurations to be constructed.
Diameters range from the smallest such as 32, 40 and 50 mm for the installation of branches on each floor to larger diameters such as 160 mm for waste manifolds.

The range completed by accessories for connection to other Valsir waste systems, accessories for connection to sanitary appliances and anchor brackets.



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 a **complete range** is available which covers diameters **from 40 to 160 mm**.

It is important to remember that the Valsir PP3® waste system is made of polypropylene 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**.

GTC 41 - Belgrado (Serbia)

THE BEST SOUNDPROOFING PERFORMANCE IN ITS CATEGORY

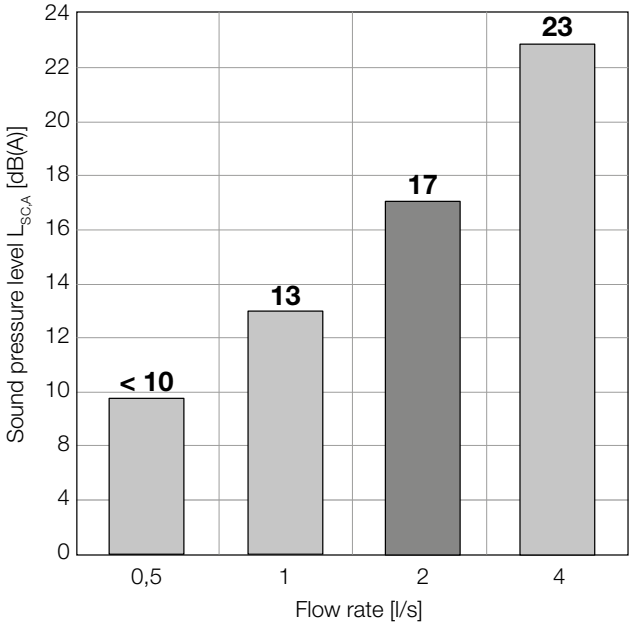
When a waste system is called into action, noises are generated inside the pipelines, causing them to vibrate from the fall of the liquid being discharged.

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

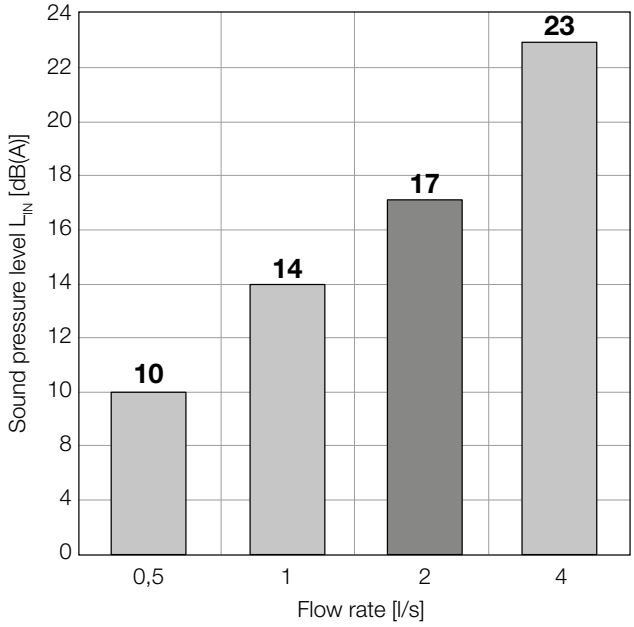
To limit noise levels in waste and drainage systems, not only should the system be designed properly and the waste circuit mounted correctly but it is also important to choose a drainage system with elevated soundproofing performance.

PP3® with 2 l/s (typical drainage from a WC) reaches noise levels of 17 dB(A).

Sound pressure levels $L_{SC,A}$ of the PP3 pipe in compliance with EN 14366



Sound pressure levels L_{IN} of the PP3 pipe in compliance with DIN 4109



Certificated P-BA 92/2014e in accordance with EN 14366.
Certificated P-BA 91/2014e in accordance with DIN 4109.

Athénée Palace Hilton - Bucharest (Romania)

The measurement of the soundproofing performance of waste systems

The reference standards used to assess the performance of waste and drainage systems in the laboratory and that specify the measurement methods are the German Standard DIN 4109 and the European Standard EN 14366.

Both standards require the use of a four-storey test 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 though it but receives the sound vibrations that are transferred to the partition wall.

The measured values can be expressed using different indicators depending on the requirements and 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. Noise emissions depend on numerous factors, such as the installation and the building type. Consequently, the actual noise level of a waste system can only be measured on site: laboratory indicators should only be used as a on means for 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

Valsir PP3® ensures a practical and rapid installation without glues or special tools thanks to the jointing system with push-fit sockets.

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 Valsir PP3® is extremely low compared to the most common plastic materials**, a 3 m pipe will expand in length by just 13 mm when the waste liquid flows at a continuous temperature of 60°C.

It is thanks to this low thermal expansion coefficient that the push-fit joints are capable of absorbing the variations in length of the pipe without taking any particular precautionary measures; just follow the installation instructions in the Valsir technical manuals.

The bi-joint sleeve to reduce wastage to a minimum

To allow leftover pieces of pipe to be used, Valsir supplies a bi-joint sleeve. This is a special fitting that allows two pipes without sockets to be connected guaranteeing hydraulic tightness without compromising flow rates.

Estate - Puegnago del Garda (Italy)

REFERENCES

Signature Lux Hotel - Johannesburg (South Africa)

Zazerkalie housing estate - Samara (Russia)

Peles Castle - Sinaia (Romania)

Pendergardens - St. Julian (Malta)

The Elements - Colombo (Sri Lanka)

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

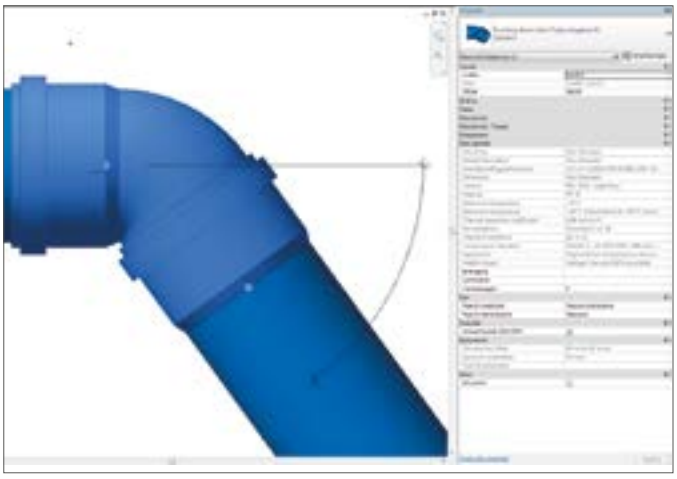
Valsir has an important training facility - **Valsir Academy** - dedicated to clients, distributors, plumbers and planners that provides perfectly equipped courses, both theoretical and practical on the use and the design of plumbing and heating systems. Courses are provided both inside the training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

VALSIR IS BIM-READY

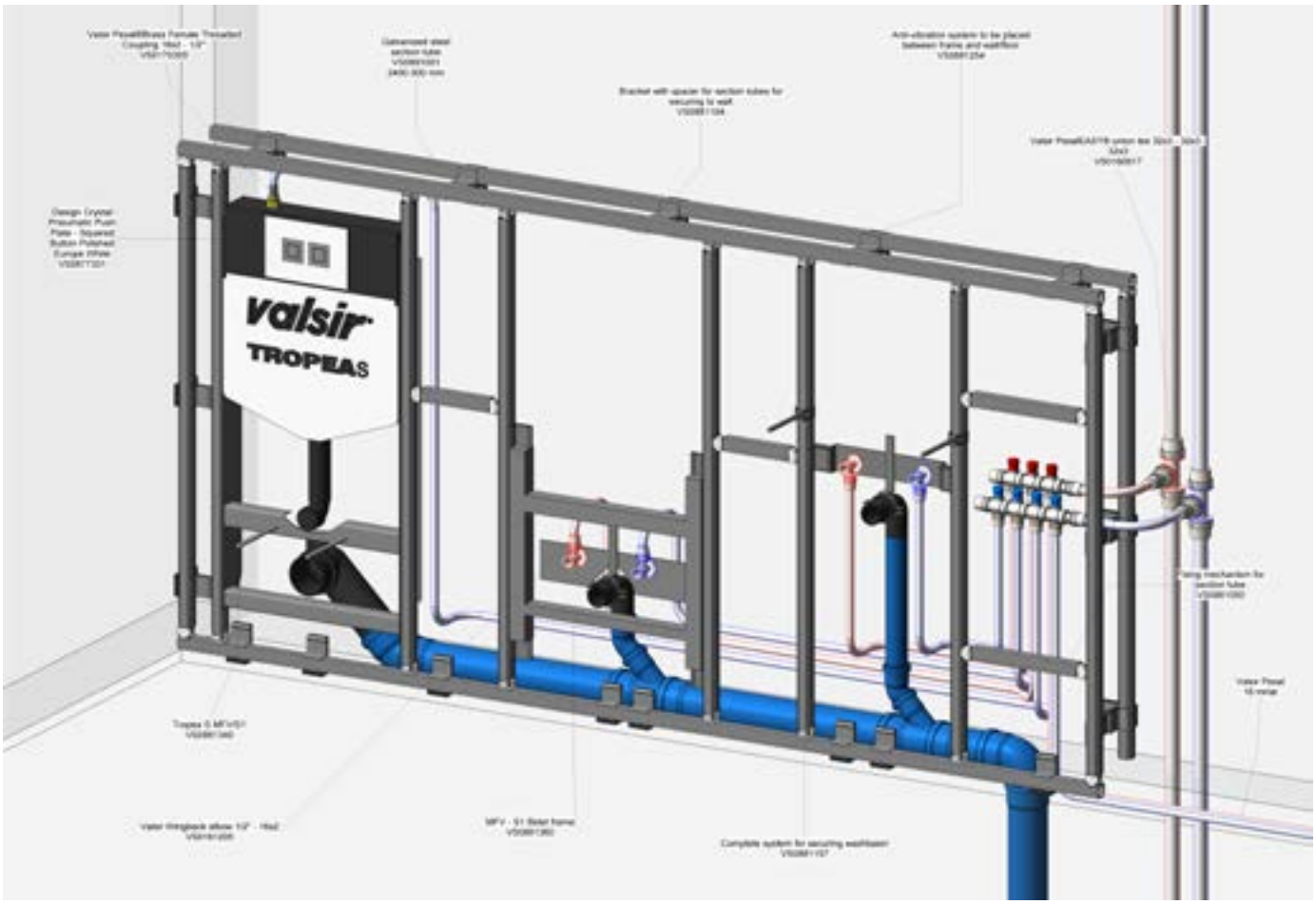
Valsir has adopted the BIM philosophy, the modelling process that allows to improve planning, design, construction and management of buildings, aligning with the industry transition to digital building modelling.

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 quality products is attested by over **200 product approvals** obtained throughout the world by the most stringent certification bodies (data updated to 01/05/2022), 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.

Download
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

GROUP SILMAR

valsir®

QUALITY FOR PLUMBING

L02-544/4 – Maggio 2022

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PP3®

TRIPLE-LAYER PUSH-FIT SYSTEM FOR INSTALLATION INSIDE BUILDINGS

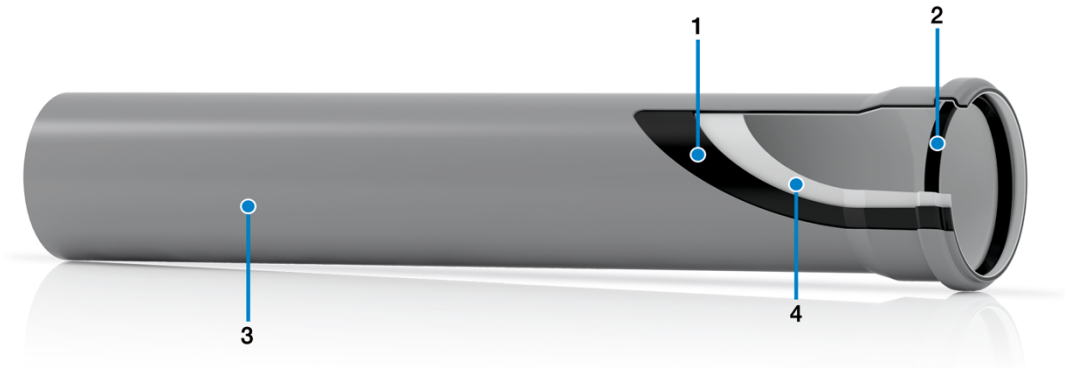
The product

Valsir PP3® is composed of triple layer pipes, fittings and accessories for the construction of waste, ventilation and rainwater drainage systems.
The extremely light weight and simple connections, thanks to the push-fit sockets with rubber seals, make it the most practical and economical solution for the construction of waste systems inside buildings for civil and industrial use, hospitals and hotels.
The pipes' white internal surface, simplify video camera inspections.

Features

- Good soundproofing performance: thanks to its characteristics, the system has a noise level of 17 dB(A) with a flow rate of 2 l/s.
- Absolute guarantee of seal tightness thanks to the (pre-assembled) elastomer seal which does not require the use of any special equipment, glue or solvents.
- The white inner surface facilitates video inspection operations inside the waste piping system.
- The special material mix that makes up the pipes' intermediate layer increases the crushing and the impact resistance of the pipes at low temperatures. The particular characteristics of the material provide a good soundproofing performance, one of the best when compared with products in the same category.
- Extremely fast and easy to install thanks to the light weight of the products.
- Range of diameters from Ø 32 mm to Ø 160 mm and wide choice of special pieces and accessories that allow the construction of any type of system and the connection to waste systems in different materials such as cast iron, PE, PVC, etc.
- The material is not affected by stray currents and is compatible with the majority of chemical substances normally present in waste waters.
- High abrasion resistance.
- Extremely smooth internal surfaces guarantee minimal pressure losses and no deposit formation.
- Pipes are available in various lengths (from 150 mm to 5 m) and by the double socket pipe and the double socket fitting material wastage is avoided.

Pipe structure.



1. **Intermediate layer**
   It's made of a mix of polypropylene and mineral fillers that offers a significant mechanical resistance even at low temperatures.
2. **Push-fit socket with lip seal**
   It guarantees hydraulic tightness and free movement of the pipe in presence of thermal expansion.
   The geometrical characteristics of the socket ensure a fast and easy installation.
3. **External layer**
   It's produced with grey polypropylene and guarantees excellent mechanical protection and resistance to abrasion.
4. **Internal layer**
   The inside of the pipe is made up of an extremely smooth layer of white polypropylene that facilitates video inspection operations and it guarantees resistance to chemical agents.

Technical details

Typical technical details.

Property	Value	Test method
Pipe material	Polypropylene for internal and external layers, mix of polypropylene and mineral fillers for the intermediate layer	-
Fitting material	Polypropylene(1)	-
Seal material	SBR	
Colour	Fittings: Grey RAL 7037. Pipes: Grey RAL 7037 for the external layer, Black for the intermediate layer, White for the internal layer.	-
Diameters	32÷160 mm	-
Application	High and low temperature waste and drainage systems inside buildings and outside buildings fixed onto the wall (application area B) or laid directly in the concrete casting; ventilation of waste systems; gravity rainwater drainage systems.	-
Connections	Connection with push-fit socket with rubber seal.	-
Minimum temperature of use	-10°C	-
Maximum temperature of waste water	+95°C (intermittent) +80°C (continuous)	-
Minimum pressure	Not suitable for drainage systems under negative pressure	-
Maximum pressure	+1.5 bar(2)	-
Composition of waste water	pH 2÷12	-
Soundproofing performance	$L_{SC,A}$=17 dB(A) with flow of 2 l/s, measurement performed on basement test room floor, behind the installation wall with 2 clips per floor	EN 14366
	L_{IN}=20 dB(A) with flow of 2 l/s, measurement performed on basement test room floor, behind the installation wall with 2 clips per floor	DIN 4109
Density at 23°C	pipes: > 940 kg/m^3 (average on thickness) > 1800 kg/m^3 (intermediate layer) fittings: > 900 kg/m^3	UNI EN ISO 1183-2
Elasticity modulus	1650 MPa	ISO 527-2
Tensile strength	≥ 22 MPa	ISO 527-2
Ultimate elongation	≥ 500%	ISO 6259-3
Crystalline melting temperature	≥ 160°C	ISO 11357-3
Linear heat expansion coefficient	0.11 mm/m·K	-
UV resistance	Suitable for use outdoors(3). Suitable to be stored outdoors (for periods not exceeding 18 months).	-
Halogen content	Halogen-free	-
Fire resistance	D-s3,d2	EN 13501-1
Reference construction standard	EN 1451-1	-
Packaging	Pipes in wooden frames with strapping for large diameters, in bundles tied with plastic elements for other diameters, in cardboard boxes for small diameters and reduced lengths. Fittings in cardboard boxes.	-

(1) Fittings are the same of the PP product line.
(2) This product line is suitable for gravity waste systems therefore, the indicated value refers to the maximum pressure that can be applied during system testing at 20°C.
(3) Provided that it's protected from direct exposure to sun rays, for example, using a special protective paint.

Application field

The PP3® pipes and fittings meet the requirements of the EN 1451 Standard and can be used inside buildings intended for residential and industrial use and, in particular, for the following purposes:

- Waste pipes for domestic waste waters (low and high temperature).
- Ventilation pipes connected to the waste pipes previously indicated.
- Rainwater systems within the building structure.

According to the European Standard EN 1451 the Valsir PP3® pipes and fittings are suitable for applications marked with “B”, which are intended to be used inside buildings and outside buildings fixed onto the wall.

Dimensions

The nominal diameters, the nominal wall thickness and relative tolerances of the Valsir polypropylene pipes are indicated in the following table. These values are in compliance with those set by the standards currently in force.

Dimensional characteristics of the pipes.

Nominal diameter DN [mm]	External diameter OD [mm]	Thickness s [mm]	Series S	Application area
30	$32^{+0.3}$	$1.8^{+0.4}$	14/16/20	B
40	$40^{+0.3}$	$1.8^{+0.4}$	14/16/20	B
50	$50^{+0.3}$	$1.8^{+0.4}$	14/16/20	B
70	$75^{+0.4}$	$1.9^{+0.4}$	20	B
90	$90^{+0.4}$	$2.2^{+0.5}$	20	B
100	$110^{+0.4}$	$2.7^{+0.5}$	20	B
125	$125^{+0.4}$	$3.1^{+0.6}$	20	B
150	$160^{+0.5}$	$3.9^{+0.6}$	20	B

Note: The tolerances indicated are specified in the reference standard EN 1451.

Connection systems

Different methods can be used for connecting the pipes and/or fittings in polypropylene:

- Connection with push-fit socket.
- Connection with a sliding sleeve.
- Connection with double socket fitting.

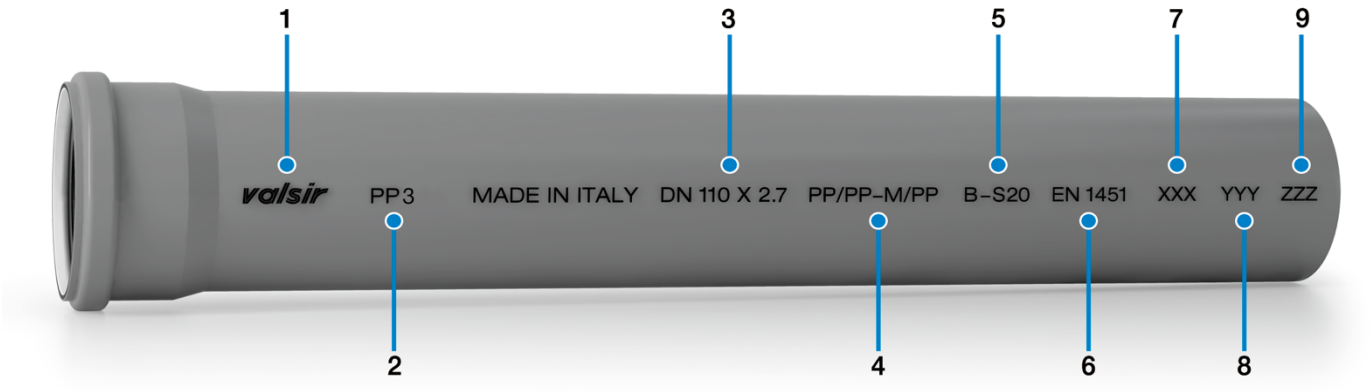
Approvals

The approvals of Valsir PP3® pipes and fittings are available on the website www.valsir.it

The PP3® system, is EPD (Environmental Product Declaration) certified. This document describes environmental impacts of a specific quantity of material or service during the life cycle. The EPD document can be downloaded from the website www.valsir.it in the EPD area.

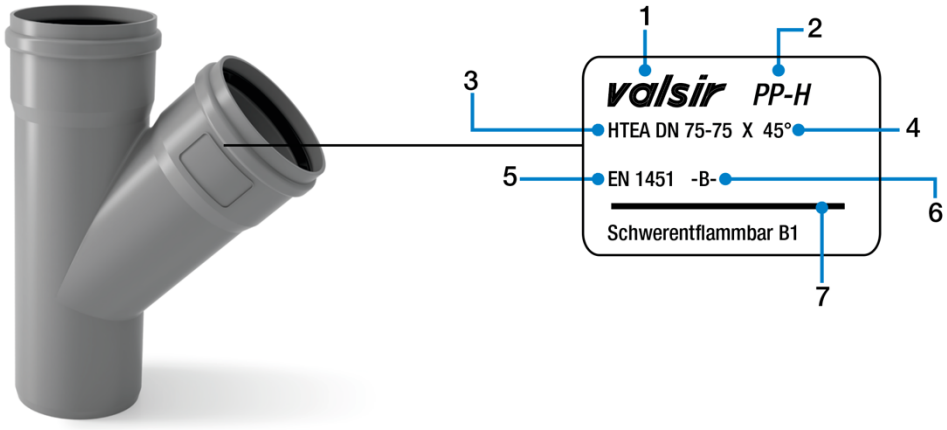
Marking

Pipe marking.



1. Name of manufacturer
2. Brand name (PP3)
3. External diameter and thickness
4. Indication of material (PP/PP-M/PP)
5. Indication of application area (B) and series
6. Reference standard
7. Indication of production plant
8. Indication of production period
9. Product approvals

Fitting marking.



1. Name of manufacturer
2. Indication of material (PP-H)
3. Connection diameters
4. Characteristic angle (for bends and branches)
5. Reference standard
6. Indication of application area (B)
7. Product approvals

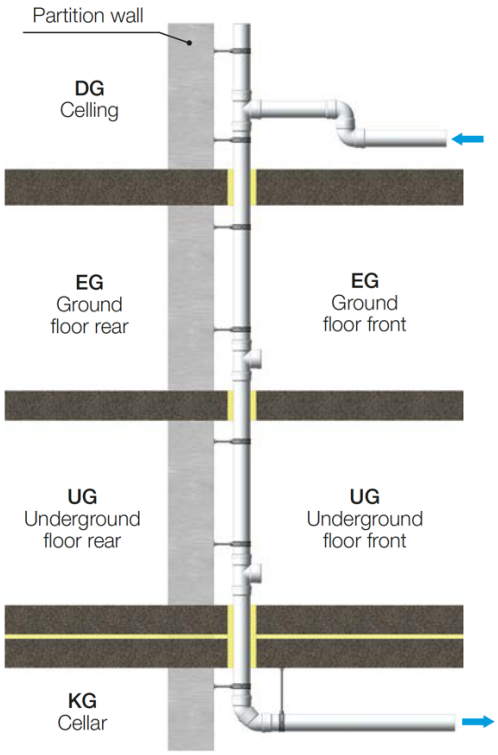
Acoustic performance of waste systems: test methods

The reference standards used for the tests are the UNI EN 14366:2004 and the DIN 4109:1989 (together with DIN 52219:1993) that specify the measurement methods and the results' evaluation.

The test building is located inside the Fraunhofer Institute and it is completely insulated through very thick walls made of the highest quality soundproofing materials. It is a real building of four floors (with internal height of 3050 mm), two of which, shown in the figure with EG and UG, are the reference floors for measurements divided by a wall made of concrete, with a weight of 220 kg/m^2 according to the Standard DIN 4109 (250 kg/m^2 for European standard EN 14366), to which the 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 is free from any installation and it is affected by the noise vibrations transferred to the partition wall; the back rooms have a volume of 70.4 m^3 (surface area of about 23 m^2) while the front rooms are 52.6 m^3 (surface area of about 17 m^2).

Layout of test system.



A pumping station with a precision of 5% ensures a continuous waste flow and supplies different levels of flow in relation to the internal diameter of the pipe, as can be seen in Table.
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 ≤ ID < 100	100 ≤ ID < 125	125 ≤ ID < 150
Measurement flows [l/s]	0.5 - 1	0.5 - 1 - 2 - 4	0.5 - 1 - 2 - 4 - 8

The results

The tests were carried out both with 2 clips and with 1 clip per floor as they represent the typical installations in residential buildings. Consider that the values obtained were rounded up to whole numbers as requested by the reference standards.

Levels of sound pressure measured behind the installation wall for the Valsir PP3® 110x2.7 pipe, measurements performed and formulated by the Fraunhofer Institute of Stuttgart (Germany).

Test pipes: Valsir PP3®						
Test conditions	**Measurement floor**	**Flow rate of water**				**Reference standard**
		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	<10 dB(A)	13 dB(A)	17 dB(A)	23 dB(A)	EN 14366
Index L_{IN} measured behind the installation wall, with 2 clips per floor, pipe diameter OD 110 mm	EG UG	10 dB(A) 12 dB(A)	14 dB(A) 16 dB(A)	17 dB(A) 20 dB(A)	23 dB(A) 26 dB(A)	DIN 4109
Index L_{IN} measured behind the installation wall, with 1 clip per floor, pipe diameter OD 110 mm	EG UG	10 dB(A) 11 dB(A)	12 dB(A) 14 dB(A)	16 dB(A) 18 dB(A)	22 dB(A) 24 dB(A)	DIN 4109