



DESIGN & INSTALLATION GUIDE



dBlue
Acoustic
Soil





dBlue Acoustic Soil

A purpose-designed sound reducing drainage system that offers outstanding sound insulation properties.

Used in conjunction with the acoustic pipe brackets, the dBlue acoustic soil system is designed to reduce noise and acoustic vibrations to a level of 10dB at 2l/s*. Suitable for use in multi-occupancy applications as well as hospitals, hotels and other commercial applications, where reduced noise levels are preferred.



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Key

PVCu = Poly vinyl chloride un-plasticised
PP = Polypropylene

INNOVATION
& EXPERTISE

Acoustic soil – dBlue



dBlue acoustic soil range with a layered pipe, provides quick, hygienic removal of sanitary waste water.

Used in conjunction with the acoustic pipe clips, the acoustic system is designed to reduce noise and acoustic vibrations to a level of 10dB at 2 l/s* discharge rate. It is also lightweight, resistant to temperature change and is jointed using the push-fit ring seal method.

Features and benefits

- Light weight
- Easy to handle on site
- 10dB at 2 l/s discharge rate, when using 110mm Phonoklip® bracket
- Secure push-fit jointing system
- Quick and easy to install
- Provides quick and hygienic removal of sanitary waste water
- Dramatically reduce the sound of waste water
- Compatible with the PVCu Soil and Waste system for branch connection
- High impact and temperature resistant

Key Product Information

- Size Range: 110mm and 160mm (additional sizes are available)
- Temperature Rating: 95°C (Short term)

Typical Applications

Sound attenuated drainage systems in:

- Apartments
- Hotels
- Libraries
- Hospitals
- Public buildings
- Restaurants

PVCu soil systems

The PVCu soil system is available in 110mm solvent weld option incorporating socketed and plain ended pipe.

110mm pipe support components have been designed specifically to support horizontal or vertical suspended PVCu pipework.

Pipes and fittings are also suitable for use as internal and external rainwater pipes to drain flat roofs and metal gutter systems on commercial and industrial buildings.



- Solvent weld jointing option
- Quick and easy installation saving time and money
- All collar bosses are individually pressure tested to ensure joint integrity
- Hole-saw locator on all bosses for ease of installation



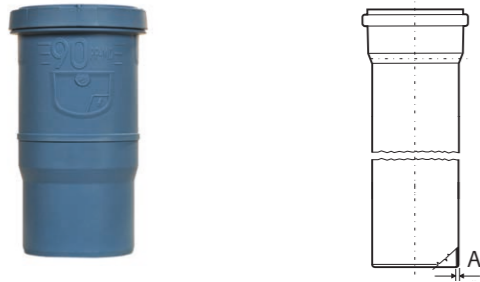
HDPE soil - Akatherm

The HDPE soil range is certified to BS EN 1519: 2000 (licence number KM 545820) and offers an alternative solution to cast iron. The combination of the excellent material properties of HDPE with homogenous welded joints provide greater installation flexibility with a range of jointing options.

It is particularly suited for commercial applications or where a product with high impact or abrasion resistance is required, such as hospitals, hotels, schools, as well as residential buildings. HDPE will also cope with temperature variations of -40°C to 100°C making it ideal for external as well as internal installations.



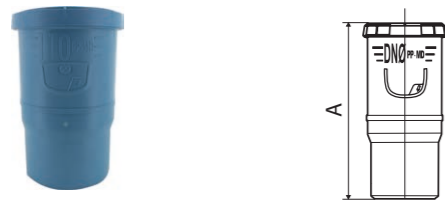
PIPE



| Size mm | Code | Length | A | Qty |
|---------|--------------------------|--------|-----|-----|
| 110 | PPA-110-034-300-D | 3000 | 3.4 | 10 |
| 160 | PPA-160-049-300-D | 3000 | 4.9 | 28 |

Socketed pipe

SHORT PIPE SOCKET



| Size mm | Code | A | Qty |
|---------|------------------------|-----|-----|
| 110 | VDK-110-000-00D | 201 | 6 |

SLIP COUPLING



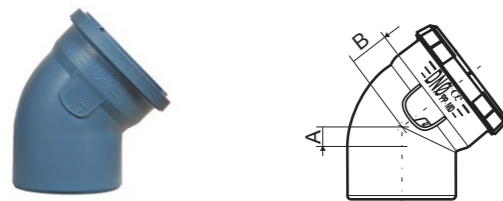
| Size mm | Code | A | Qty |
|---------|------------------------|-----|-----|
| 110 | VMP-110-000-00D | 116 | 6 |
| 160 | VMP-160-000-00D | 140 | 6 |

DOUBLE SOCKET COUPLING



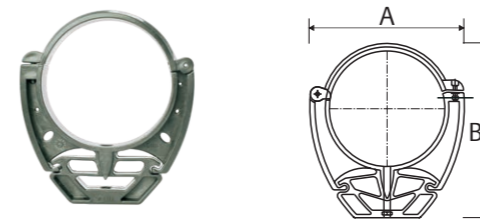
| Size mm | Code | A | Qty |
|---------|------------------------|-----|-----|
| 110 | VMD-110-000-00D | 116 | 6 |
| 160 | VMD-160-000-00D | 140 | 6 |

SHORT RADIUS BEND



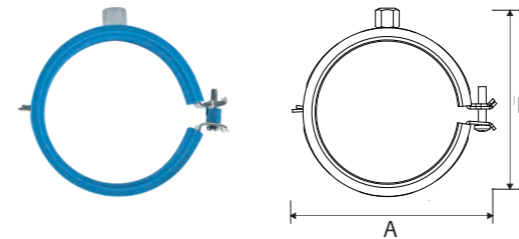
| Size mm | Code | Angle | A | B | Qty |
|---------|------------------------|-------|----|----|-----|
| 110 | VKL-110-000-15D | 15° | 14 | 18 | 8 |
| 110 | VKL-110-000-30D | 30° | 20 | 22 | 8 |
| 110 | VKL-110-000-45D | 45° | 25 | 35 | 14 |
| 160 | VKL-160-000-45D | 45° | 38 | 60 | 6 |
| 110 | VKL-110-000-67D | 65.5° | 45 | 44 | 14 |
| 110 | VKL-110-000-90D | 90° | 61 | 75 | 14 |
| 160 | VKL-160-000-90D | 90° | 99 | 98 | 4 |

PHONOKLIP® BRACKET - ANCHOR/GUIDE



| Size mm | Code | A | B | THREAD | Qty |
|---------|------------------------|-----|-----|--------|-----|
| 110 | POB-PHO-110-000 | 149 | 168 | M8 | 10 |
| 160 | POB-PHO-160-000 | 213 | 232 | M10 | 10 |

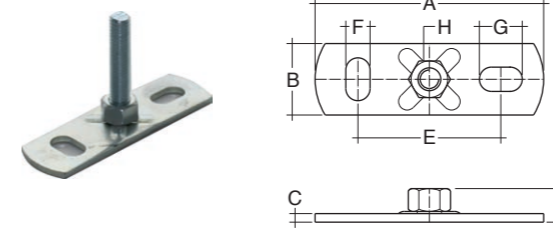
BRACKET - ANCHOR/GUIDE



| Size mm | Code | A | B | THREAD | Qty |
|---------|------------------------|-----|-----|--------|-----|
| 110 | POB-STL-110-000 | 176 | 158 | M10 | 10 |
| 160 | POB-STL-160-000 | 248 | 239 | M10 | 10 |

Rubber lined.

BACKPLATES

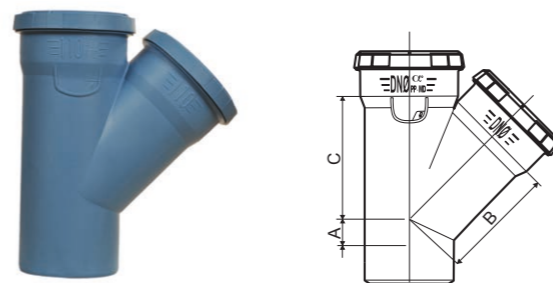


| Size mm | Code | A | B | C | D | E | F | G | H | Qty |
|---------|---------------|----|----|---|----|----|-----|----|-----|-----|
| M8 | BPTM8 | 80 | 25 | 3 | 8 | 50 | 8.5 | 15 | M8 | 10 |
| M10 | BPTM10 | 80 | 25 | 3 | 10 | 50 | 8.5 | 15 | M10 | 10 |

Includes thread.

BZP - recommended for internal use only.

EQUAL BRANCH

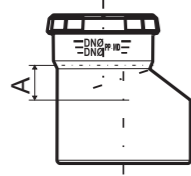


| Size mm | Code | Angle | A | B | C | Qty |
|---------|------------------------|-------|----|-----|-----|-----|
| 110/110 | VTR-110-110-45D | 45° | 29 | 140 | 140 | 7 |
| 110/110 | VTR-110-110-67D | 67.5° | 45 | 94 | 94 | 8 |
| 160/110 | VTR-160-110-45D | 45° | 5 | 184 | 190 | 5 |
| 160/160 | VTR-160-160-45D | 45° | 45 | 208 | 208 | 2 |

**Additional sizes
are available**

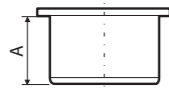
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ECCENTRIC REDUCERS



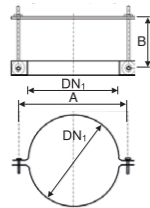
| Size mm | Code | A | Qty |
|---------|------------------------|----|-----|
| 160/110 | VRD-160-110-00D | 35 | 15 |

SOCKET PLUG



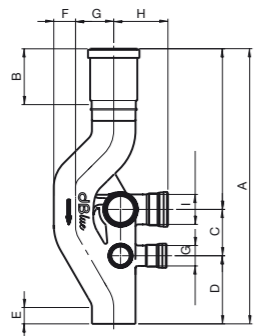
| Size mm | Code | A | Qty |
|---------|------------------------|----|-----|
| 110 | VKK-110-000-00D | 37 | 20 |
| 160 | VKK-160-000-00D | 40 | 34 |

SOCKET PLUG HOLDER



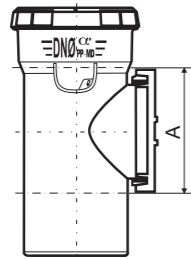
| Size mm | Code | A | B | Qty |
|---------|-------------------------|-----|----|-----|
| 110 | VCPL-KIE-STL-110 | 150 | 40 | 1 |
| 160 | VCPL-KIE-STL-160 | 190 | 50 | 1 |

AKAVENT AERATOR



| Size mm | Code | A | B | C | D | E | F | G | H | I | J | Qty |
|---------|-------------------------|------|-----|-----|-----|----|----|-----|-----|-----|----|-----|
| 110 | VVEN-110-110-75D | 956 | 256 | 170 | 240 | 60 | 55 | 130 | 159 | 110 | 75 | 1 |
| 160 | VVEN-160-110-75D | 1010 | 256 | 170 | 250 | 60 | 80 | 140 | 184 | 110 | 75 | 1 |

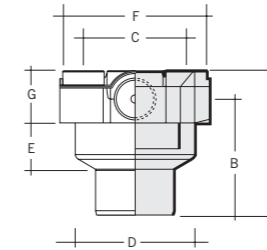
ACCESS PIPE



| Size mm | Code | A | Qty |
|---------|------------------------|-----|-----|
| 110 | VCZ-110-000-00D | 131 | 6 |
| 160 | VCZ-160-000-00D | 209 | 3 |

The following are PVCu products manufactured using a mineral filler. Most are identified by black snap caps

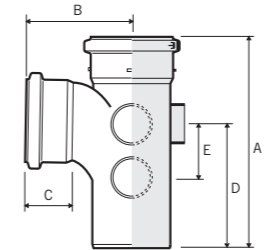
8-WAY COLLAR BOSS



| Size mm | Code | A | B | C | D | E | F | G | Qty |
|---------|----------------|-----|-----|-----|-----|----|-----|----|-----|
| 110 | SCB41BL | 195 | 157 | 140 | 195 | 61 | 204 | 70 | 1 |

Solvent socket/spigot

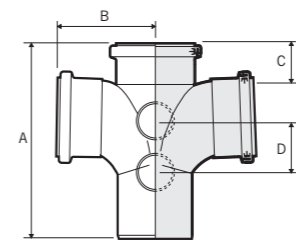
BRANCH



| Size mm | Code | A | B | C | D | E | Angle | Qty |
|---------|----------------|-----|-----|----|-----|----|-------|-----|
| 110 | SY405BL | 287 | 143 | 60 | 175 | 76 | 87.5° | 4 |
| 110 | SY401BL | 299 | 150 | 60 | 175 | | 87.5° | 4 |

Push-fit sockets/spigot
SY405BL - 5 bosses. SY401BL - no bosses.

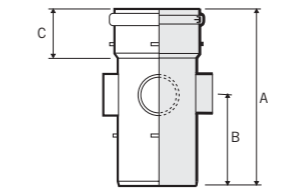
DOUBLE BRANCH



| Size mm | Code | A | B | C | D | Angle | Qty |
|---------|----------------|-----|-----|----|----|-------|-----|
| 110 | SY404BL | 288 | 141 | 54 | 76 | 87.5° | 4 |

Push-fit sockets/spigot. 2 boss/access upstands.

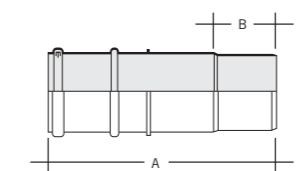
BOSS PIPE



| Size mm | Code | A | B | C | Angle | Qty |
|---------|---------------|-----|-----|----|-------|-----|
| 110 | SW40BL | 244 | 123 | 70 | 90° | 4 |

Push-fit sockets/spigot. 4 boss upstands.

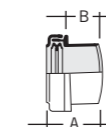
STRAIGHT COUPLING



Triple socket

| Size mm | Code | A | B | Qty |
|---------|----------------|-----|----|-----|
| 110 | SE402BL | 311 | 82 | 4 |

BOSS CONNECTOR



| Size mm | Code | A | B | Qty |
|---------|-----------------|----|----|-----|
| 32 | SA411XBL | 43 | 21 | 50 |
| 40 | SA421XBL | 43 | 21 | 40 |
| 50 | SA420XBL | 66 | 45 | 40 |

Available in blue only.

For connection to PVC waste systems.

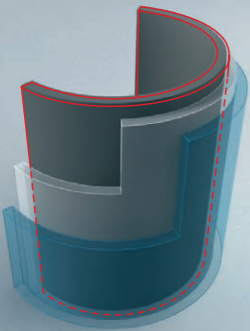
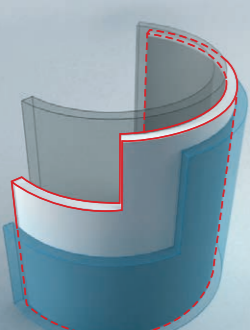
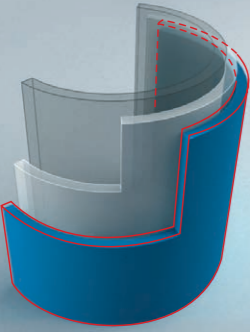
Additional sizes are available

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A special material formula was developed for the dBlue system combining plastic and minerals (mineral fillers), which enabled enhanced acoustic and mechanical characteristics. Detailed chemical tests on a selection of raw materials making up the triple-layer dBlue system material formulation were conducted. Aside from the safe and fast discharge of sanitary waste water, dBlue reduces noise generated by the flow of waste water in pipework. The dBlue system is resistant to hot waste water flow and can also be installed at extremely low temperatures in winter. The pipe has been manufactured in three colours, to distinguish the different layers.

Triple-layer pipe structure

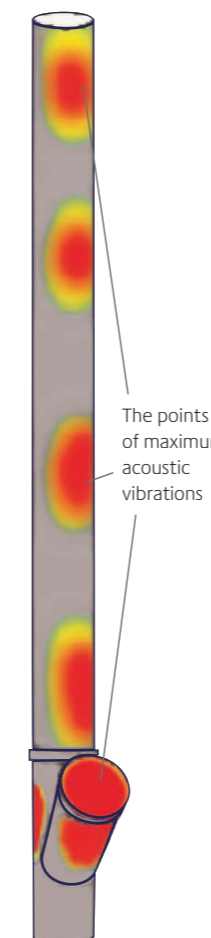
The most modern method of triple-layer, PP pipe co-extrusion was used in the production of the dBlue system. This method means that the propagation of noise generated by waste water flowing inside pipework is severely limited by the nature of the pipe construction. Each of the three layers making up the dBlue system has an individual function

| | |
|---|---|
|  | <p>Internal layer</p> <ul style="list-style-type: none"> • material: PP-B polypropylene with flame retardant • colour grey • resistant to high temperature +90°C [+95°C – short term] • high chemical resistance • smooth surface |
|  | <p>Middle layer</p> <ul style="list-style-type: none"> • material: PP-H modified polypropylene • colour white • additionally reinforced with minerals • noise reduction • high stiffness |
|  | <p>External layer</p> <ul style="list-style-type: none"> • material: PP-B polypropylene • colour blue • resistance to external tensions • resistance to atmospheric factors • smooth surface |

Every object in motion makes noise, transmitting its vibrations in the form of pressure or negative pressure waves, to the surrounding air. There are two types of noise in soil and waste systems:

Airborne noise – coming from pipelines, generated by waste water flowing inside. In this case, a soundproof soil and waste system should limit the propagation of airborne noise and keep it inside the pipes. This is achieved by using a special material formula (using minerals), a multi-layer pipe structure, the quality of manufacturing and correct installation.

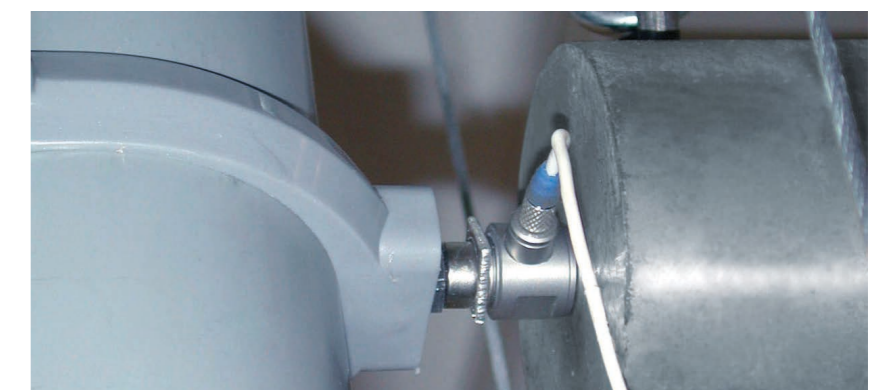
Structureborne noise – coming from pipes and fittings as well as the system of fixing to the building's structure. This sound comes from the noise inside the system, which being limited by pipes and fittings makes them vibrate (acoustic resonance). The resonance is transmitted through a system of pipe brackets to the building's structure and heard in the neighbouring rooms as an irritating acoustic wave. In this case it is important to design the system of fixing pipes and fittings to the building's structure in such a way that the transmission of the acoustic resonance to its walls is reduced to the minimum.



Vibrations and acoustic bridge

Numerous tests were conducted in Aliaxis R&D laboratories to confirm the above mentioned theories. The tests helped to determine the points where maximum acoustic vibrations are generated on the pipe. As shown, the main area of their generation is the pipe and the branch which further transmits acoustic vibrations to the soil stack. The test confirmed that the type and location of pipe brackets as well as the system's design and material formula are the most important factors in the soil and waste system noise reduction. Designing a stand (see image below)

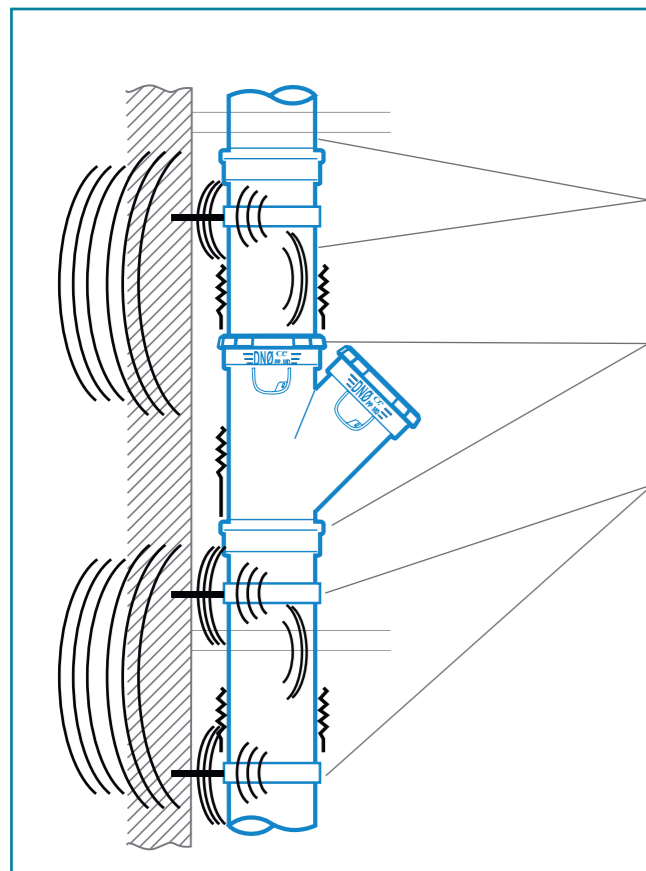
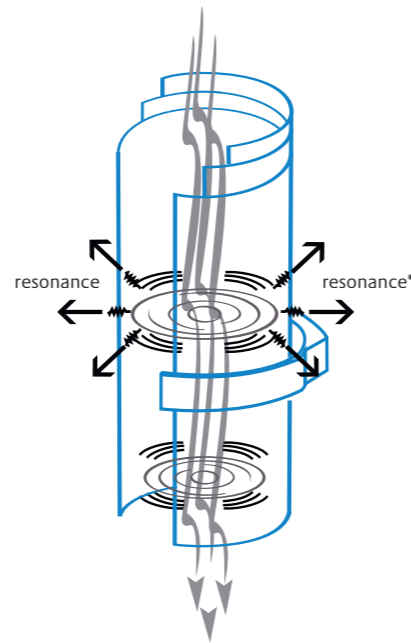
measuring vibrations transmitted by the pipe bracket to the building's structure (acoustic bridge) was the next step. Parallel to work on the structure of the dBlue system, pipe brackets were designed especially for the soundproof soil and waste system. The main objective of the laboratory and prototype work was to develop a system of pipes, fittings and pipe brackets with the weight and wall thickness lower than in the traditional soundproof systems but with the greatest possible reduction of noise inside the system and its transmission to its surroundings.



Reduction of noise inside the pipe and its transmission

The triple layer system puts different material media in the way of the propagating noise, which causes partial absorption of sound waves and their partial reflection inwards and significantly reduces transmission to their surroundings. The absorbed and reflected waves cause acoustic resonance of pipes and fittings. The greater height inside the building, the more dynamically the resonance increases towards the flowing waste water and is transmitted through the fixing system onto the building's structure.

Construction barriers subject to the acoustic resonance transmission cause its transmission to neighbouring rooms in the form of sound waves. The dBlue system's structure along with pipe brackets is responsible for the maximum reduction of this acoustic phenomenon). The acceptable noise level in the mentioned rooms on page 15 is set at the national acoustic safety standards for buildings. These are the places that are particularly protected against noise at the design stage. In contrast, kitchens and bathrooms are the places where pipes are usually located. However, here the noise coming from the soil and waste system is negligible compared with the equipment normally operating in these rooms so it is not subject to limitations to the same degree as the above mentioned rooms designed for frequent stay.



10dB*

Limiting noise propagation

- triple-layer wall structure

Preventing transmission of acoustic vibrations

- between pipes and fittings
- tight socket/gasket connection

Acoustic clips

- acoustic bracket options

*Tests on the reduction of noise coming from soil and waste system carried out in the Institute for Building Physics Fraunhofer Germany, dBlue showed structural borne noise at the level of 10dB at 2l/s under the test conditions.

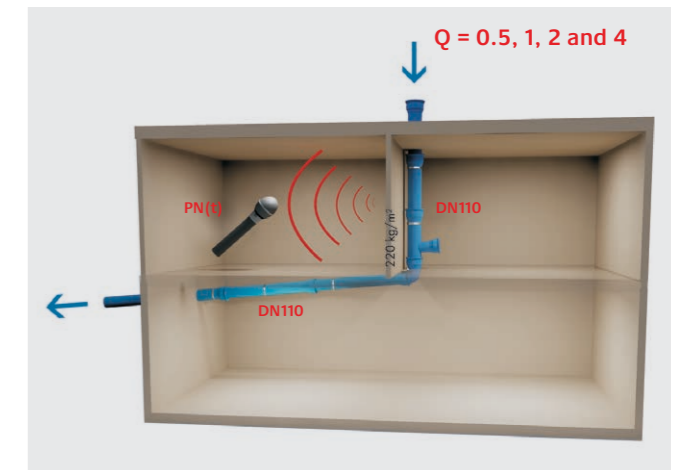
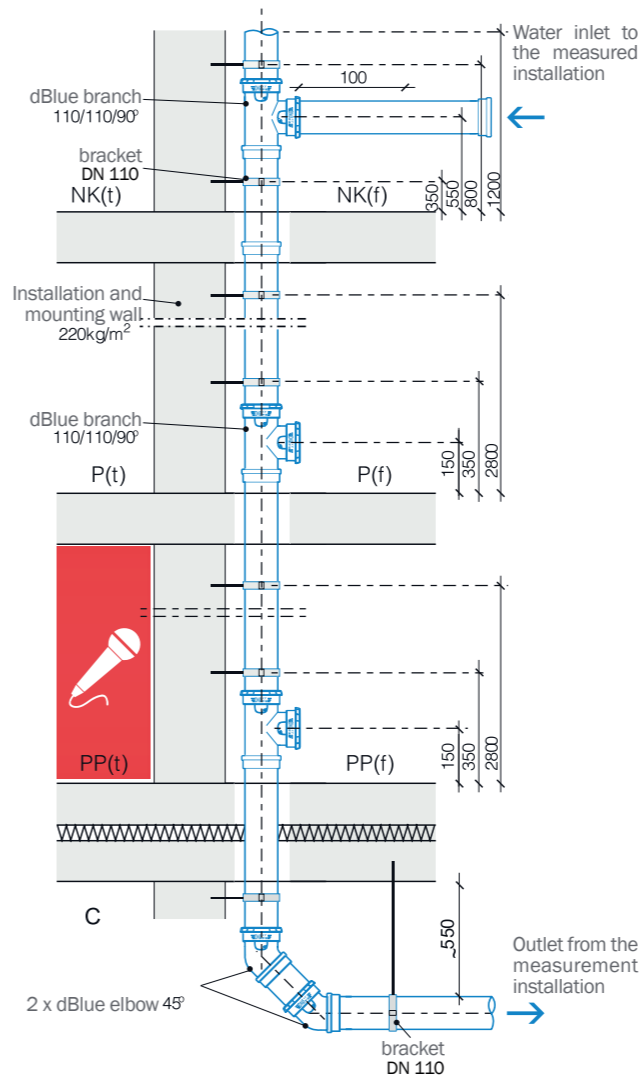
•Structural noise, using 110mm Phonoklip® bracket

dBlue – Fraunhofer test

Test and measurements of noise emitted by the soundproof dBlue system were conducted according to the European standard EN 14366 "Laboratory measurement of noise from waste water installations".

The diagram below presents noise measurement and its methodology inside the dBlue system. The test stand, diameters and types of components used are described in the standard. Water introduced into the system on the NK(f) floor and received on the C floor was the tested medium. Acoustic tests are conducted in rooms PP(t) and PP(f) and the least favourable boundary conditions are assumed in the comparative analysis with other soil and waste systems or other sources of noise. The boundary conditions are as follows:

- measured flow in the soil and waste system $Q = 0.5, 1, 2$ and 4
- pipe diameter DN=110 mm (most frequent diameter)
- measurement taken on the lowest floor, in room PP(t) – room marked red in the diagram; safety standards determine and require the lowest noise levels at this point (room neighbouring the soil stack)
- partition wall – weight: 220 kg/m²



KEY

- NK highest floor
- P ground floor
- PP measurement room
- f front
- t rear
- C basement / garage

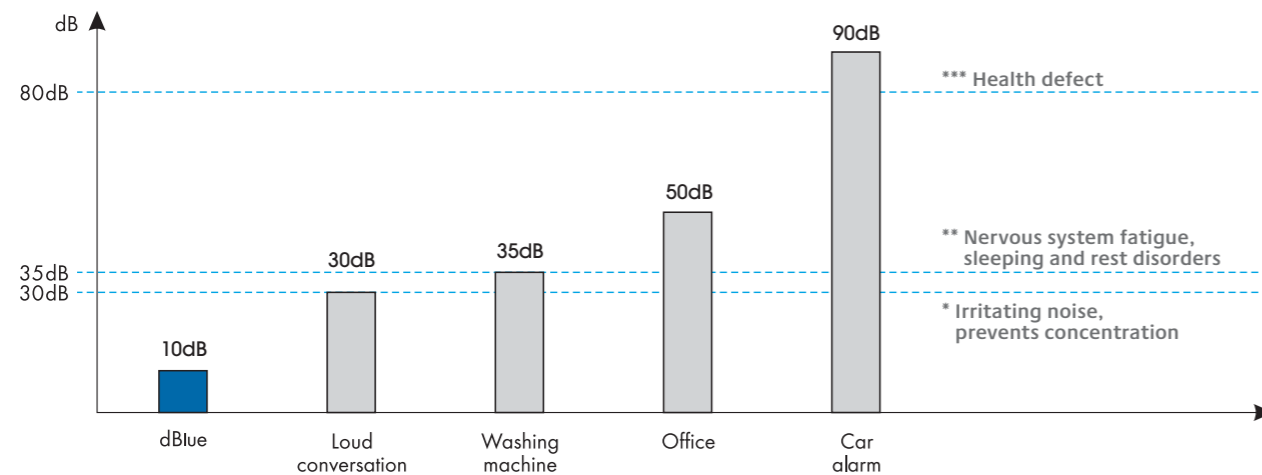
Diagram summarises and visually presents noise measurement for dBlue soil and waste system carried out in the least favourable boundary conditions. Taking into account the assumptions of the above-mentioned test procedure (EN 14366) the maximum levels of noise of dBlue installation were compared for the two most important flow rates.

| | | dBlue Fraunhofer EN 14366 Results | | | |
|--|--------------------|-----------------------------------|-----|-----|-----|
| | | Flow rate [l/s] | | | |
| | | 0.5 | 1.0 | 2.0 | 4.0 |
| | Phonoklip® Bracket | <10 | <10 | 10 | 16 |
| | dBlue Bracket | <10 | 13 | 13 | 16 |

Structureborne noise level $L_{sne, A}$ (dBA)

It is useful to compare the dBlue system's noise reduction and acoustic vibration suppression properties to everyday noise around us. Subject to the test procedure on the level of noise reduction, conducted at Fraunhofer Institute in Germany, according to EN 14366. The dBlue system showed the emitted structural noise level of only 10dB at 2l/s. The diagram below compares the 10dB noise level of dBlue to other noises present in our everyday surroundings.

Everyday noise



Individual noise levels and their effect on human health.

An organ of hearing like the human ear is made to receive not only very quiet noise but also to withstand very loud sounds. As the diagram shows, the difference between the level of noise emitted by the dBlue acoustic soil system and a loud conversation is 20dB. The minimum noise level detected by the human ear is 3dB. This means that an increase in the noise level by 20dB makes a significant and noticeable difference for the ear; the difference later turns into irritating noise. While determining acceptable indoor noise standards for the construction industry it is assumed that the minimum noise reduction that can improve room acoustics and human ear perception is 5dB.

Therefore, the acceptable noise standards for the construction industry described in the next section differ by 5dB in each room.

The Building Regulations Approved Document E (2010) stipulates acoustic requirements of 45dB or less. This Building Regulation applies to any kind of building used as a dwelling, including houses and apartments; and rooms for residential purposes, such as students and nurses accommodation, nursing homes and hotels. It also applies to dwellings that have been created as a result of a conversion or material change of use.

The Scottish Technical Handbook (2016), section 5.1.2 stipulates acoustic requirements of 53dB.

Acceptable noise levels

The acceptable noise level that a human being can be exposed to while performing everyday activities and relaxing is described as "the threshold noise level value". According to the valid regulations, there are two categories of noise tests:

Category I: Noise measured outdoors, i.e. in the neighbouring area, surroundings and open space. According to European Directive No.2002/49/WE, generally speaking, the noise acceptable in a built-up area at daytime is 60dB and at night (between 10.00 pm and 6.00 am), 50dB.

Category II: Noise measured indoors. "Building acoustics. Protection of rooms inside buildings against noise. Acceptable indoor sound level values".

The table below presents several examples of the acceptable sound level in rooms used on a daily basis.

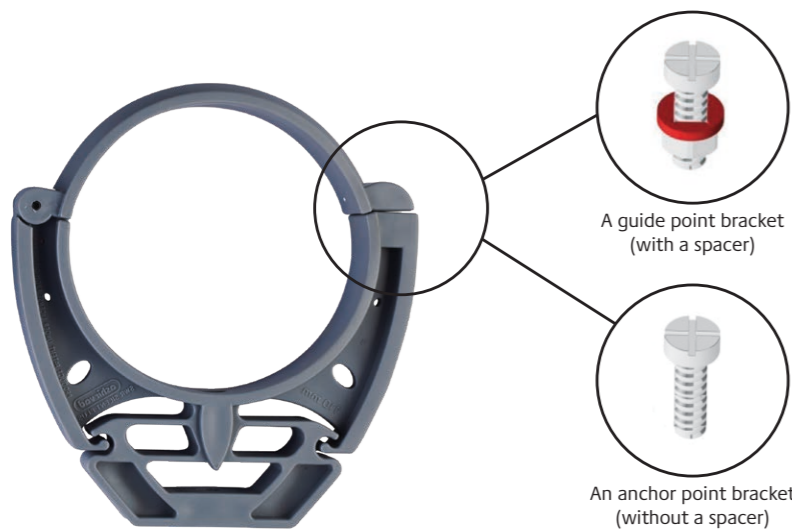
| | Day | Night |
|---|------|-------|
| Rooms designed for mental activities that require intense concentration | 30dB | - |
| Rooms in 3-star or below 3-star hotels | 40dB | 30dB |
| Accommodation in residential buildings, boarding schools, children's homes, care homes, 4 and more star hotels and more | 35dB | 25dB |
| Rooms in Intensive Medical Care Units | 25dB | 25dB |
| Patient's rooms in hospitals and sanatoriums except rooms in Intensive Care Units | 30dB | 25dB |
| Kitchens and sanitary rooms in apartments | 40dB | 40dB |



In order to provide the described reduction of the acoustic bridge and transmission of vibrations coming from the dBlue system, a range of acoustic pipe brackets have been designed with dual fixings, allowing easy conversion from anchor to guide.

The Phonoklip® bracket

A patented acoustic body bracket, encompassing a unique body section which absorbs noise generated from pipework into the building structure. Designed within the Aliaxis R&D laboratory.



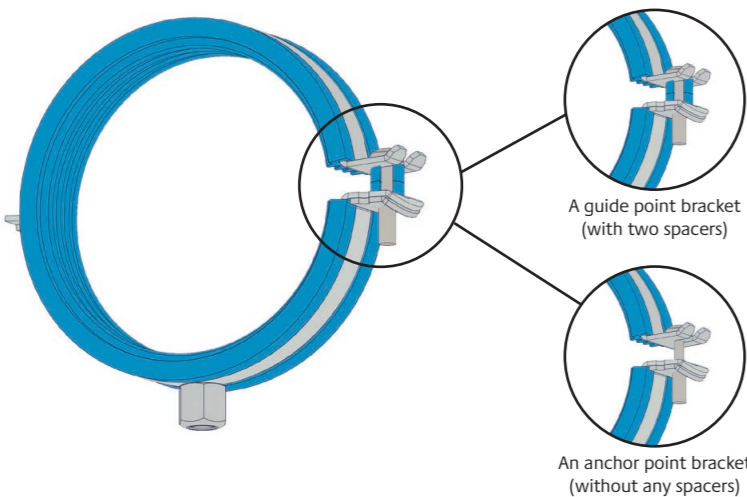
- 110 and 160mm options
- Vibration section (integral)
- M8 thread on 110mm and M10 on 160mm
- Colour: grey



Supplied with a system lock with a locking screw (M-6) and a spacer. In order to obtain a guide point bracket, insert a pipe in a bracket and lock it with a screw and a spacer.

The dBlue bracket

Elastomer inlayed acoustic metal bracket, suppressing pipework noise into the building structure.



- 110 and 160mm options
- Rubber lined
- M-10 thread
- Colour: blue



Supplied with a system lock with a locking screw (M-6) and two spacers. In order to obtain a guide point bracket, insert a pipe in a bracket and lock it with a screw and two spacers.

Case study

St John's student accommodation, Northampton

When the University of Northampton embarked on a multi-million pound project with main contractor Kier Construction, to build a new student accommodation building, it required a plumbing and drainage manufacturer that could provide solutions for a variety of applications. With an extensive product portfolio and an expert technical team, Aliaxis was ideal for this project.

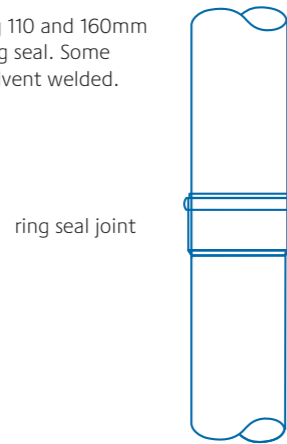
"We chose Aliaxis' competitively priced dBlue, HDPE and PVC Soil and Waste products for this project because of their durable, yet lightweight constructions, which ultimately led to easier handling on site and – going forward – the ability to withstand high daily usage"

Bob DeGennaro, Integral.



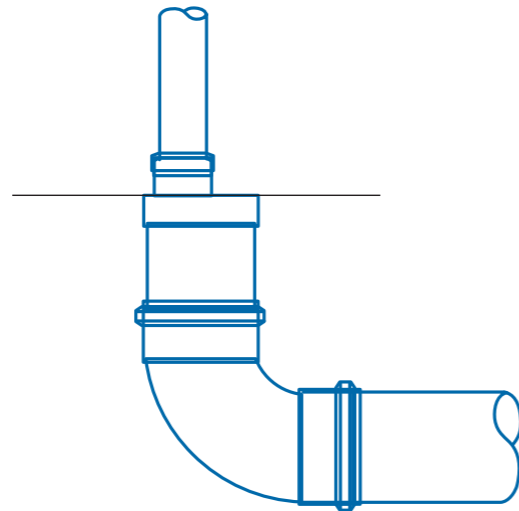
Methods of jointing

The principal method of jointing 110 and 160mm dBlue pipes and fittings is by ring seal. Some components in the range are solvent welded.



Stub waste

This technique is often used to connect isolated ground floor waste appliances such as basins, baths, shower trays and sinks to eliminate exposed pipework or low level ducting. The 110mm unventilated drain is terminated at finished floor level with a reducer and boss adaptor to suit the size of waste from the appliance.

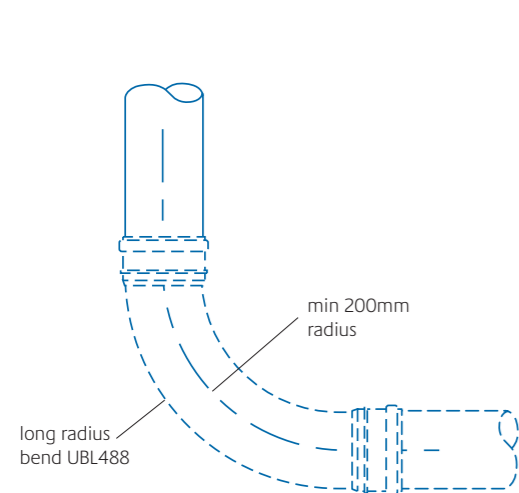


Sanitary pipework design

All sanitary pipework systems should be designed in accordance with BS EN 12056: 2000, Parts 1 to 5.

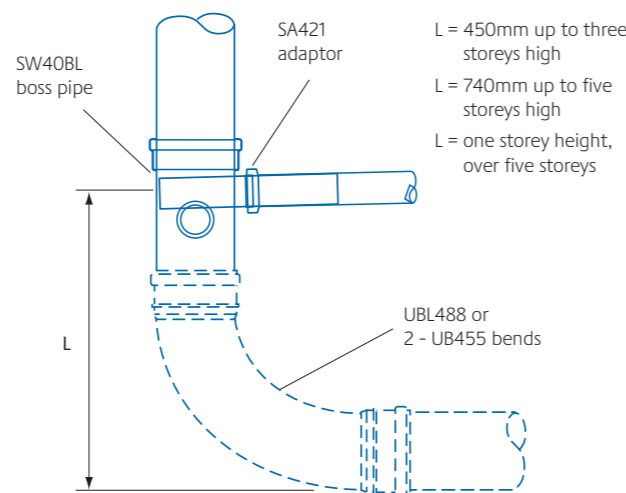
Bends at the base of stacks

Bends at the base of vertical stacks should be of long radius and have a minimum centre line radius of 200mm on a 110mm nominal size stack. Two 45° radius bends may also be used as an alternative to provide the change of direction and connection to the building drain. The same design principle should also be adopted where offsets occur in stacks of one or more storey height.



Branches at the base of stacks

For single dwellings up to three storeys high, the distance between the centre line of the lowest branch connection and the invert of the drain should be at least 450mm. For multi-storey systems up to five storeys high, the minimum distance should be 740mm and for systems higher than five floors no connections are permissible at ground floor level. Where this occurs a separate stub stack should be provided to serve the ground floor or individual appliances should have their own separate connection to the building drain.



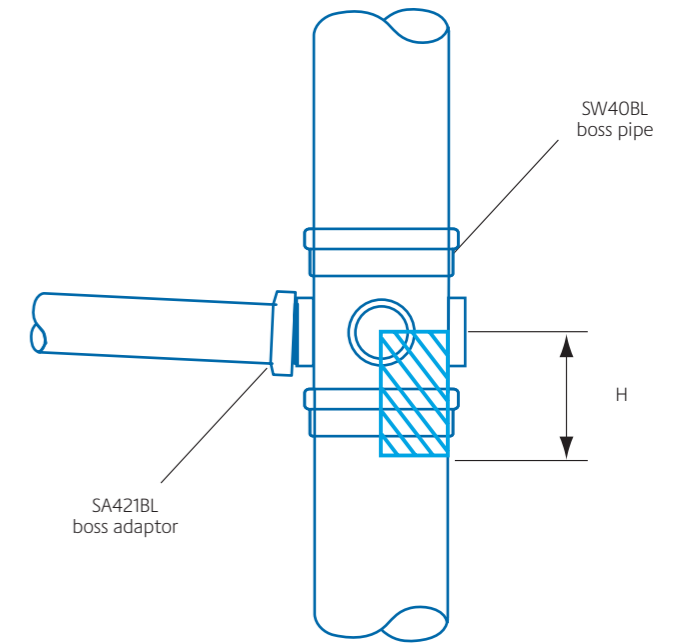
Offsets in stacks

Offsets in the wet portion of a discharge stack should be avoided wherever possible but where they have to be fitted a large radius or two 45° bends should be used to create each change of direction. Offsets in lightly loaded stacks up to three storeys high do not require offset venting but on multi-storey buildings this may be necessary depending on the loading of the stack and the numbers of floors above the offset. The principles previously described for bends and branches at the base of a stack should also be applied.

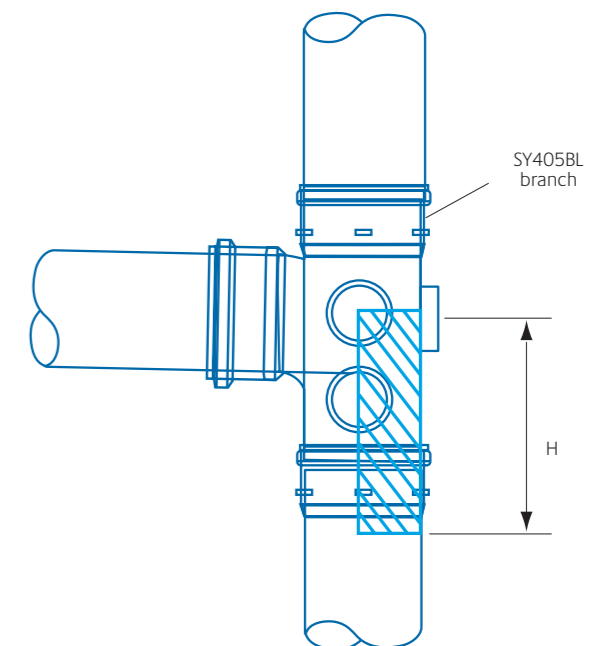
Prevention of cross-flow

Where small diameter branch waste pipes connect to a discharge stack they must be arranged to eliminate the risk of cross-flow from one branch to the other. A branch creates a no entry zone for opposing waste connections, which varies depending on the stack diameter. No connections should be made within the restricted zone although entry is permissible on the centre line of the boundary directly opposite or at right angles.

| Stack size (mm) | Height of zone 'H' (mm) |
|-----------------|-------------------------|
| 110 | 110 |
| 160 | 250 |



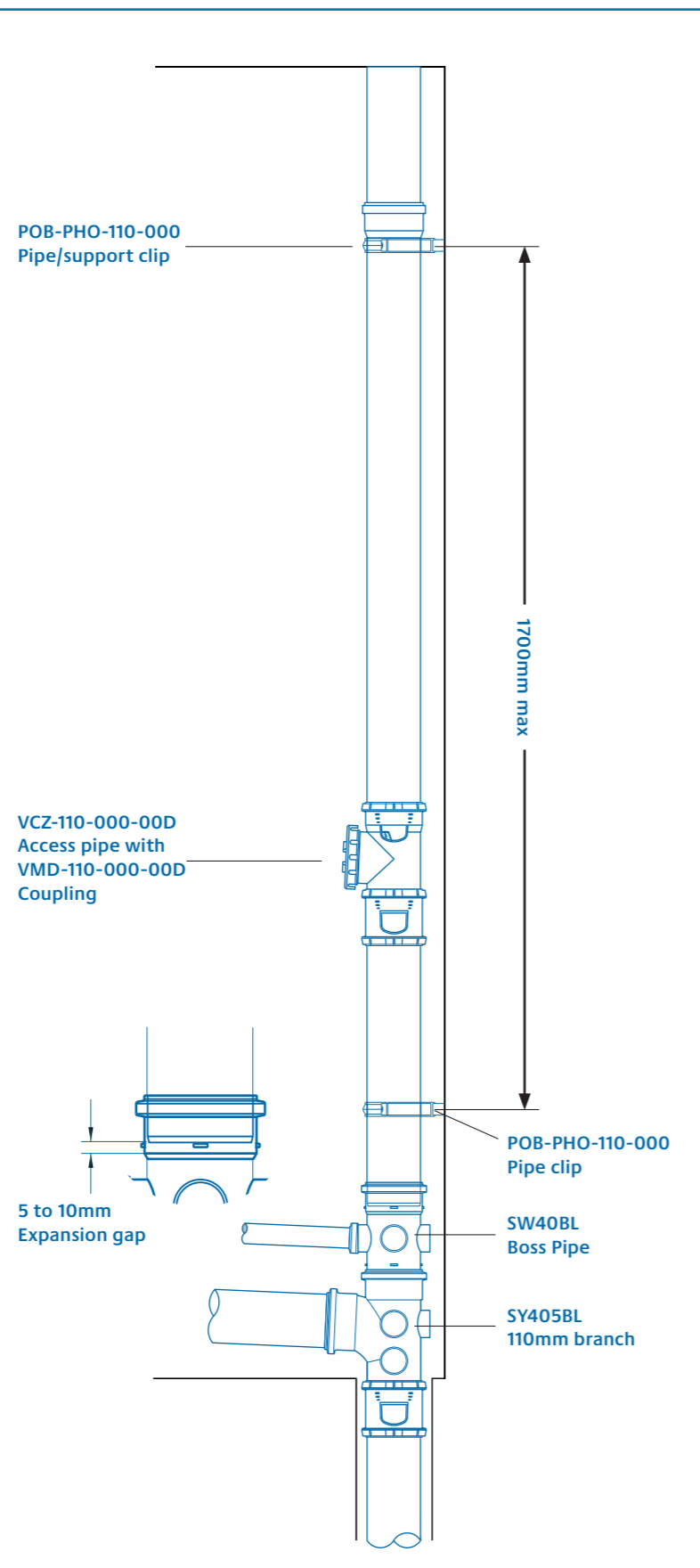
To prevent cross-flow from a large diameter branch to a smaller waste connection, the latter should be made to the stack at or above the centre line of the larger branch, at right angles or at least 200mm below the restricted zone. Entry is permissible on the boundary centre line directly opposite or at right angles.



'H' = 200mm irrespective of stack diameter

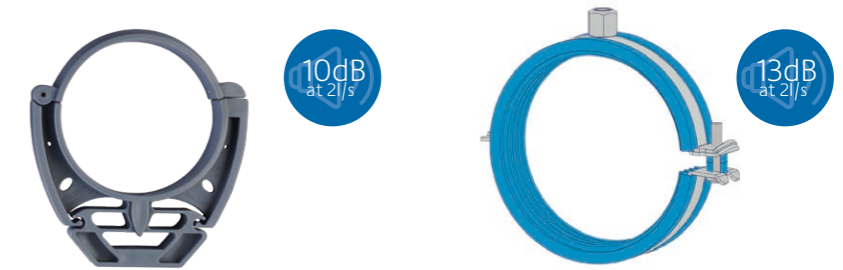
Joining techniques

The ring seal has been successfully employed as the principal method of joining large diameter PVCu pipes and fittings since their introduction over thirty years ago. This particular technique has proved extremely reliable as the joint can accommodate thermal movement that will occur as a result of temperature variations. An expansion gap of between 5-10mm should be allowed within each ring seal socket as each full length of pipe is installed and fixed.



Vertical pipe support

In order to maintain good acoustic properties, the dBlue system should be installed together with specially designed acoustic pipe brackets, details of which can be found on page 16.



Horizontal pipe support

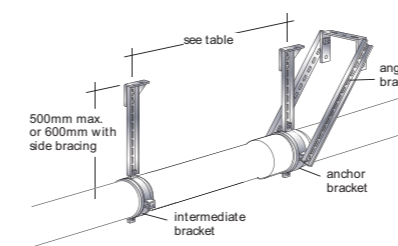
The dBlue pipe support range was developed to meet the specific requirements of suspended sanitary pipework and drainage systems. Manufactured in zinc electro plated mild steel for internal use, the versatile range of components can be assembled to provide a robust, lightweight system suitable for most applications. The system also provides suitable control of expansion and contraction.

The arrangements of brackets and channel supports have been extensively tested and the assembly techniques used have been successfully employed on many domestic and commercial installations. Three different support methods are described and the recommended support centres are shown in the following table for each option.

| PIPE DIAMETER (MM) | HORIZONTAL SUPPORT (M) | VERTICAL SUPPORT (M) |
|--------------------|------------------------|----------------------|
| 110 | 1.00 | 1.70 |
| 160 | 1.20 | 1.70 |

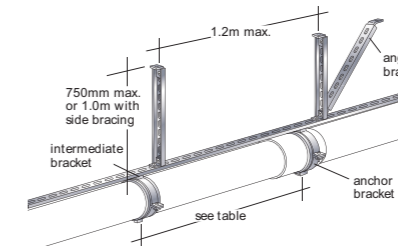
Single support

Recommended for waste or larger diameter pipework fixed within 500mm of the floor soffit.



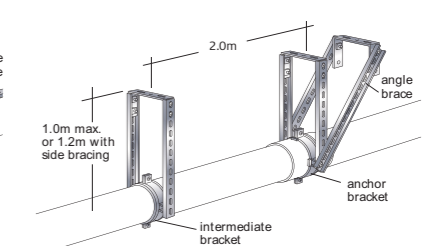
Continuous channel support

Suitable for use where pipework is fitted within 750mm of the floor soffit with structural fixings provided at a maximum of 1.2m centres.



Double support

Developed for use with larger diameter pipework fixed within 1.0m of the floor soffit.



Pipe brackets

The 110 and 160mm two piece pipe brackets are designed to fit round the ring seal socket of a pipe or fitting. Where intermediate support brackets are located, the SC621 PVC barrel clip collar is used as a spacer sleeve between the pipe and bracket.

Angle and side bracing

Angle braces should be provided at 6m centres to prevent lineal and thermal movement. Side bracing may also be necessary on long runs where there are no side connections to eliminate lateral movement.

Vertical pipes

The transition between vertical and horizontal pipework should be achieved using two 45° bends or a single 87.5° long radius bend with a support bracket positioned as close as possible.

Branch connections

All branch connections into horizontal pipework should be made at 45° to ensure the discharge is swept in the direction of flow.

Structural fixings

It is recommended that 6mm rawlbolt or similar proprietary fixings are used to secure base plate and angle cleats to the structure.

Cutting pipes and jointing

Prior to cutting the pipe and jointing it to another pipe or fitting, measure the necessary pipe section allowing for the pipe socket depth.



Cut the pipe using a pipe cutter (Photo 1) or a fine-toothed saw (Photo 2), with particular attention to keeping the angle 90°. Another important factor prior to making the connections is to bevel the pipe end properly, using a chamfering tool or coarse file to provide a 15° bevel on the end of the pipe. (Photos 3 & 4).



| | | |
|---|-----|-----|
| Ø | 110 | 160 |
| b | 4.5 | 6 |

When connecting the pipe with a fitting or the socket of another pipe, push the connected pipe to the insertion depth (Photo 5) and mark a line on the edge of the socket and the connected pipe (Photo 6).



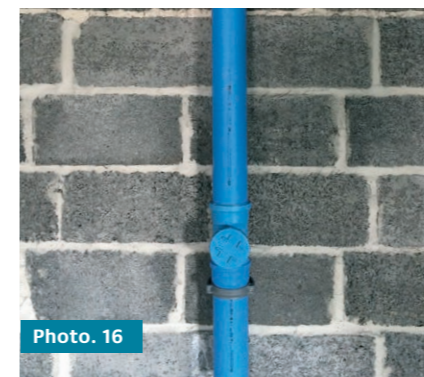
In order to allow for thermal movement, an expansion gap of between 5-10mm should be allowed within ring seal joints as each full length of pipe is installed and bracketed accordingly to ensure the gap is maintained (Photo 7). Using a level (Photo 8), determine the length of the dBlue soil stack. On the run line, measure the points (Photo 9) where the pipe brackets will be fixed.



Next, drill holes applicable for the diameter of fixing (Photo 10) on the pipe line. Affix a drop in anchor & thread and mount the pipe bracket by screwing it clockwise, so that the bracket is firm against structure. (Photo 11 & 12).



In the final stage, put the pipe or fitting inside the pipe bracket under socket and connect the open pipe bracket (Photo 15).



Final installation using Phonoklip® bracket and dBlue bracket. (Photo 16 and 17).

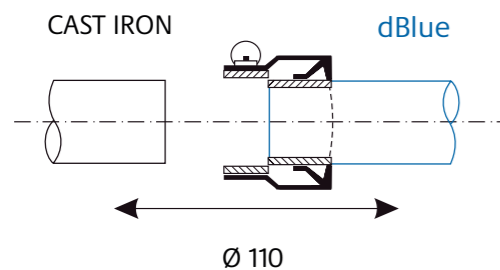
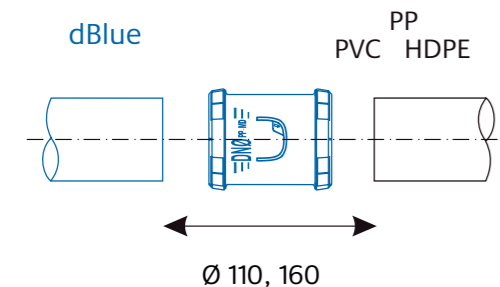
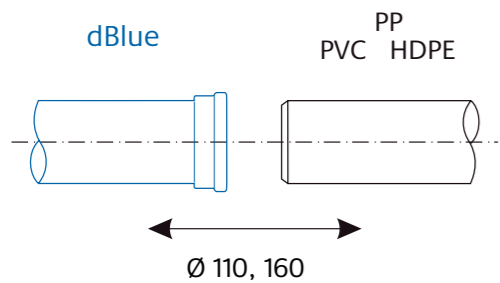
NOTE:
If using a backplate or channel system, bracket must be also threaded firm against the backplate or channelling.

NOTE: Prior to making socket connections, lubricate the pipe end and the seal in the socket to facilitate inserting the spigot into the socket.

Installation

Full dimensional standardisation

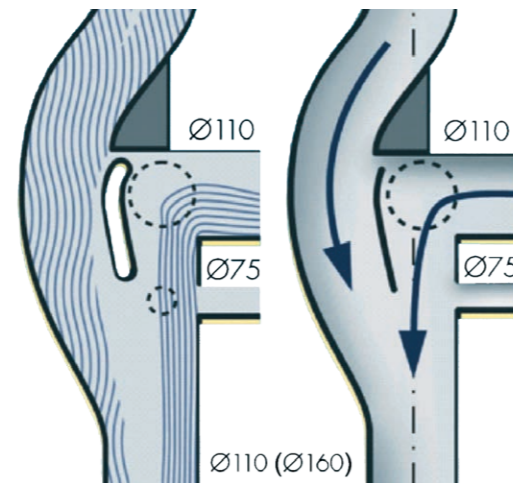
With a view to facilitating installation works and connecting the dBlue system to other soil and waste systems as well as connecting those systems to the dBlue soil and waste system, full dimensional standardisation of the system was maintained, according to EN 1451. This means that connections of all diameters can be made without any need to use adapting connectors for non-standard diameters. Basic examples of connections are presented in the diagrams below.



Akavent fitting – operation

The Akavent is designed for high-rise buildings. Its construction separates the main stream of waste flowing through the stack from waste coming in from side stacks; this prevents the occurrence of “hydraulic plug”. It has additional internal ventilation which balances pressure and ensures appropriate supply of air without the need of using increased diameter or additional ventilation stack.

Waste flowing through the fitting is diverted towards the walls of the arch thanks to which the velocity of the waste is reduced. See below.



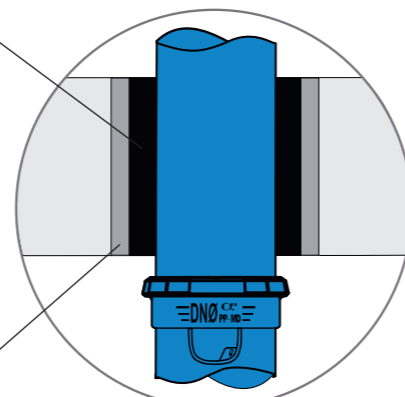
For further information on Akavents, please see our website.

Penetration through construction barriers

Insulating soil and waste ducts across construction barriers (Detail ‘A’) is an important part of the planning and design process. It is aimed at safeguarding the users against the “acoustic bridges” in construction barriers. These are points where a duct being in contact with the construction of a building transfers acoustic vibrations generated by the flowing waste.

The below details show the correct penetration of an acoustic duct through a wall barrier. Each penetration should be secured with a sleeve (3 – 5 mm) made of material ensuring proper acoustic and moisture insulation. Fire regulations must be adhered to at all times. For further information please speak to a member of our Technical Services team.

Insulation material:
acoustic insulation
moisture insulation



Filing with construction mortar

THE EXPERTS IN FABRICATED DRAINAGE

Save time on site by utilising the skills at Aliaxis to build your bespoke fabricated soil system in the material of your choice



SAVES MONEY



SAVES WASTE



QUALITY, ASSURED



SAVES STORAGE



EXPERTISE



DELIVERY WHEN YOU NEED IT



SAVES TIME



SIMPLIFICATION



SITE SAFETY



Air testing

Testing

Testing of rubber ring joint gravity drainage systems is important to assess the correct installation and following use of the drainage system. The testing is regulated via the EN12056-5: Gravity drainage systems inside building - Part 5: "Installation and testing, instructions for operation, maintenance and use".

There is no need for a water test to be applied for the whole plumbing system at once. The maximum pressures during such test would far exceed the maximum pressures during a blockage of the system. The part of a drainage system which is principally at highest risk, is that situated below the level of the lowest sanitary appliance. Before testing these parts will have to be identified.

Identify maximum pressure values

Various blockage scenarios can be identified to find the maximum pressure values relevant for specific situations. Important is to recognize that the maximum water height is limited by the lowest sanitary appliance as this will be an exit point of the pipe system. Situations can be grouped in the following categories depending on the severity of the blockage:

- Single appliance
- Multiple appliances
- In the stack

The dBlue gravity drainage system is to be tested using the methodology described in this chapter.

Where there are water restrictions or the network provider has a water management strategy, hydrostatic testing may not be permitted, in which case an air or vacuum seal test must be conducted. Testing using smoke systems is not recommended.

During design of the system inspection openings should be added to allow for inspection, maintenance and testing.



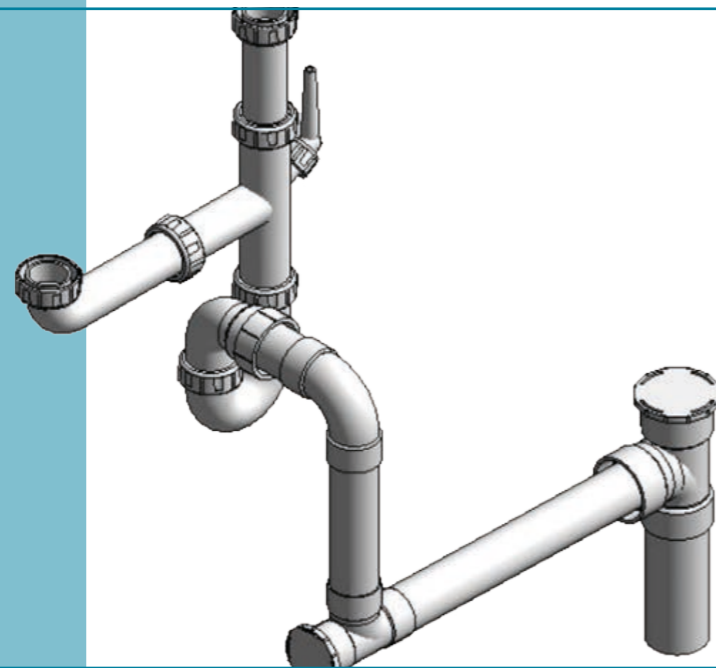
THE TECHNICAL EXPERTS IN PLUMBING & DRAINAGE

BIM Files

Using BIM technology at the design stage of a project helps to detect clashes within a building, instead of experiencing them on site. How the sanitary pipework system fits within these constraints can now be tested using the Aliaxis BIM files.













BIM expertise is now part of our Technical Services Team.

Visit alixis.co.uk



Our technical team can help you specify the system you need

Years of experience mean that we can support you throughout your design process and assist with any technical and installation requirements.

- | | | | |
|--|--|--|--|
|  DESIGN SERVICES |  VALUE ENGINEERING |  TECHNICAL ADVICE |  FABRICATIONS SERVICE |
|  RAINWATER CALCULATIONS |  MATERIAL TAKE-OFFS |  CAD FILES |  BIM OBJECTS |
|  SPECIFICATION |  SPECIAL FABRICATIONS |  IN-HOUSE AND EXTERNAL TRAINING |  ESTIMATES |

The current state of knowledge about chemical resistance of plastics is based on long-lasting laboratory tests and practical experience. The following evaluation can be an initial indicator of the possibilities of dBlue application for fluid transportation including transport at elevated temperatures. dBlue pipes and fittings and rubber gaskets are meant for transporting waste water ranging from acids (pH 2) to alkalis (pH 12) present in households. In case of industrial waste water, its chemical composition and concentration should be analyzed. The table covers a set of chemicals and determination of dBlue chemical resistance.

The following evaluation criteria were adopted:

Used symbols:

| | |
|-------------|---|
| + | Resistant: in general dBlue is a suitable material for this application |
| / | Limited resistance: further research necessary |
| - | No resistance |
| Empty field | No data available |

Abbreviations:

| | |
|----------|---|
| Sat. sol | Saturated aqueous solution: prepared at 20°C |
| Sol | Aqueous solution at a concentration higher than 10% but not saturated |

| Component | Concentration | Temperature | | |
|----------------------------|---------------|-------------|-------|--------|
| | | 20 °C | 60 °C | 100 °C |
| Acetic acid | Up to 40% | + | + | |
| Acetic acid | 50% | + | + | / |
| Acetic acid, glacial | >96% | + | / | - |
| Acetic anhydride | 100% | + | | |
| Acetone | 100% | + | + | |
| Acrylonitrile | 100% | + | | |
| Allyl alcohol | 100% | + | + | |
| Ammonia, aqueous | Sat. sol | + | + | |
| Ammonia, dry gas | 100% | + | | |
| Ammonia, liquid | 100% | + | | |
| Ammonium acetate | Sat. sol | + | + | |
| Ammonium chloride | Sat. sol | + | + | |
| Ammonium nitrate | Sat. sol | + | + | + |
| Ammonium sulphate | Sat. sol | + | + | + |
| Aniline | 100% | + | + | |
| Beer | | + | + | |
| Benzene | 100% | / | - | - |
| Benzoic acid | Sat. sol | + | + | |
| Borax | Sol | + | + | |
| Boric acid | Sat. sol | + | | |
| Bromine, liquid | 100% | - | - | - |
| Butane, gas | 100% | + | | |
| Butanol | 100% | + | / | / |
| Butyl acetate | 100% | / | - | - |
| Calcium carbonate | Sat. sol | + | + | + |
| Calcium nitrate | Sat. sol | + | + | |
| Carbon dioxide, dry gas | | + | + | |
| Chlorine, dry gas | 100% | - | - | - |
| Chlorine, liquid | 100% | - | - | - |
| Chloroform | 100% | / | - | - |
| Chlorosulphonic acid | 100% | - | - | - |
| Chromic acid | Up to 40% | + | / | - |
| Citric acid | Sat. sol | + | + | + |
| Copper (II) chloride | Sat. sol | + | + | |
| Cyclohexanone | 100% | / | - | - |
| Dextrin | Sol | + | + | |
| Dichloroethylene (A and B) | 100% | / | | |
| Dichloromethane | 100% | / | - | |
| Ethanolamine | 100% | + | | |

| Component | Concentration | Temperature | | |
|---|----------------|-------------|-------|--------|
| | | 20 °C | 60 °C | 100 °C |
| Ethyl alcohol | Up to 95% | + | + | + |
| Ethyl ether | 100% | + | / | |
| Ethylene glycol | 100% | + | + | + |
| Formaldehyde | 40% | + | | |
| Formic acid | 10% | + | + | / |
| Gasoline, petrol (aliphatic hydrocarbons) | | - | - | - |
| Glycerine | 100% | + | + | + |
| Glycolic acid | 30% | + | | |
| Hexane | 100% | + | / | |
| Hydrochloric acid | Up to 20% | + | + | + |
| Hydrochloric acid | 30% | + | / | / |
| Hydrogen peroxide | Up to 30% | + | / | |
| Hydrogen sulphide, dry gas | 100% | + | + | |
| Lactic acid | Up to 90% | + | + | |
| Magnesium chloride | Sat. sol | + | + | |
| Magnesium sulphate | Sat. sol | + | + | |
| Milk | | + | + | + |
| Monochloroacetic acid | >85% | + | + | |
| Nitric acid | Up to 30% | + | - | - |
| Nitric acid | From 40 to 50% | / | - | - |
| Oleic acid | 100% | + | / | |
| Oleum (sulphuric acid with 60% of +o3) | | + | / | |
| Oxalic acid | Sat. sol | + | / | - |
| Oxygen, gas | | + | | |
| Phenol | 90% | + | | |
| Potassium bromate | Up to 10% | + | + | |
| Potassium chlorate | Sat. sol | + | + | |
| Potassium chromate | Sat. sol | + | + | |
| Potassium cyanide | Sol | + | | |
| Potassium dichromate | Sat. sol | + | + | + |
| Potassium ferricyanide | Sat. sol | + | + | |
| Potassium hydroxide | Up to 50% | + | + | + |
| Potassium nitrate | Sat. sol | + | + | |
| Potassium permanganate | (2 N) 30% | + | | |
| Propane, gas | 100% | + | | |
| Pyridine | 100% | / | | |
| Seawater | | + | + | + |
| Sodium chlorate | Sat. sol | + | + | |
| Sodium hydroxide | From 10 to 60% | + | + | + |
| Sodium hypochlorite | From 10 to 15% | + | | |
| Sodium sulphite | 40% | + | + | + |
| Sulphuric acid | Up to 10% | + | + | + |
| Sulphuric dioxide, dry or wet | 100% | + | + | |
| Tartaric acid | Sat. sol | + | + | |
| Tin (IV) chloride | Sol | + | + | |
| Tin (II) chloride | Sat. sol | + | + | |
| Toluene | 100% | / | - | - |
| Trichloroethylene | 100% | - | - | - |
| Urea | Sat. sol | + | + | |
| Vinegar | | + | + | |
| Wines | | + | + | |
| Xylene | 100% | - | - | - |

British & European Standards

BS EN 1451

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Polypropylene (PP). Specifications for pipes, fittings and the system.

BS EN 1329-1

Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure – PVCu.

BS EN 1411

Plastics piping and ducting systems. Thermoplastics pipes. Determination of resistance to external blows by the staircase method.

BS EN 14366

Laboratory measurement of noise from waste water installations.

BS EN 13501

Fire classification of construction products and building elements.

DIN 4102

Plastics piping systems. Thermoplastics piping systems for soil and waste discharge inside buildings. Test method for resistance to elevated temperature cycling.

BS EN 1055

Plastics piping systems. Thermoplastics piping systems for soil and waste discharge inside buildings. Test method for resistance to elevated temperature cycling.

BS EN 1054

Plastics piping systems. Thermoplastics piping systems for soil and waste discharge. Test method for airtightness of joints.

BS EN 681

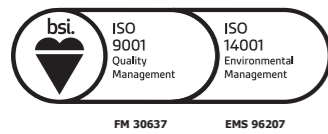
Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications.

BS EN ISO 9001: 2008

Quality systems. Model for Quality Assurance in Design, Development, Production, Installation and Servicing.

BS EN ISO 14001: 2004

Environmental management systems. Requirements with guidance for use.



Approvals

dBlue has been approved by the following certification bodies:





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V1 04.25

