



TRIPLE-LAYER, SELF-EXTINGUISHING, SOUNDPROOFING AND UV-RESISTANT PUSH-FIT SYSTEM FOR INSTALLATION INSIDE BUILDINGS



The product

The Valsir Blackfire® system 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 pipes are composed of three layers of material, that, when combined, give them exceptional mechanical properties at low temperatures as well as excellent soundproofing.

Characteristics

- Excellent soundproofing performance; thanks to its characteristics, the system has a noise level of 13 dB(A) with a flow rate of 4 l/s and lower than 10 dB(A) with a flow rate of 2 l/s.
- Excellent firefighting performance, resulting in a class B1 rating according to standard DIN 4102-1.
- Pipes and fittings with carbon black and other additives to make the system UV-resistant.
- 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.
- Extreme versatility and ease of installation thanks to the light weight of the products.
- Wide range of diameters from Ø 32 mm to Ø 160 mm and accessories for connection to existing drainage networks, also made with different materials.
- High impact resistance also at low temperatures thanks to the structure made up of three layers of material joined together.
- High chemical resistance also at high temperature, not subject to stray currents.
- High resistance to abrasion.
- Extremely smooth internal surfaces ensure reduced pressure losses and prevent the formation of deposits.
- Pipes are available in different lengths (from 150 mm to 3 m) and by using the double socket pipe and the double socket fitting material wastage is avoided.



1. **Intermediate layer**

Obtained with a mix of polypropylene and mineral fillers that guarantees elevated mechanical resistance and excellent soundproofing performance.

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. **Exterior layer**

Produced in polypropylene, it guarantees high impact resistance. The presence of carbon black ensures a high resistance to UV rays.

4. **Interior layer**

Realized in polypropylene, it's characterized by an extremely smooth internal surface and a high resistance to chemical agents.

Technical details

Typical technical details.

| Property | Value | Test method |
|------------------------------------|---|-------------------|
| Pipe material | Polypropylene for internal and external layers, mixture of polypropylene and mineral fillers for intermediate layer | - |
| Fitting material | Polypropylene + mineral fillers | - |
| Seal material | SBR | - |
| Colour | Fittings: black. Pipes: black for the intermediate and external layers, 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 | Push-fit socket connection with rubber seal. | - |
| Minimum temperature of use | -10°C | - |
| Maximum temperature of waste water | +95°C (intermittent) +80°C (continuous) | - |
| Minimum pressure | -800 mbar ⁽¹⁾ | - |
| Maximum pressure | +1.5 bar ⁽²⁾ | - |
| Composition of waste water | pH 2÷12 | - |
| Soundproofing performance | L _{a,A} =13 dB(A) with flow of 4 l/s and <10 dB(A) with flow of 2 l/s, measurements performed on basement test room floor, behind the installation wall with 2 clips per floor | EN 14366 |
| | L _{AFeq,n} =17 dB(A) with flow of 4 l/s and 12 dB(A) with flow of 2 l/s, measurements performed on basement test room floor, behind the installation wall with 2 clips per floor | DIN 4109 |
| Density at 23°C | pipes: ~ 1100 kg/m ³ fittings: ~ 1000 kg/m ³ | UNI EN ISO 1183-2 |
| Elasticity modulus | 1500 MPa | ISO 527-2 |
| Tensile strength | ≥ 20 MPa | ISO 527-2 |
| Ultimate elongation | ≥ 50% | ISO 6259-3 |
| Crystalline melting temperature | ≥ 160°C | ISO 11357-3 |
| Linear heat expansion coefficient | 0.08 mm/m·K | - |
| UV resistance | Suitable for use outdoors thanks to the presence of Carbon Black and others components. | - |
| Halogen content | Halogen-free | - |
| Fire resistance | B1 | DIN 4102-1 |
| Reference construction standard | EN 1451-1 - AS7671:2003 | - |
| 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) The system is suitable for the creation of central vacuum systems. The values indicated refer to 20°C.

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

Application field

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

Pipe dimensional characteristics.

| 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} | 2.3 ^{+0.5} | 16 | B |
| 90 | 90 ^{+0.4} | 2.8 ^{+0.5} | 16 | B |
| 100 | 110 ^{+0.4} | 3.4 ^{+0.6} | 16 | B |
| 125 | 125 ^{+0.4} | 3.9 ^{+0.6} | 16 | B |
| 150 | 160 ^{+0.5} | 4.9 ^{+0.7} | 16 | 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:

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

Approvals

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

The Blackfire® 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.

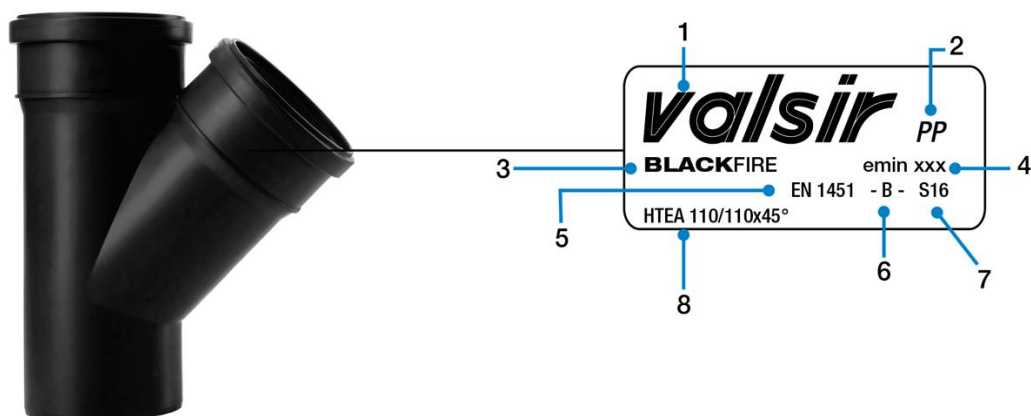
Marking

Pipe marking.



1. Name of manufacturer
2. Brand name (Blackfire)
3. External diameter, lenght and thickness
4. Indication of production plant
5. Indication of material (PP-ML)
6. Indication of application area
7. Reference standard and serie

Fitting marking.



1. Name of manufacturer
2. Indication of material (PP)
3. Brand name (Blackfire)
4. Minimum thickness EN 1451 standard
5. Reference standard
6. Indication of application area (B)
7. Fitting serie
8. Connection diameters

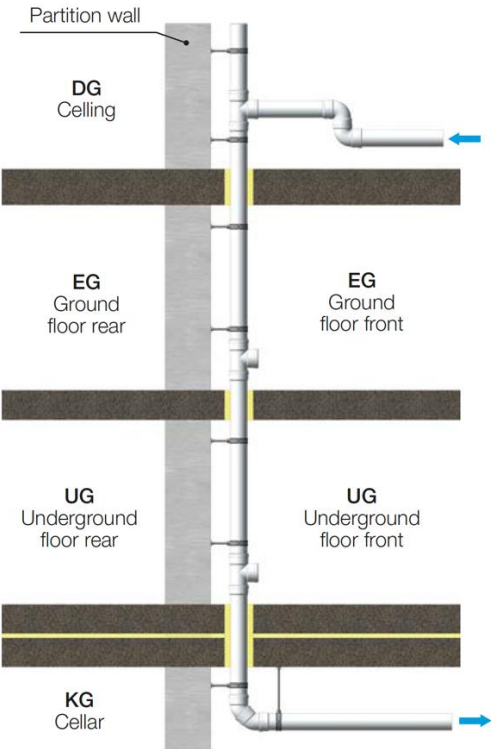
Acoustic performance of waste systems: test methods

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/m² according to the Standard DIN 4109 (250 kg/m² 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 m³ (surface area of about 23 m²) while the front rooms are 52.6 m³ (surface area of about 17 m²).

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 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 Blackfire® 110x3.4 pipe, measurements performed and formulated by the Fraunhofer Institute of Stuttgart (Germany).

| Test pipes: Valsir Blackfire® | | | | | | |
|---|-------------------|--------------------|-----------|----------|----------|--------------------|
| 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 $L_{a,A}$ measured behind the installation wall, with 2 clips per floor, pipe diameter OD 110 mm | UG | <10 dB(A) | <10 dB(A) | <10dB(A) | 13 dB(A) | EN 14366 |
| Index $L_{AFeq,n}$ measured behind the installation wall, with 2 clips per floor, pipe diameter OD 110 mm | UG | <10 dB(A) | <10 dB(A) | 12 dB(A) | 17 dB(A) | DIN 4109 |