ashirvad

by aliaxis

LOW NOISE SWR SYSTEM

KEEPING IT SILENT

TECHNICAL MANUAL

FOR BEST RESULTS, USE ONLY ASHIRVAD LOW NOISE PIPES, FITTINGS & ACOUSTIC GIRPI BRACKET AS AN ENTIRE SYSTEM

WARRANTY APPLICABLE ONLY IF ASHIRVAD PIPES, FITTINGS & SOLVENT CEMENT OR LUBRICANT ARE USED

SILENT SWR SYSTEMS

13 dB at 2 lps

SILENT PLUS SWR SYSTEMS

10 dB at 2 lps

GIRPI

TECHNOLOGY FROM FRANCE

Low noise soil waste and rain water system

Ashirvad Low Noise (silent and silent plus) SWR systems deliver a convincing performance distinguished by superior quality and excellent noise insulation values.

High perceived quality and attractive appearance

Abrasion resistant, smooth inner layer

Dependable leak proof joints

Highly rigid

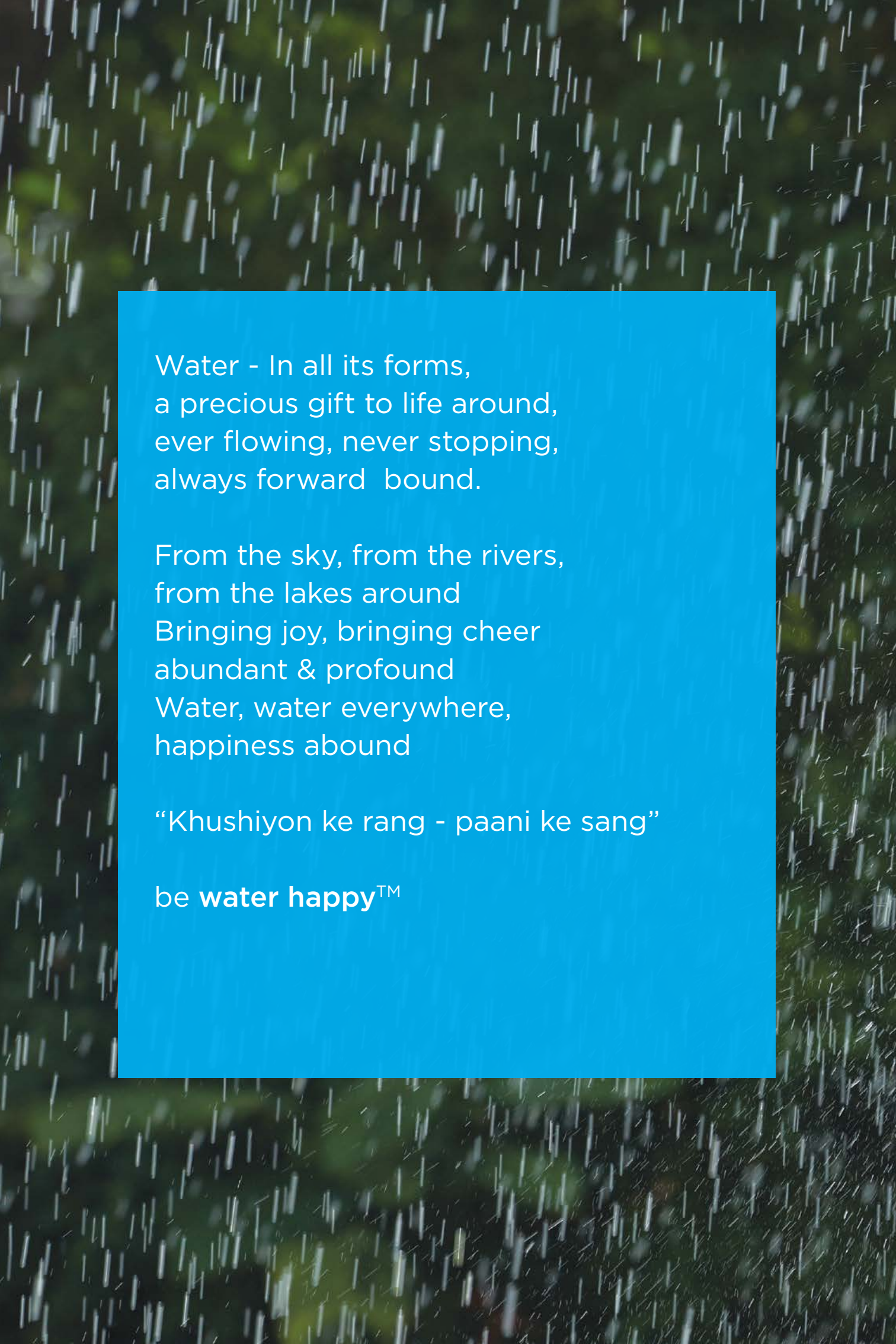
Acoustically inherent sound insulating properties

Noise insulation of silent SWR system is <13dB at 2 lps flow rate

Noise insulation of silent plus SWR system is <10dB at 2 lps flow rate

ashirvad
SWR SILENT
ashirvad
SWR SILENT PLUS

Index

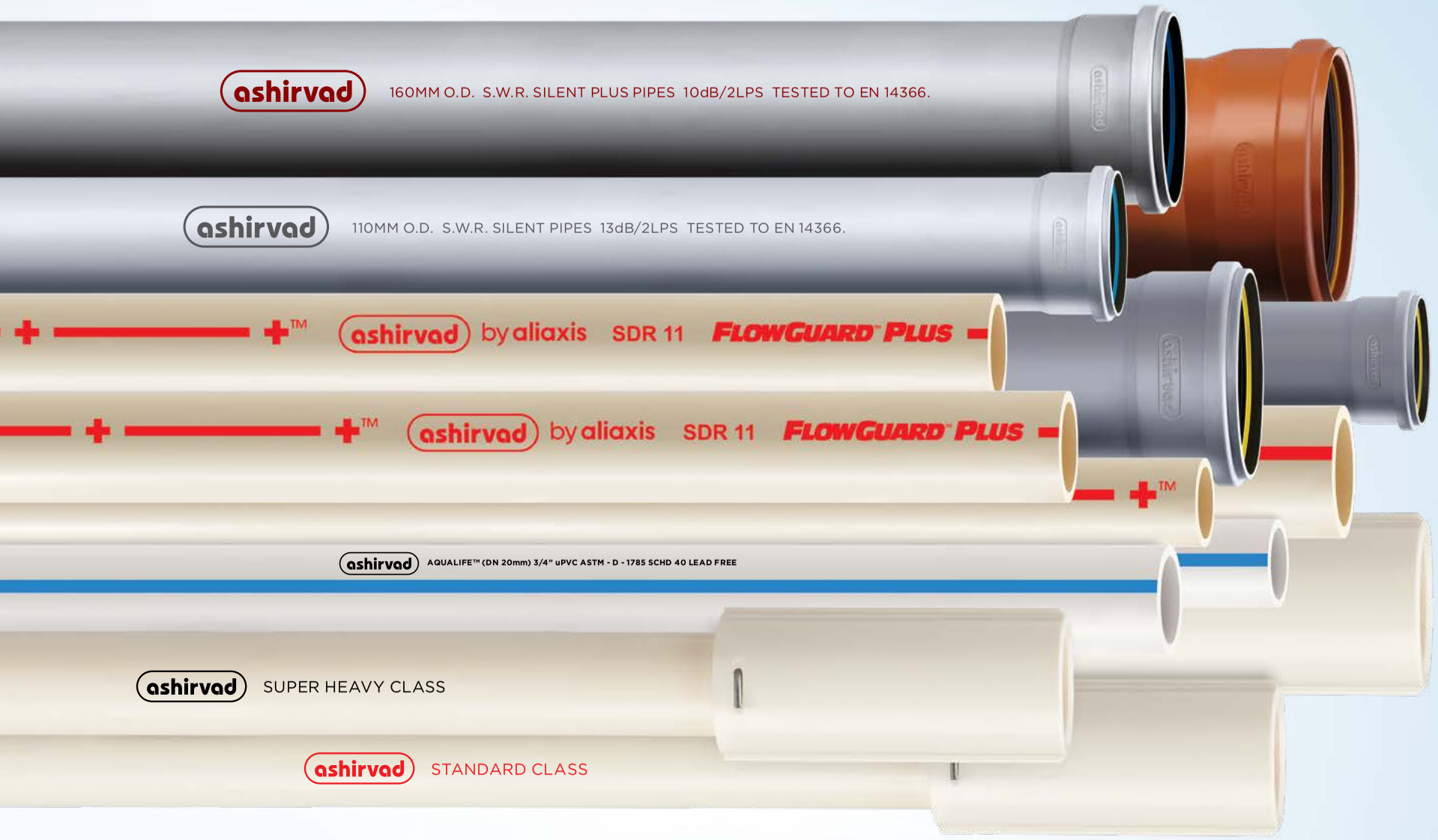


Water - In all its forms,
a precious gift to life around,
ever flowing, never stopping,
always forward bound.

From the sky, from the rivers,
from the lakes around
Bringing joy, bringing cheer
abundant & profound
Water, water everywhere,
happiness abound

“Khushiyon ke rang - paani ke sang”

be **water happy**™


ashirvad
160MM O.D. S.W.R. SILENT PLUS PIPES 10dB/2LPS TESTED TO EN 14366.
ashirvad
110MM O.D. S.W.R. SILENT PIPES 13dB/2LPS TESTED TO EN 14366.
ashirvad by aliaxis SDR 11 FLOWGUARD PLUS
ashirvad by aliaxis SDR 11 FLOWGUARD PLUS
ashirvad AQUALIFE™ (DN 20mm) 3/4" uPVC ASTM - D - 1785 SCHD 40 LEAD FREE
ashirvad SUPER HEAVY CLASS
ashirvad STANDARD CLASS

About Ashirvad

Ashirvad an Aliaxis group company, setup its Bengaluru unit in 1998 and is a wholly owned company of Aliaxis group. Aliaxis group is a global leading manufacturer and distributor of plastic fluid handling systems used in residential, commercial and industrial buildings. Aliaxis, headquartered in Brussels and is present over 45 countries with more than 100 manufacturing and commercial entities, employs over 16,000 people and generates more than 3 billion Euro (₹ 21, 600 crores approx) in annual sales.

Ashirvad has always been relentless in its commitment to quality and services. Ashirvad pipes is a leading manufacturer and supplier of CPVC, uPVC, SWR plumbing systems and also the pioneer in designing and manufacturing of uPVC column pipes, which are used in the erection of submersible borehole pumps. Today Ashirvad Pipes is the world's largest manufacturer of uPVC column pipes and successfully exporting to 40+ countries. The CPVC Hot and Cold plumbing system is manufactured in collaboration with Lubrizol, USA.

Ashirvad is an ISO 9001:2015, ISO 14001:2015 and ISO 45001:2018 certified company with a constant endeavour towards achieving the highest level of customer satisfaction.

Ashirvad, with a determination to be a one-stop-shop for Plumbing, Agriculture, Sanitary, High-rise and Fire Safety solutions, has recently expanded its product range and successfully introduced Agri Pipe, Casing Pipe, BlazeMaster® Pipes & Fittings by Ashirvad.

Capabilities:

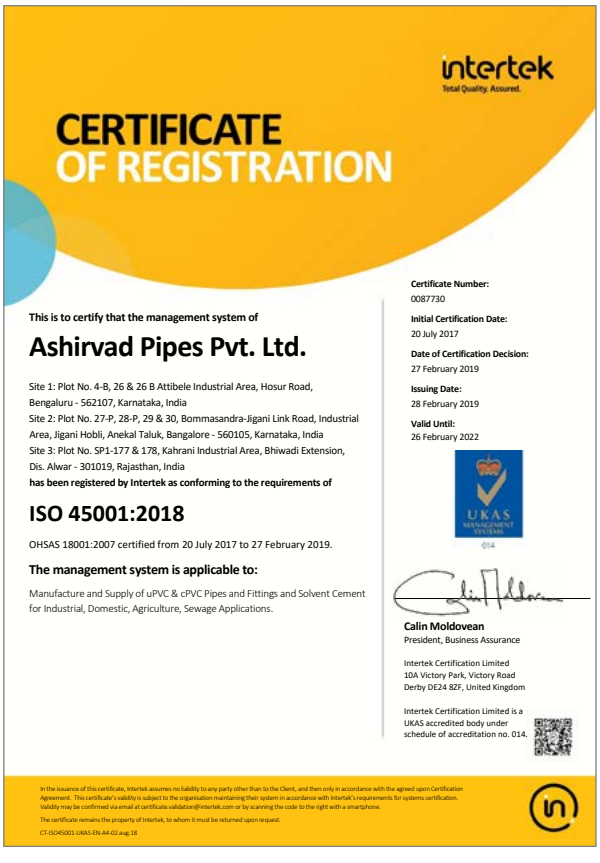
- Manufacturing capacity of more than 2,00,000 MT per annum
- Total factory area of 50 acres
- 500+ Strong Sales & marketing staff across India
- Strong team of 205 at corporate office
- Over 4,500 manufacturing workforce
- 17 warehouses, 1,100 distributors, 53,000 dealers across India
- Exporting Column Pipes to more than 40 countries
- 2 factories in Bengaluru and another one in Bhiwadi (Rajasthan) near Delhi

In 2007, Ashirvad won the National Award for **"OUTSTANDING ENTREPRENEURSHIP IN MEDIUM ENTERPRISES"**
The award was presented by the Prime Minister of India.

WCRC Leaders Summit - 2014
Ashirvad Pipes
"One Of The 100 Fastest Growing Marketing Brands In Asia"
(Evaluated and selected by KPMG)
The Global Audit Firm

Construction Industry Database (CIDC) - 2016 Has been enlisted as an **Approved Vendor** for providing the following Services / Products
Manufacturing of
CPVC & uPVC Pipes & Fittings

Certifications



intertek
Total Quality. Assured.

CERTIFICATE OF REGISTRATION

This is to certify that the management system of

Ashirvad Pipes Pvt. Ltd.

Site 1: Plot No. 4-B, 26 & 26 B Attibele Industrial Area, Hosur Road, Bengaluru - 562107, Karnataka, India
Site 2: Plot No. 27-P, 28-P, 29 & 30, Bommasandra-Jigani Link Road, Industrial Area, Jigani Hobli, Anekal Taluk, Bangalore - 560105, Karnataka, India
Site 3: Plot No. SP1-177 & 178, Kahrani Industrial Area, Bhiwadi Extension, Dis. Alwar - 301019, Rajasthan, India
has been registered by Intertek as conforming to the requirements of

ISO 45001:2018

OHSAS 18001:2007 certified from 20 July 2017 to 27 February 2019.

The management system is applicable to:

Manufacture and Supply of uPVC & cPVC Pipes and Fittings and Solvent Cement for Industrial, Domestic, Agriculture, Sewage Applications.

Certificate Number: 0087730
Initial Certification Date: 20 July 2017
Date of Certification Decision: 27 February 2019
Issuing Date: 28 February 2019
Valid Until: 26 February 2022

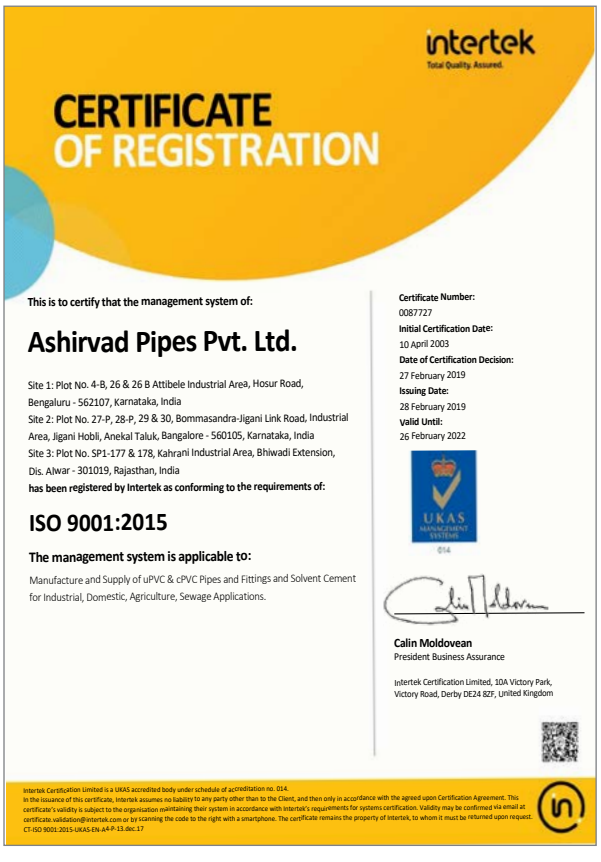
UKAS MANAGEMENT SYSTEMS 014

Calin Moldovean
President, Business Assurance

Intertek Certification Limited
10A Victory Park, Victory Road
Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

In the issuance of this certificate, Intertek assumes no liability to any party other than to the Client, and then only in accordance with the agreed upon Certification Agreement. This certificate's validity is subject to the organisation maintaining their system in accordance with Intertek's requirements for systems certification. Validity may be confirmed via email at certificate.validation@intertek.com or by scanning the code to the right with a smartphone.
The certificate remains the property of Intertek, to whom it must be returned upon request.
CT-ISO45001-UKAS-EN-A4-02.aug.18



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Site 3: Plot No. SP1-177 & 178, Kahrani Industrial Area, Bhiwadi Extension, Dis. Alwar - 301019, Rajasthan, India
has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Manufacture and Supply of uPVC & cPVC Pipes and Fittings and Solvent Cement for Industrial, Domestic, Agriculture, Sewage Applications.

Certificate Number: 0087727
Initial Certification Date: 10 April 2003
Date of Certification Decision: 27 February 2019
Issuing Date: 28 February 2019
Valid Until: 26 February 2022

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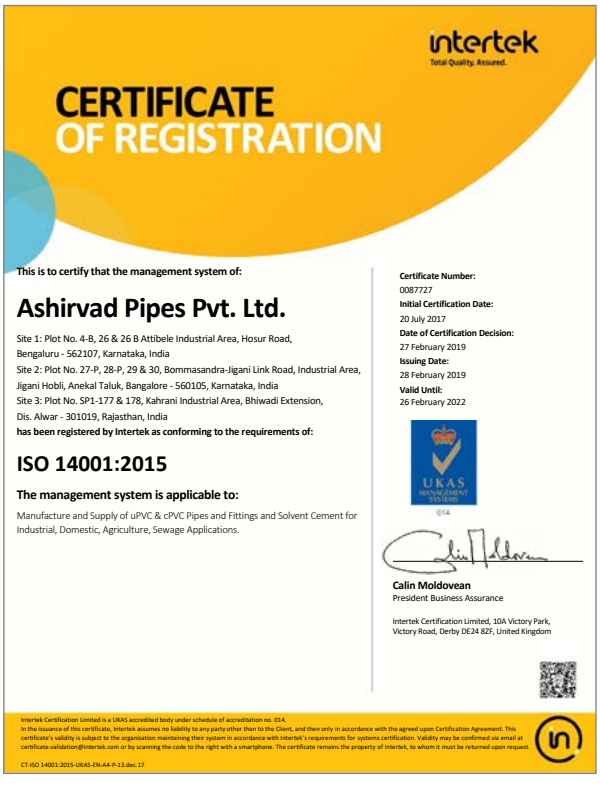
CT-ISO 9001:2015-UKAS-EN-A4-P-13.dec.17



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has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

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Certificate Number: 0087727
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CT-ISO 14001:2015-UKAS-EN-A4-P-13.dec.17

About Aliaxis

Aliaxis group is a leading global manufacturer and distributor of plastic fluid handling systems used in residential, commercial and industrial buildings.

Head quartered in Brussels, Belgium. Aliaxis is present in over 45 countries, has more than 100 manufacturing and commercial entities and employs over 16,000 people.

Aliaxis leverages local and global knowledge of the industry as well as regulations and building habits to provide consistently excellent customer service through distribution partners to builders, installers, infrastructure contractors and others. The group is in the Indian plumbing and sanitary market through a partnership with Ashirvad Pipes since 2013.

Aliaxis at a glance

€ 3.1 billion
Revenue

120+
Distribution centres

1.400+
Injection machines

16.000+
Colleagues

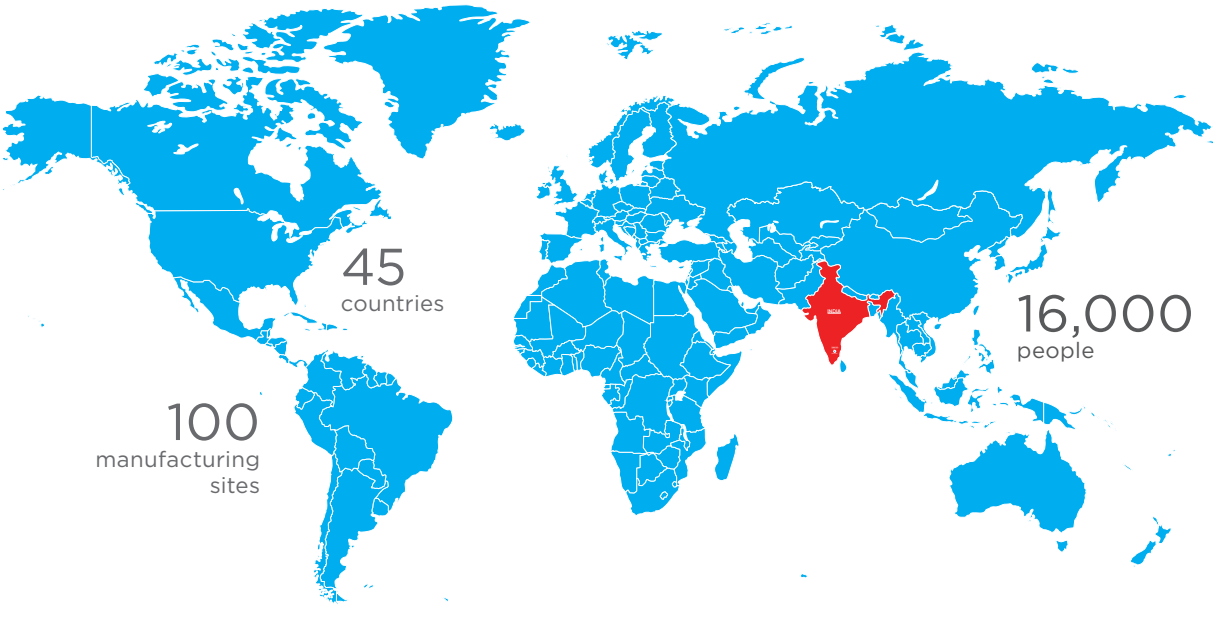
45+
Countries

600+
Extruders

€ 87 million
Capex

80+
Manufacturing sites

10
Commercial brands

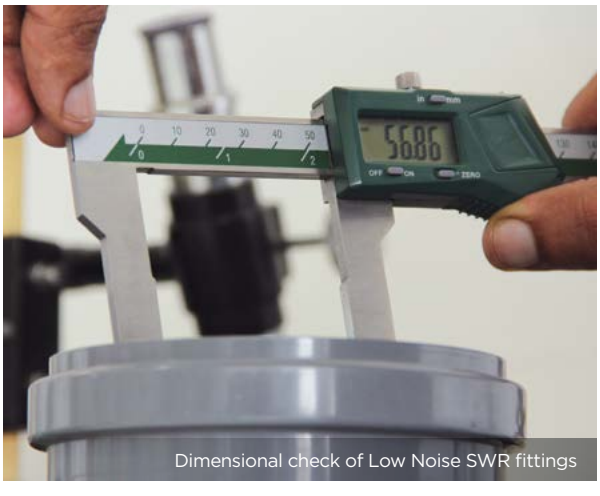


Ashirvad production plant

Injection Moulding Facility

Automated Raw material storage in Silos

Ashirvad workforce



Dimensional check of Low Noise SWR fittings

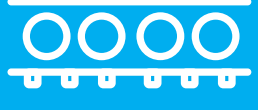
Extrusion Facility

10 ASSURANCES

#01
STATE OF THE ART
MANUFACTURING FACILITIES

#02
ADVANCED MACHINERY
FOR SUPERIOR QUALITY

#03
ADVANCED MATERIAL
HANDLING SYSTEMS

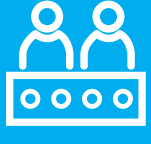


#04
100% INCOMING RAW
MATERIAL INSPECTION

#05
HIGH DIMENSIONAL ACCURACY
TO MAINTAIN QUALITY OF
EACH PIECE, TO ENSURE
A DEFECT FREE SYSTEM

Ashirvad's stringent quality checks ensure premium products and maximum customer satisfaction

#06
STRINGENT QUALITY CHECKS AT EVERY LEVEL OF PRODUCTION



#07
CHECKING OF GROOVES AND RINGS

#08
EVERY BATCH OF PRODUCTS LAB TESTED

#09
CONSTANT INNOVATION IN DESIGN FOR BETTER QUALITY

#10
REGULAR EXTERNAL LAB TESTING OF PRODUCTS IN INDIA

NOISE INSULATED BUILDINGS

Ashirvad Low Noise SWR products are used wherever sound protection is required. Silence plays a big role in areas such as:

- Work areas: Office buildings, conference rooms, etc.
- Study areas: Schools, colleges, libraries, community centers, etc.
- Sleeping areas: Houses, residences, apartments, etc.
- Commercial spaces: Hospitals, restaurants, hotels, etc.

About uPVC

Ashirvad offers an industry leading range of Low Noise SWR (silent and silent plus). These systems offer unparalleled installation options with high quality finish, superior dimensional accuracy and stability and are suitable for all types of commercial and domestic installations where noise insulation plays a major role.

These pipes are extruded on state-of-the-art extruders and are socketed on inline belling machines. The fittings are manufactured in collapsible core moulds to ensure straight sharp finish of the grooves for higher dimensional accuracy of the product which finally ensures the highest degree of dimensional accuracy and product strength.

Ashirvad Low Noise SWR system thus provides excellent sound insulation, creates ideal conditions for buildings and contributes to an increase in the property value along with the quality of life. All this is backed by extensive technical research to support all aspects of design and installation. Generic properties of uPVC are mentioned below.

Physical Properties

Density [g/cm^3]	1.3 - 1.45
Thermal conductivity [w/(m.k)]	0.14 - 0.28
Yield strength [MPa]	31 - 60
Young's modulus [psi]	4,90,000
Flexural strength (yield) [psi]	10,500
Compression strength [psi]	9,500
Coefficient of thermal expansion (linear) [mm (mm"c)]	5 x 10^{-5}
Vicat B [°c]	65 - 100
Resistivity [Qm]	10^{16}
Surface resistivity [Q]	$10^{1\,3}$ - 10^{14}

Fire Resistant

Ashirvad Low Noise SWR systems are self-extinguishing and do not support combustion. They are therefore ideally suited for use in buildings and houses. uPVC must be forced to burn due to its high Oxygen Index (LOI) of 45. LOI is the percentage if oxygen needed in an atmosphere to support combustion.

Material	**LOI**
Cotton	16 - 17
Polypropylene (PP)	18
Polyethylene (PE)	18
Wood	20
CPVC	60
Atmospheric content of OXYGEN	21
PVC	45

What is Noise?

Noise is often defined as 'sound which is undesired by the recipient' due to its intensity or persistence. Noise is produced due to constant knocking or percussion. It is very important to minimize the impact between materials in order to reduce noise.

How is Noise transmitted?

Noise is often transmitted due to vibration of a material, which can be a solid, liquid or air. The resistance offered by a material to noise depends on its density, and in turn determines the speed of the sound wave. When the medium changes – for example, a sound is transmitted from water to air – part of the energy is absorbed, part is reflected and the rest is transmitted i.e., passed on to the other medium.

Noise reduction in Soil and Waste water systems

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.

Air-borne Noise

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

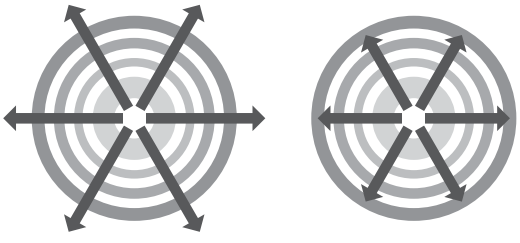
Structure-borne Noise

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 mentioned before, which being limited by pipes and fittings makes them vibrate (acoustic resonance). The resonance is transmitted through a system of pipe clamps 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 a minimum.

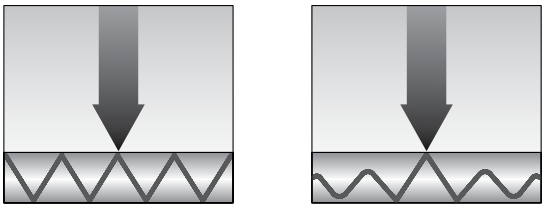
Noise in bathroom is generated when change of direction occurs or due to filling of products or during discharge of sanitary appliances. The Low Noise system from Ashirvad only caters to the noise in the SWR system.

Sound reduction with Ashirvad Low Noise SWR system

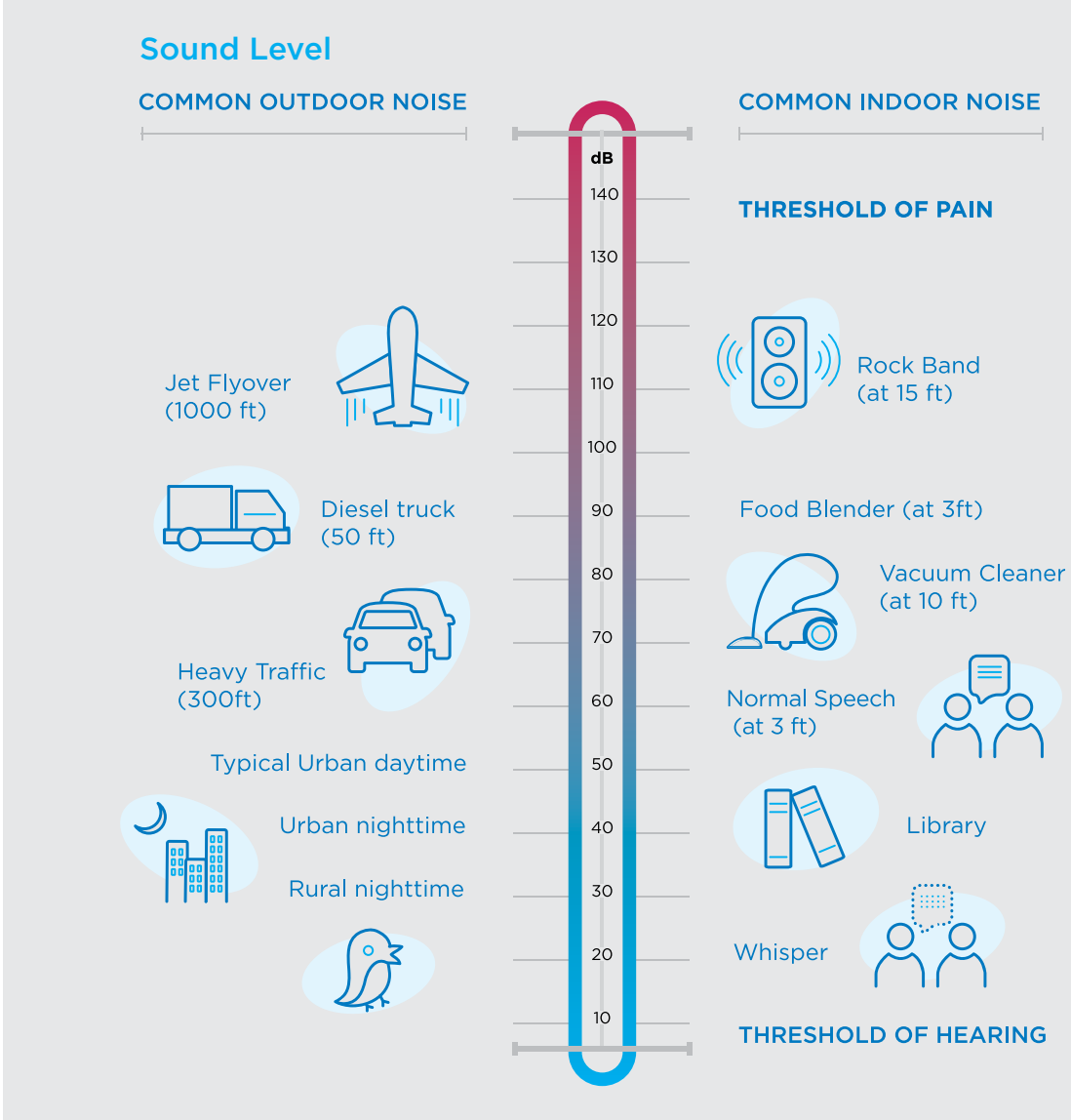
Ashirvad Low Noise SWR system was developed by considering the effects of both Air borne and Structural noise. The voice waves diffusing by airway form a pressure inside the environment and surface it beats. The high molecular special formula used in the middle layer of three layer pipe absorbs this noise and avoids if from going out.



By air: Conventional pipe



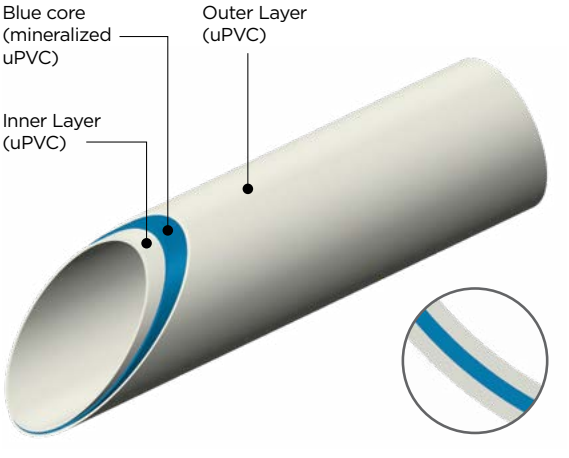
By contact: Ashirvad Low Noise SWR pipe



ashirvad by aliaxis

What is Low Noise SWR system?

Low Noise SWR system is a combination of pipes, fittings and brackets that is specially designed to reduce the noise that accompanies during the flow of water and waste in the system. Ashirvad low noise pipes are made from an innovative three layer uPVC structure, which is one of the finest technologies in the plumbing world.



The outer and inner layer are made of uPVC and middle layer made of mineralized uPVC which has better sound absorbing character. Both the outer and inner layers provide much needed impact resistance to the pipes due to the special formulation that is adapted along with high rigidity and UV resistance. The inner layer is also abrasion resistant and extremely smooth to allow high flow rates.

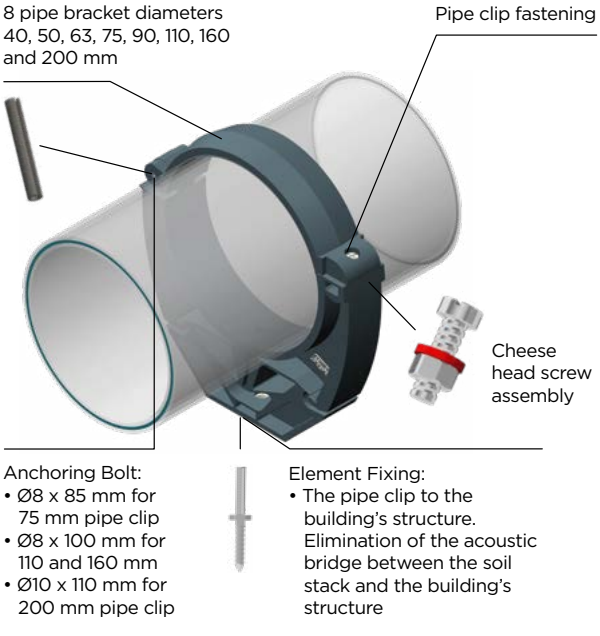
Pipe Brackets

Ashirvad pipe brackets are manufactured under license from GIRPI (Aliaxis group) and is patented. These patented pipe clamps absorb the vibrations from the pipe and reduce structural noise. They have a hinge opening and single point of fixation.

Ashirvad pipe brackets are available in sizes ranging from 40, 50, 63, 75, 90, 110, 160 and 200 mm. The pipe is allowed to move freely inside the bracket as it expands and contracts without risking damage by abrasion.

These special pipe clamps provide very high acoustic performances at optimized costs. They can be used on vertical and horizontal sections for both anchoring and guide configurations.

The brackets are made of high quality polypropelene and are UV resistant to protect against sunlight. Their hinge opening mechanism allows easy access to remove pipes for maintenance or replacement.



Why Ashirvad Low Noise SWR?

Designed to meet strictest demands for strength and other mechanical properties, this thick walled, high density Low Noise SWR drainage system is additionally featured with sound reducing aspects. This makes it suitable for the projects where sound beyond certain decibel level is not desirable. Thus a combination of strength and low noise aspects has made this product a much better solution for building drainage.

We offer fully accredited product systems. Ashirvad Low Noise SWR Pushfit systems are available in sizes ranging from 75, 90, 110, 160 and 200 mm in both silent and silent plus range and Solfit systems are available in sizes ranging from 40, 50, 63, 75 and 90 mm in silent.

Wide range of pipes and fittings

Complete product range in Pushfit - rubber seal type joints and Solfit – solvent fitted are made available to cater to each and every installation requirement.

Under technical collaboration from GIRPI*

Ashirvad under technical collaboration from GIRPI, France introduces specially designed robust pipe clamps to avoid structural borne noise.

Fully analyzed raw materials

The raw materials used for manufacturing the products are fully analyzed and procured with utmost care to deliver high quality products to the customers.

Best manufacturing standards

The pipes are extruded on state-of-the-art extruders and are socketed on online belling machines. The fittings are manufactured in collapsible core moulds to ensure straight sharp finish of the grooves for higher dimensional accuracy of the product which finally ensures the highest degree of dimensional accuracy and product strength.

Smooth bore - better flow

No clogging - smooth and bright internal and external surfaces of Low Noise SWR help to avoid sedimentations and lime deposition.

Wide distribution network

Ashirvad has a wide distribution network throughout the country which makes it possible to find our products in local shops too.

Compatible with existing SWR systems

Ashirvad Low Noise SWR systems are compatible with existing SWR lines and thus can be used for retrofit or as a replacement to IS 13592 and IS 14735.

FEATURES AND BENEFITS OF ASHIRVAD SWR

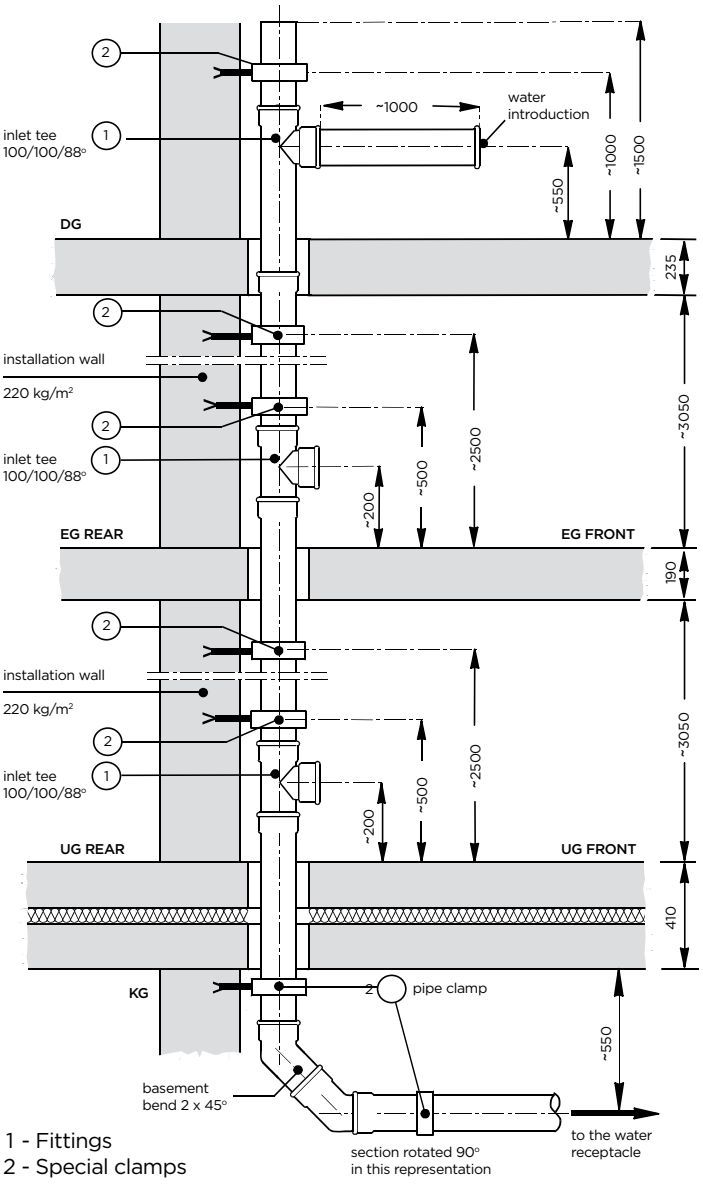
- Excellent noise insulation values
- Tried and tested 3 layer technology
- Easy to Install
- Maximum flow rate
- Longer service life
- Chemical and corrosion resistance
- Non toxic and non conductor
- Non flammable and environmental friendliness
- Precision sealing system
- Perfect alternative to cast iron
- Wide temperature resistance
- Technical support for design and installation
- Commercially viable SWR solution

GIRPI

*GIRPI, France is active since 1988 with their Friaphon system in the European markets. GIRPI designs and manufactures fittings and accessories made of synthetic materials for all types of applications.

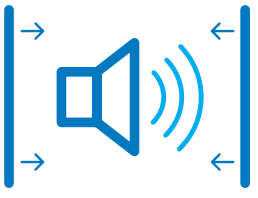
ashirvad
by aliaxis

Significant Acoustic Performance



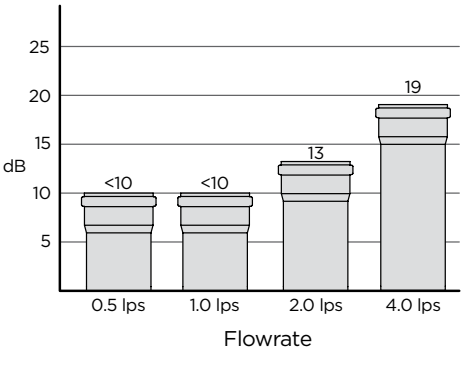
1 - Fittings
2 - Special clamps

Installation plan of the test set-up in the test facility at Fraunhofer Institute, Germany.

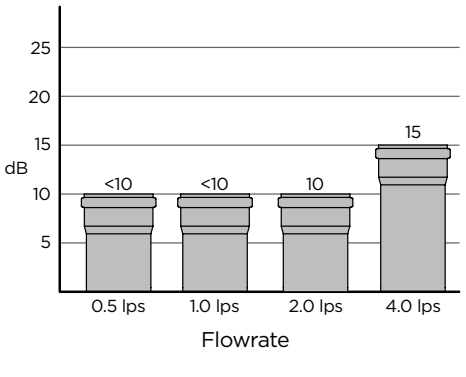


Ashirvad's Low Noise SWR (soil, waste and rain) systems (silent and silent plus) guarantees customer satisfaction, peace and living comfort. In practice, oriented measurements carried out by the officially recognized Fraunhofer Institute for Building Physics in Stuttgart, Germany Ashirvad's Low Noise SWR achieved a sound intensity level of **13 dB at 2 lps for silent SWR and 10 dB at 2 lps for silent plus SWR**. The below results are obtained by installation of Ashirvad's Low Noise SWR pipes, fittings and clamps as a system. Any combination of other brand products with the system may not give the same performance.

Ashirvad silent SWR



Ashirvad silent plus SWR



Fraunhofer test result for Ashirvad silent SWR system

Determination of the Installation Sound Level L_{In} in the Laboratory | **P-BA 312/2014e** | **Results sheet 1**

Client: ASHIRVAD PIPES PVT.LTD., 4-B, Attibele Industrial Area, Hosur Road, Bengaluru – 562 107, INDIA

Test specimen: Wastewater installation system consisting of plastic pipes and fittings "SILENT SWR" with plastic pipe clamps "SILENT PLUS, Ø 110" made by ASHIRVAD PIPES PVT.LTD. (test object no.: 10732-3; see figure 4 and 5)

Test set-up:
- The pipe system was mounted according to figure 4 (see also Annex A).
- The system consisted of wastewater pipes (nominal size OD 110), three inlet tees, two 45°-basement bends and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by lids supplied by the manufacturer.
  - Pipe system: Three layer pipes "110mm OD SILENT SWR PIPES", material uPVC , size OD 110 mm, wall thickness 3.2 mm, weight 1.84 kg/m, density 1.6 g/cm³. Single layer fittings, material uPVC, size OD 110, wall thickness 3.2 mm, density 1.45 g/cm³ (values are manufacturers' information). Plug connection of the pipes and fittings come with a co-moulded rubber ring to absorb vibrations and cater to any thermal expansion and contraction.
  - Pipe clamps "SILENT PLUS, Ø 110": Acoustic plastic pipe clamps (figure 5) without elastomer inlay. On each floor (EG and UG) two clamps were installed. The clamps were mounted with plastic underlay so that they are not unduly bent and the two parts of the safety clamps on each side of the bracket do not touch each other (figure 5). The clamps were fixed to the installation wall with dowels and screws.

The wastewater installation system was mounted by a technical firm under the authority of Fraunhofer IBP.

Test facility: Installation test facility P12, mass per unit area of the installation wall: 220 kg/m², mass per unit area of the ceiling: 440 kg/m². Installation rooms: sub-basement (KG), basement (UG) front, ground floor (EG) front and top floor (DG), measuring rooms: UG front, UG rear (details in Annex P and EN 14366: 2005-02)

Test method: The measurements were performed following EN 14366: 2005-02 and German standard DIN 4109-11: 2010-05; noise excitation by constant water flow with 0.5 l/s, 1.0 l/s, 2.0 l/s and 4.0 l/s (details in Annexes A and F). Additional evaluation according to VDI 4100: 2012-10

Result:

Wastewater installation system consisting of plastic pipes and fittings "SILENT SWR" with plastic pipe clamps "SILENT PLUS, Ø 110" made by ASHIRVAD PIPES PVT.LTD.

Flow rate [l/s]	0.5	1.0	2.0	4.0
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG front	45	50	52	54
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG rear	<10	14	18	23
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG front	43	47	50	52
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG rear	<10	10	14	20
Airborne sound pressure level $L_{a,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG front	45	50	52	54
Structure-borne sound characteristic level $L_{a,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG rear	<10	<10	13	19

Test date: November 17, 2014

Notes:
- The requirements of DIN 4109 and VDI 4100 only apply for the test room UG rear.
- Sound levels below 10 dB(A) are not mentioned in the test report, since they are subject to an increased measurement uncertainty and moreover are not noticeable in a normal living environment.

Fraunhofer IBP

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2005 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

Stuttgart, April 7, 2015
Head of Laboratory:

ashirvad by aliaxis

Fraunhofer test result for Ashirvad silent plus SWR system

Determination of the Installation Sound Level L_{In} in the Laboratory — **P-BA 313/2014e** — **Results sheet 1**

Client: ASHIRVAD PIPES PVT.LTD., 4-B, Attibele Industrial Area, Hosur Road, Bengaluru – 562 107, INDIA

Test specimen: Wastewater installation system consisting of plastic pipes and fittings "SILENT PLUS SWR" with plastic pipe clamps "SILENT PLUS, Ø 110" made by ASHIRVAD PIPES PVT.LTD. (test object no.: 10732-4; see figure 4 and 5)

Test set-up:
- The pipe system was mounted according to figure 4 (see also Annex A).
- The system consisted of wastewater pipes (nominal size OD 110), three inlet tees, two 45°-basement bends and a horizontal drain section. The inlet tees in the basement and in the ground floor were closed by lids supplied by the manufacturer.
  - Pipe system: Three layer pipes "110 mm OD SILENT PLUS SWR PIPES", material uPVC , size OD 110 mm, wall thickness 5.3 mm, weight 2.97 kg/m, density 1.6 g/cm³. Single layer fittings, material uPVC, size OD 110 mm, wall thickness 5.3 mm, density 1.45 g/cm³ (values are manufacturers' information). Plug connection of the pipes and fittings come with a co-moulded rubber ring to absorb vibrations and cater to any thermal expansion and contraction.
  - Pipe clamps "SILENT PLUS, Ø 110": Acoustic plastic pipe clamps (figure 5) without elastomer inlay. On each floor (EG and UG) two clamps were installed. The clamps were mounted with adjustable screws so that they are not unduly bent and the two parts of the safety clamps on each side of the bracket do not touch each other (figure 5). The clamps were fixed to the installation wall with dowels and adjustable screws.

The wastewater installation system was mounted by a technical firm under the authority of Fraunhofer IBP.

Test facility: Installation test facility P12, mass per unit area of the installation wall: 220 kg/m², mass per unit area of the ceiling: 440 kg/m². Installation rooms: sub-basement (KG), basement (UG) front, ground floor (EG) front and top floor (DG), measuring rooms: UG front, UG rear (details in Annex P and EN 14366: 2005-02)

Test method: The measurements were performed following EN 14366: 2005-02 and German standard DIN 4109-11: 2010-05; noise excitation by constant water flow with 0.5 l/s, 1.0 l/s, 2.0 l/s and 4.0 l/s (details in Annexes A and F). Additional evaluation according to VDI 4100: 2012-10

Result:

Wastewater installation system consisting of plastic pipes and fittings "SILENT PLUS SWR" with plastic pipe clamps "SILENT PLUS, Ø 110" made by ASHIRVAD PIPES PVT.LTD.

Flow rate [l/s]	0.5	1.0	2.0	4.0
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG front	44	49	51	54
Installation sound level $L_{AFeq,n}$ (L_{In}) [dB(A)] **according to DIN 4109** measured in the basement test-room UG rear	<10	11	15	20
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG front	42	46	49	52
Installation sound level $\overline{L_{AFeq,nT}}$ (L_{In}) [dB(A)] **according to VDI 4100** measured in the basement test-room UG rear	<10	<10	11	17
Airborne sound pressure level $L_{a,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG front	44	49	51	54
Structure-borne sound characteristic level $L_{sc,A}$ [dB(A)] **according to EN 14366** in the basement test-room UG rear	<10	<10	10	15

Test date: November 18, 2014

Notes:
- The requirements of DIN 4109 and VDI 4100 only apply for the test room UG rear.
- Sound levels below 10 dB(A) are not mentioned in the test report, since they are subject to an increased measurement uncertainty and moreover are not noticeable in a normal living environment.

Fraunhofer IBP

The test was carried out in a laboratory, accredited according to DIN EN ISO/IEC 17025:2005 by DAkkS. The accreditation certificate is D-PL-11140-11-01.

Stuttgart, April 7, 2015
Head of Laboratory:

Why Pushfit?

Ashirvad Pushfit Low Noise SWR pipes and fittings are manufactured in sizes ranging from 75, 90, 110, 160 and 200 mm. This system comes with a pre-fitted rubber (**Blue Seal**™) in the groove that ensures a leak proof joint. The system is joined by simply pushing the spigot end into the socket end. This seal coupling system absorbs normal expansions in installations.

This requires no threading or solvent cementing. The spigot end is held firmly in the socket with the help of the **Blue Seal**™. It ensures a leak proof joint and can withstand high pressure flow. This system is made in high tech, new generation machines and offers unrivalled performance, strength and finish.

The advanced **Blue Seal**™ enables the joints to not only withstand high pressure and provide leak proof joints but also allows the thermal expansion and contraction of plastic. Since the joint is not fixed by solvent cement, it can be reopened after several hours of installation to realign, change or adjust the pipe/fitting.

Quick, easy and convenient installation

Corrosion and abrasion resistance

Smooth Inner finish

Tough and reliable

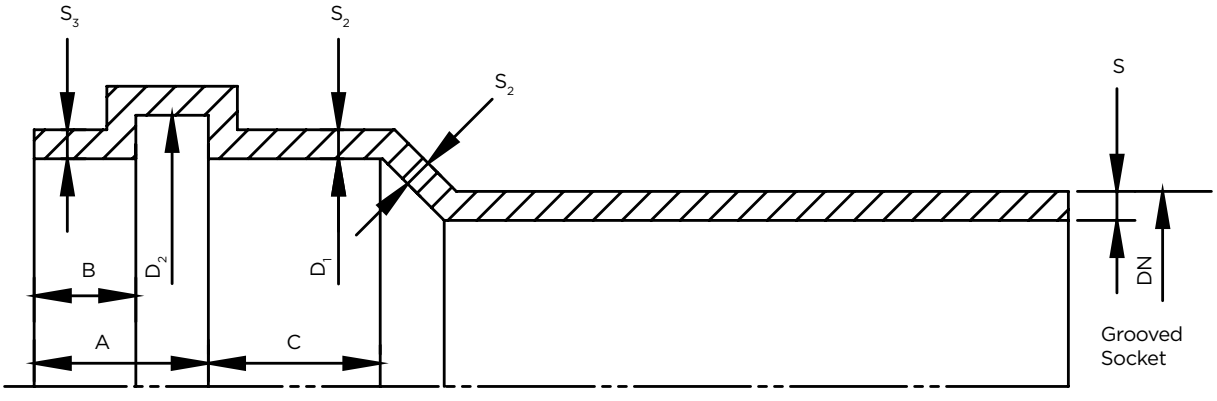
Cost effective

Thermal expansion

uPVC has a coefficient of expansion of approximately 0.06mm/m/°C. Consequently a 2m length of soil or waste pipe will expand by 2.4 mm for a 20°C rise in temperature. This expansion is taken into consideration in the design of systems and components, and must be accommodated when installing. It is important that this movement be allowed by including an expansion gap at ring seal joints. The spigot should be pushed fully into the ring seal socket, marked at the socket face, and then withdrawn by 10 mm. A subsequent check should be made to ensure that the expansion gap is not lost during further installation work.

Technical Specifications for silent SWR - Pushfit

Dimensions of pipes and fittings



Typical Groove design for elastomeric ring seal sockets

Dimensions of wall thickness

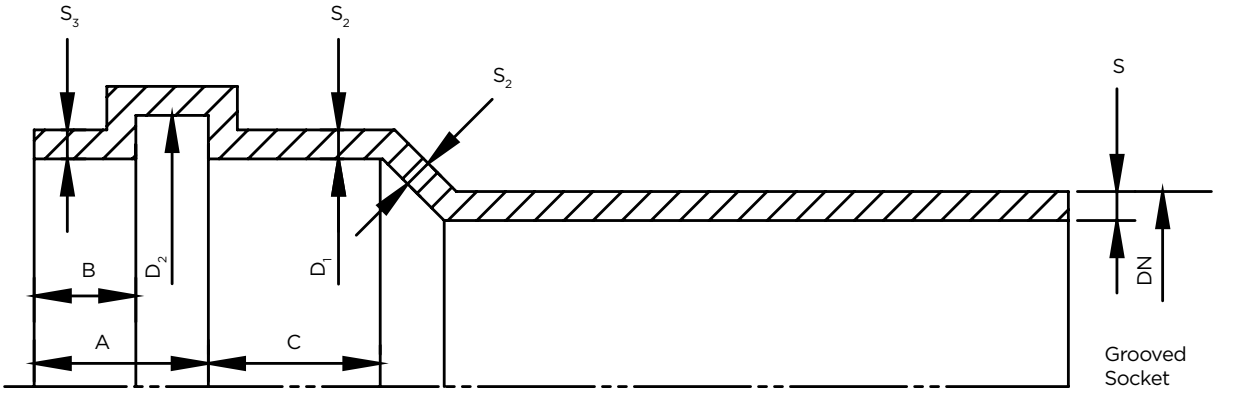
Nominal Outside Diameter DN (mm)	Mean Outside Diameter (mm)		Outside Diameter at Any Point (mm)		Wall Thickness S (mm)	Wall Thickness S2, (mm)	Wall Thickness S3, (mm)
	Min	Max	Min	Max	Min	Min	Min
75	75.0	75.3	74.1	75.9	**3.2**	2.9	2.4
90	90.0	90.3	88.9	91.2	**3.2**	2.9	2.4
110	110.0	110.4	108.6	111.4	**3.3**	2.9	2.4
160	160.0	160.5	158.0	162.0	**4.1**	3.6	3.0
200	200.0	201.6	197.6	202.4	**5.0**	4.4	3.7

Dimension of grooved socket

Nominal Outside Diameter DN (mm)	Inside Diameter of Socket, D1 (mm)		Inside Diameter of Beading, D2 (mm)		Length of Beading and Neck (mm) A	Neck of Socket (mm) B	Length Beyond Beading (mm) C
	Min	Max	Min	Max	Min	Min	Min
75	75.3	76.2	84.5	85.5	20	5	25
90	90.3	91.4	99.5	100.5	23	5	28
110	110.4	111.3	120.3	121.0	26	6	32
160	160.5	161.5	173.8	175.0	32	9	42
200	200.6	201.8	214.0	215.4	40	15	50

Technical Specifications for silent plus SWR - Pushfit

Dimensions of pipes and fittings



Typical Groove design for elastomeric ring seal sockets

Dimensions of wall thickness

Nominal Outside Diameter DN (mm)	Mean Outside Diameter (mm)		Outside Diameter at Any Point (mm)		Wall Thickness S2, (mm)	Wall Thickness S3, (mm)
	Min	Max	Min	Max	Min	Min
75	75.0	75.3	74.1	75.9	2.9	3.2
90	90.0	90.3	88.9	91.2	2.9	3.2
110	110.0	110.4	108.6	111.4	2.9	3.2
160	160.0	160.5	158.0	162.0	3.6	4.0
200	200.0	201.6	197.6	202.4	4.4	4.9

Dimensions of grooved socket

Nominal Outside Diameter DN (mm)	Inside Diameter of Socket, D1 (mm)		Inside Diameter of Bending, D2 (mm)		Length of Bending and Neck (mm) A	Neck of Socket (mm) B	Length Beyond Bending (mm) C
	Min	Max	Min	Max	Min	Min	Min
75	75.3	76.2	84.5	85.5	20	5	25
90	90.3	91.4	99.5	100.5	23	5	28
110	110.4	111.3	120.3	121.0	26	6	32
160	160.5	161.5	173.8	175.0	32	9	42
200	200.6	201.8	214.0	215.4	40	15	50

Dimensions of wall thickness

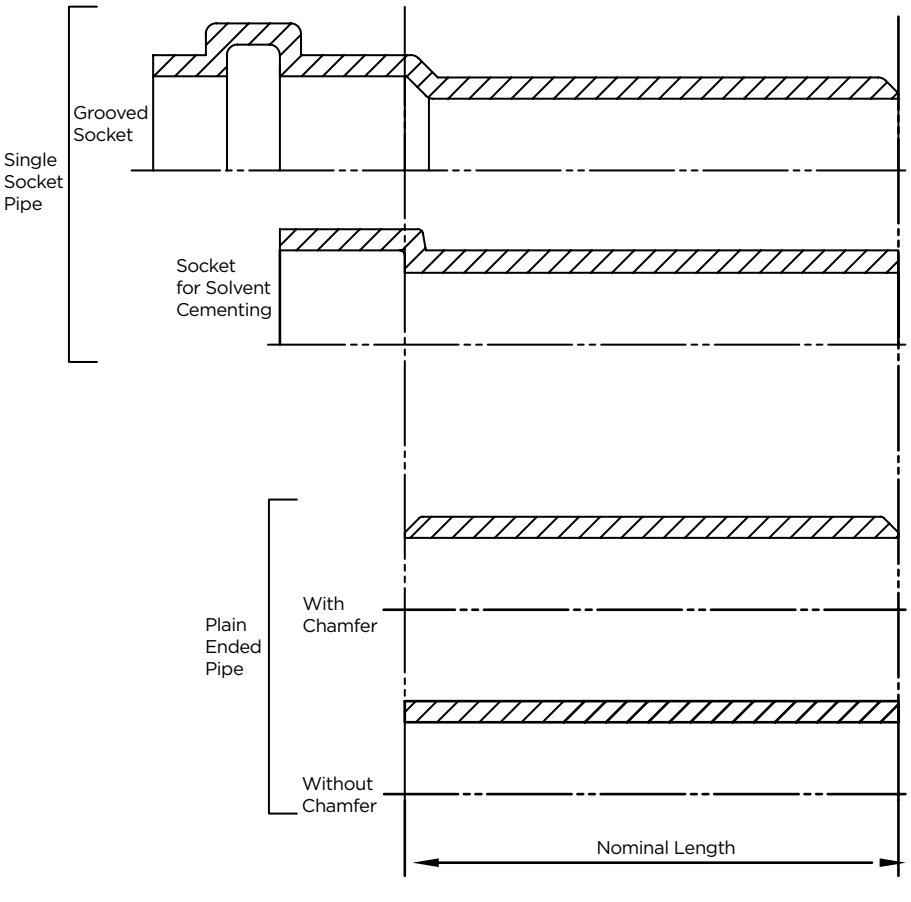
Pipe

Nominal Outside Diameter DN (mm)	Wall Thickness S, (mm) Min
75	**4.5**
90	**4.5**
110	**5.3**
160	**5.3**
200	**5.0**

Fittings

Nominal Outside Diameter DN (mm)	Spicot Wall Thickness S, (mm) Min
75	**4.5**
90	**4.5**
110	**5.3**
160	**5.3**
200	**5.0**

Measurement of effective length of pipe



Nominal pipe length and dimensional

Why Solfit in Ashirvad silent SWR?

Ashirvad Low Noise SWR Solfit pipes and fittings are manufactured in sizes ranging from 40, 50, 63, 75 and 90 mm in the silent range only. Ashirvad Solfit systems are joined by solvent cement. This system is made by new generation high tech machines and offer unrivalled performance, strength and finish.

100% leak proof joints

High flow rates - no choking

High degree of dimensional accuracy

Cost effective

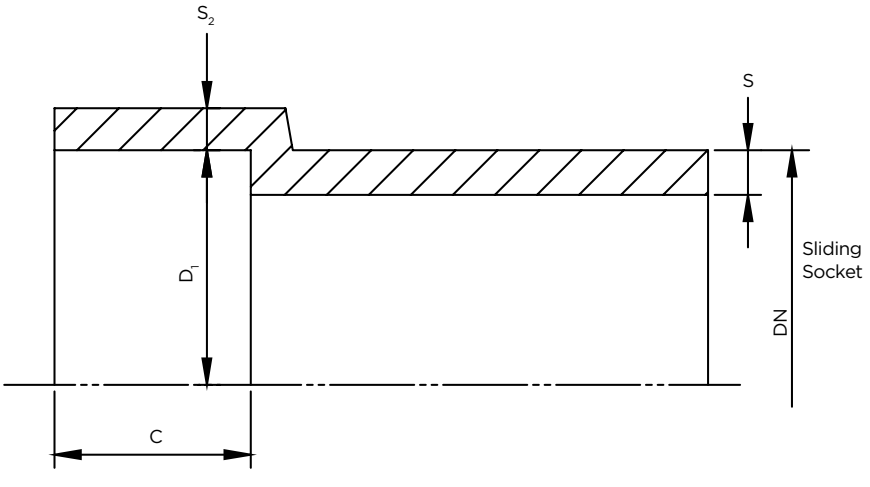
Ashirvad Low Noise SWR Solfit pipes and fittings, in the silent range are being introduced to cater to jointing in confined spaces. Additionally for SWR systems within bathrooms and under false ceiling smaller pieces of pipes which is plain ended is required.

Technical Specifications for silent SWR Solfit system

Dimensions of Wall Thickness

Nominal Outside Diameter DN (mm)	Mean Outside Diameter (mm)		Outside Diameter at Any Point (mm)		Wall Thickness S, (mm)
	Min	Max	Min	Max	Min
40	40.0	40.3	39.5	40.5	3.2
50	50.0	50.3	49.4	50.6	3.2
63	63.0	63.3	62.2	63.8	3.2
75	75.0	75.3	74.1	75.9	3.2
90	90.0	90.3	88.9	91.2	3.2

Dimensions of Pipes and Fittings



Solvent Cementing Socket Detail

Dimensions of Socket

Nominal Outside Diameter DN (mm)	Socket Depth C (mm)	Mean Inside Diameter of Socket, D1 (mm)		Wall Thickness S2, (mm)
	Min	Min	Max	Min
40	26.0	40.1	40.3	2.9
50	30.0	50.1	50.3	2.9
63	36.0	63.1	63.3	2.9
75	40.0	75.1	75.3	2.9
90	46.0	90.1	90.3	2.9

Availability of Ashirvad SWR silent and silent plus systems

Type	Pipe outer diameter (in mm)	Joining method	
		Pushfit	Solfit*
silent	40	X	✓
	50	X	✓
	63	X	✓
	75	✓	✓
	90	✓	✓
	110	✓	X
	160	✓	X
	200	✓	X
silent plus	75	✓	X
	90	✓	X
	110	✓	X
	160	✓	X
	200	✓	X

*Plain end pipes only

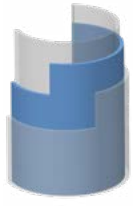
Note:
Pipes available with socket on single side.
Pipes available with socket on double side.

Technical Data

Low Noise SWR system products use mineralized uPVC with different mineral fillers, depending on component conditions.

Outer Layer

- Material - uPVC
- Color: (silent SWR - Light Grey / silent plus - Dark Grey)
- Impact resistant
- Resistant against high temperature variations
- Reinforces the pipe rigidity
- Provides protection against sunlight as it is UV resistant



Middle Layer

- Material - Mineral reinforced uPVC
- Color: (silent SWR and silent plus SWR - Blue)
- Highly rigid layer
- Due to its high molecular weighted structure and its special formula, it prevents the sound waves formed inside the pipe to transmit towards outside of the pipe

Inner Layer

- Material - uPVC
- Color - (silent SWR - Light Grey / silent plus - Dark Grey)
- Provides a superior flow performance with its smooth surface
- Prevents the corrosion which can form inside by the virtue of its chemical resistance

Quality Control Procedures at Ashirvad

The pipes and fittings manufactured at Ashirvad, follow a stringent quality control process before being rolled out into the market, in order to supply a defect free system to its users.

FOR PIPES

Dimensional Check
To ensure that all pipe dimensions, particularly wall thickness and outer diameter (roundness), conform to the appropriate standards.

Heat Reversion Test
How much the pipe changes in length when heated in an oven and left to cool. This is a measure of residual stresses left in the pipe during production process.

Density Test
The mass of the specimen of the solid plastic in air is first measured. It is then immersed in a liquid and its apparent mass upon immersion is measured.

FOR FITTINGS

Dimensions Check
To ensure that fittings have correct dimensions, particularly wall thickness, socket diameters and socket depth.

Drop Impact Test
Weights are dropped on the pipe to observe any cracks or failures.

FOR SYSTEM

Air-tightness Test
The pipes, fittings and joints should be capable of withstanding an air or smoke test of +ve pressure of 38 mm water gauge for at least 3 mins and upto 15 mins.

Water-tightness Test
The pipes, fittings and joints should be capable of withstanding a water column of 10 feet. Inspection for any leakage must start 15 mins after the water has been put into the stack to be tested.

OTHER TESTS

- Color
- Visual appearance
- Vicat softening temperature
- Impact test
- Water tightness of joints
- Stress relief test

SMART WATER MANAGEMENT

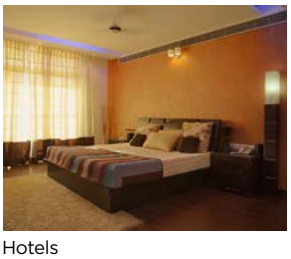
With technical tie ups from across the globe, Ashirvad strives to bring the latest technology and products into the Indian plumbing market, with more and more satisfied customers each day.

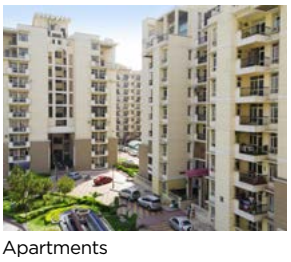
Applications of Low Noise SWR systems

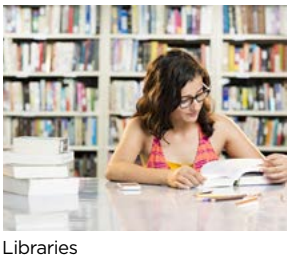
Areas of application

Ashirvad Low Noise SWR systems are designed for the evacuation of waste and rain water in down pipe sections as well as general drainage connections in buildings that place great importance on a noise–free environment for residents and users. Most common areas being

- Apartments / multi-storey buildings
- Hotels
- Hospitals / old age homes
- Public buildings / libraries
- Entertainment venues
- Restaurants
- High end villas
- Sports stadiums
- Office spaces
- Educational institutes


Hotels


Apartments


Libraries


Premium Villas

Hospitals


High end homes

Handling and Storage

Proper Handling

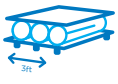
Please check and inspect the pipes on receipt. The pipes should be checked for any forms of transport damage due to shift in loads or improper handling/treatment. Visually examine the ends of pipes for any cracks or damage.

The pipes should be handled with care. The tendency to throw or drop the pipes to the floor should be avoided. Do not drag or push the pipes from a truck bed. Contact of pipes with from any sharp object should be totally avoided.

Storage of Pipes

The pipes should preferably be stored indoors. When this is not possible, please ensure to:

- Protect the pipes from sun light, to reduce the effect of UV rays.
- Store on level ground and dry surface.



- If pipes of same diameter but different classes are being stacked together, place the thicker pipes below. i.e., Stack type B below type A. If placing pipes on racks, ensure the spacing between the supports does not exceed 3 feet.

Safe handling of Solvents

When using solvent cements, primers and cleaners, there are some basic safety measures all users should keep in mind.

- After every application of solvent on the pipe / fitting ensure to put the lid back on the solvent cement containers and tighten the lid slightly to avoid evaporation and escape of solvent.

- Avoid prolonged breathing of solvent vapours. When pipe and fittings are being joined in enclosed areas, please ensure sufficient ventilation.
- Keep the cements, primers and cleaners away from all sources of ignition, heat, sparks and open flame.

- Keep containers of cements, primers and cleaners tightly closed except when the product is being used.

- Dispose of all rags used with solvents in a proper outdoor waste bin.
- Avoid eye and skin contact. In case of eye contact, flush with plenty of water for 15 minutes and call a doctor.

Correct Transportation procedure

Where possible use a truck for deliveries.
Lay pipe flat on the tray.

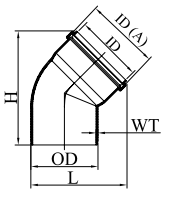
Alternate socket and pipe ends when loading pipe.

Keep pipe strapped down so it doesn't roll around and remains supported.

Ashirvad Finished Goods Handling

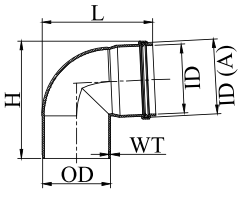
Pushfit silent SWR Fittings – Technical details

BEND 45°



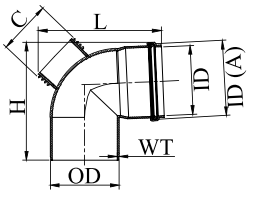
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	3.2	157	124
3	90	91	100.4	90	3.2	185	142
4	110	111.5	121.2	110	3.3	192.9	160.6
6	160	161.5	174.9	160	4.1	265.3	225.2
8	200	201.8	217.0	200	5.0	331.3	279.9

PLAIN BEND



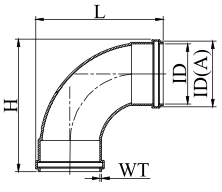
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	3.2	145	137
3	90	91	100.4	90	3.2	169	164
4	110	111.5	121.2	110	3.3	185.3	178.1
6	160	161.5	174.9	160	4.1	261.4	248.1
8	200	201.8	217.0	200	5.0	326.9	308.2

DOOR BEND



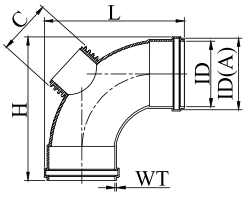
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	3.2	152	151	75
3	90	91	100.4	90	3.2	175	177	90
4	110	111.5	121.2	110	3.3	185.3	206	110
6	160	161.5	174.9	160	4.1	261.4	270	110
8	200	201.8	217.0	200	5.0	326.9	322	160

LONG SWEPT BEND



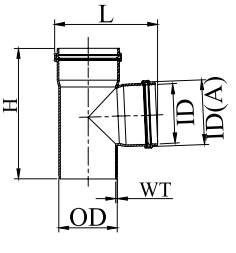
Size (in)	Size (mm)	ID	ID(A)	WT	H	L
4	110	111.5	121.2	3.0	230.3	226.2
6	160	161.5	174.9	3.7	323.3	317.45
8	200	201.8	217.0	4.5	404.6	397.3

LONG SWEPT BEND WITH DOOR



Size (in)	Size (mm)	ID	ID(A)	WT	H	L	C
4	110	111.5	121.2	3.0	230.3	226.2	110
6	160	161.5	174.9	3.7	323.3	317.5	110
8	200	201.8	217	4.5	404.6	397.3	160

SINGLE TEE



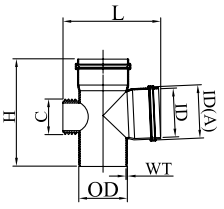
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	3.2	194	138
3	90	91	100.4	90	3.2	228	164
4	110	111.5	121.2	110	3.3	240	189.5
6	160	161.5	174.9	160	4.1	333.2	264.3
8	200	201.8	217.0	200	5.0	416	327.6

The following notation (symbols) shall apply in this reference manual.

ID - Inner Diameter
ID(A) - 'O' Ring Groove Diameter
OD - Outer Diameter
WT - Wall Thickness

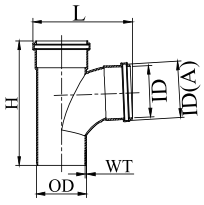
SL - Socket Length
H - Height
L - Length
C - Door Cap Size

DOOR TEE



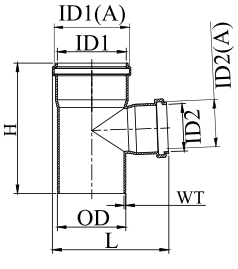
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	3.2	194	163	75
3	90	91	100.4	90	3.2	228	192	90
4	110	111.5	121.2	110	3.3	240	222	110
6	160	161.5	174.9	160	4.1	333.2	301	110
8	200	201.8	217.0	200	5.0	416	315	160

LONG SWEPT TEE



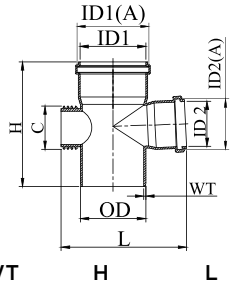
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
4	110	111.5	121.2	110	3.3	284.1	223.6
6	160	161.5	174.9	160	4.1	397.3	314
8	200	201.8	217.0	200	5.0	497.3	393

REDUCING TEE



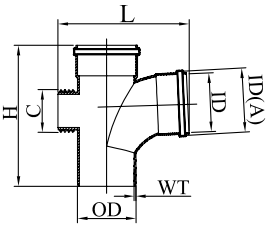
Size (in)	Size (mm)	ID1	ID2	ID1 (A)	ID2 (A)	OD	WT	H	L
3 x 2½	90 x 75	91	76	100.4	84.8	90	3.2	228	158
4 x 2½	110 x 75	111.5	76	121.2	84.8	110	3.2	262	181
6 x 4	160 x 110	161.5	111.5	174.9	121.2	160	4.1	286.1	245

REDUCING TEE WITH DOOR



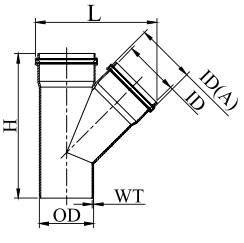
Size (in)	Size (mm)	ID1	ID2	ID1 (A)	ID2 (A)	OD	WT	H	L	C
3 x 2½	90 x 75	91	76	100.4	84.8	90	3.2	228	189	90
4 x 2½	110 x 75	111.5	76	121.2	84.8	110	3.2	262	210	110
6 x 4	160 x 110	161.5	111.5	174.9	121.2	160	4.1	286.1	277	110

LONG SWEPT TEE WITH DOOR



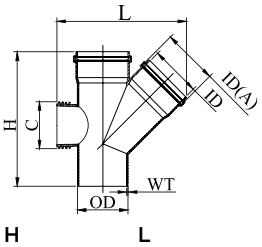
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
4	110	111.5	121.2	110	3.3	284.1	245	110
6	160	161.5	174.9	160	4.1	397.3	335	110
8	200	201.8	217	200	5.0	497.3	420	160

SINGLE 'Y'



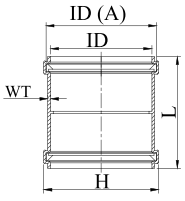
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	3.2	220	174
3	90	91	100.4	90	3.2	261	206
4	110	111.5	121.2	110	3.3	281	242.4
6	160	161.5	174.9	160	4.1	393.7	344.2
8	200	201.8	217.0	200	5.0	491.3	427.4

SINGLE 'Y' WITH DOOR



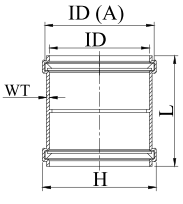
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	3.2	220	191	75
3	90	91	100.4	90	3.2	261	225	90
4	110	111.5	121.2	110	3.3	281	267	110
6	160	161.5	174.9	160	4.1	393.7	370	110
8	200	201.8	217.0	200	5.0	491.3	450	160

COUPLER



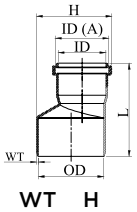
Size (in)	Size (mm)	ID	ID(A)	WT	H	L
2½	75	76	84.8	2.5	90	109
3	90	91	100.4	3.0	106	131
4	110	111.5	121.2	3.0	127.5	127
6	160	161.5	174.9	3.7	182.5	163.6
8	200	201.8	217.0	4.5	226	197

REPAIR COUPLER



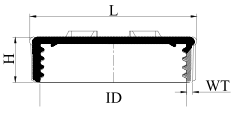
Size (in)	Size (mm)	ID	ID(A)	WT	H	L
2½	75	76	84.8	2.5	90	109
3	90	91	100.4	3.0	106	131
4	110	111.5	121.2	3.0	127.5	127
6	160	161.5	174.9	3.7	182.5	163.6
8	200	201.8	217.0	4.5	226	197

REDUCER COUPLER



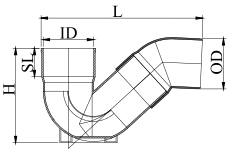
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
3 x 2 ½	90 x 75	76	84.8	90	3.2	90	133
4 x 2 ½	110 x 75	76	84.8	110	3.3	117	150
6 x 4	160 x 110	111.5	121.2	160	4.1	187	168
8 x 6	200 x 160	161.5	174.9	200	5.0	214	210.3

DOOR CAP



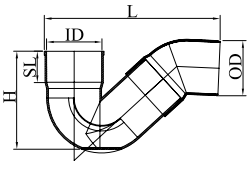
Size (in)	Size (mm)	ID	WT	H	L
1½	50	47.5	2.62	19	56
2	63	57	2.32	22	65
2½	75	72.5	3.2	25	79
3	90	84.5	3.2	24	93
4	110	101	3.2	28	110
6	160	134.5	3.2	30.5	145

P - TRAP WITH LEG



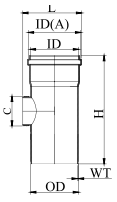
Size (in)	Size (mm)	ID	OD	SL	H	L
3 x 3	90X90	90.5	90	52	187	300
4 x 4	110X110	110.5	110	62	230	345
4 x 4½	110X125	125.5	110	69	242	360

P - TRAP WITH OUT LEG



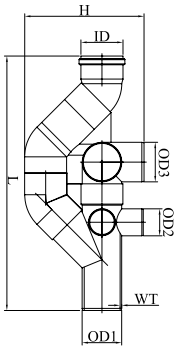
Size (in)	Size (mm)	ID	OD	SL	H	L
3 x 3	90X90	90.5	90	52	187	300
4 x 4	110X110	110.5	110	62	227.5	345
4 x 4½	110X125	125.5	110	69	242	360

CLEANING PIPE



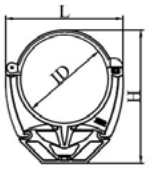
Size (in)	Size (mm)	ID	ID (A)	OD	WT	C	H	L
2½	75	76	84.8	75	3.2	75	193	100
3	90	91	100.4	90	3.2	90	228	118
4	110	111.5	121.2	110	3.3	110	261.5	140.3
6	160	161.5	174.9	160	4.1	110	362.5	183.5

SINGLE STACK SILENT SWR



Size (in)	Size (mm)	ID	OD1	OD2	OD3	WT	H	L
4	110	111.5	110	75	110	3.3	332	708

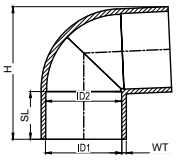
'GIRPI' BRACKET



Size (in)	Size (mm)	ID	H	L
1¼	40	40.3	75.6	66.44
1½	50	50.4	85.4	78.4
2	63	63.5	98.2	93.1
2½	75	76.3	138.4	110.5
3	90	91	127.0	130.7
4	110	111.5	167.5	149.2
6	160	161.5	232.0	213.2
8	200	201.8	302.5	268.0

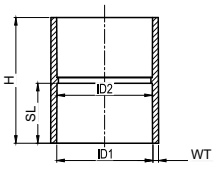
Solfit silent SWR Fittings – Technical details

EQUAL ELBOW



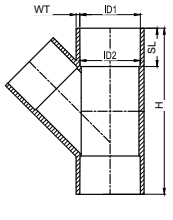
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
1¼	40	40.3	40.1	26.0	2.9	70.6
1½	50	50.3	50.0	31.5	2.9	85.05
2	63	63.4	63.0	37.5	3.0	108
2½	75	75.40	75.0	44.5	3.0	123.7
3	90	90.41	90.1	51.5	3.05	146

COUPLER



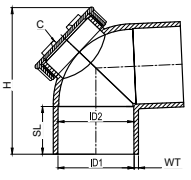
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
1¼	40	40.3	40.1	26.0	2.9	55.2
1½	50	50.3	50.0	31.5	2.9	65
2	63	63.4	63.0	37.5	3.0	80
2½	75	75.40	75.0	44.5	3.0	85
3	90	90.41	90.1	51.5	3.05	98

SINGLE 'Y'



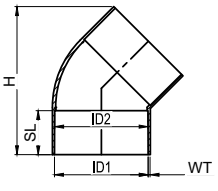
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
2½	75	75.40	75.0	44.5	3.0	207.6
3	90	90.41	90.1	51.5	3.05	251

EQUAL ELBOW WITH DOOR



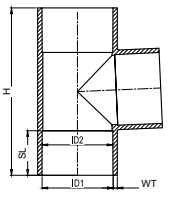
Size (in)	Size (mm)	ID1	ID2	SL	WT	H	C
2	63	63.4	63.0	37.5	3.0	108	63

EQUAL BEND 45°



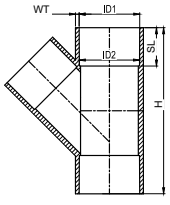
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
1¼	40	40.3	40.1	26.0	2.9	79.4
1½	50	50.3	50.0	31.5	2.9	96.0
2	63	63.4	63.0	37.5	3.0	117.1
2½	75	75.40	75.0	44.5	3.0	133.7
3	90	90.41	90.1	51.5	3.0	156.3

EQUAL TEE



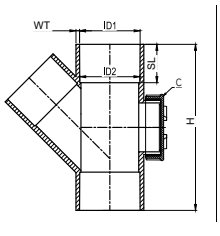
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
1¼	40	40.3	40.1	26.0	2.9	95.2
1½	50	50.3	50.0	31.5	2.9	120
2	63	63.4	63.0	37.5	3.0	144
2½	75	75.40	75.0	44.5	3.0	165
3	90	90.41	90.1	51.5	3.05	195

EQUAL 'Y'



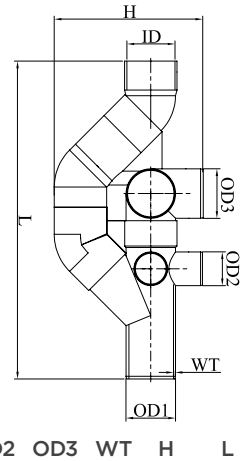
Size (in)	Size (mm)	ID1	ID2	SL	WT	H
1¼	40	40.3	40.1	26.0	2.9	113
1½	50	50.3	50.0	31.5	2.9	138
2	63	63.1	63.0	37.5	3.0	170

EQUAL 'Y' WITH DOOR



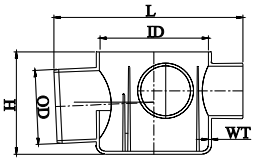
Size (in)	Size (mm)	ID1	ID2	SL	WT	H	C
1½	50	50.3	50.0	31.5	2.9	138	50
2	63	63.4	63.0	37.5	3.0	170	63

SINGLE STACK SILENT SWR



Size (in)	Size (mm)	ID	OD1	OD2	OD3	WT	H	L
4	110	111.5	110	75	110	3.3	332	708

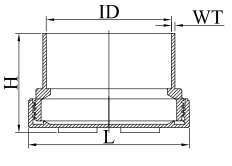
MULTI TRAP WITHOUT JALI



Size (in)	Size (mm)	ID	Spigot OD	WT	H	L
4 (7" HT)	110	110.4	75.17	3.2	178	211

Common fittings for silent / silent plus

THREADED END PLUG



Size (in)	Size (mm)	ID	WT	H	L
2	63	63.5	3.0	71.85	79.6
2½	75	76.3	3.0	73.75	93.5
3	90	91	3.2	83	110.1
4	110	111.5	3.3	88	145.3
6	160	161.5	4.1	106	175

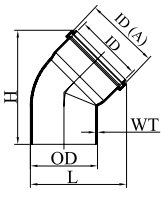
The following notation (symbols) shall apply in this reference manual.

ID - Inner Diameter
ID(A) - 'O' Ring Groove Diameter
OD - Outer Diameter
WT - Wall Thickness

SL - Socket Length
H - Height
L - Length
C - Door Cap Size

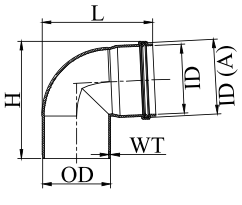
Pushfit silent plus SWR Fittings – Technical details

BEND 45°



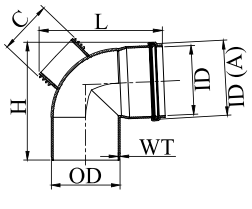
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	4.5	157.4	119.3
4	110	111.5	121.2	110	5.3	193	160.7
6	160	161.5	174.9	160	5.3	265.3	225.2
8	200	201.8	217.0	200	5.0	331.3	279.9

PLAIN BEND



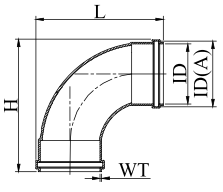
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	4.5	144.6	134.7
4	110	111.5	121.2	110	5.3	185.2	178.1
6	160	161.5	174.9	160	5.3	261.4	248.1
8	200	201.8	217.0	200	5.0	326.9	308.2

DOOR BEND



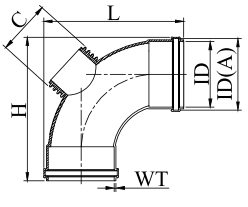
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	4.5	144.6	146.8	75
4	110	111.5	121.2	110	5.3	185.2	192.2	110
6	160	161.5	174.9	160	5.3	261.4	250.2	110
8	200	201.8	217.0	200	5.0	326.9	308.2	160

LONG SWEPT BEND



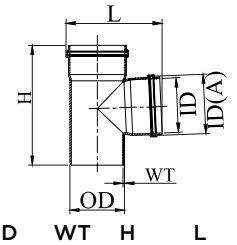
Size (in)	Size (mm)	ID	ID(A)	WT	H	L
4	110	111.5	121.2	3.0	230.3	226
6	160	161.5	174.9	3.7	323.3	317.6
8	200	201.8	217	4.5	404.6	284.3

LONG SWEPT BEND WITH DOOR



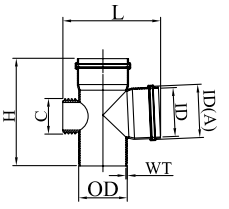
Size (in)	Size (mm)	ID	ID(A)	WT	H	L	C
4	110	111.5	121.2	3.0	230.3	226	110
6	160	161.5	174.9	3.7	323.3	317.6	110
8	200	201.8	217	4.5	404.6	284.3	160

SINGLE TEE



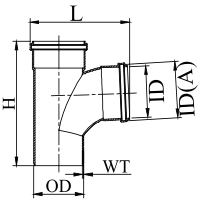
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	4.5	192.5	143.2
4	110	111.5	121.2	110	5.3	240	189.5
6	160	161.5	174.9	160	5.3	169.6	264.2
8	200	201.8	217.0	200	5.0	416	327.4

DOOR TEE



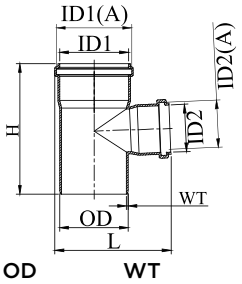
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	4.5	192.5	161.2	75
4	110	111.5	121.2	110	5.3	240	206.8	110
6	160	161.5	174.9	160	5.3	169.6	279.1	110
8	200	201.8	217.0	200	5.0	416	345	160

LONG SWEPT TEE



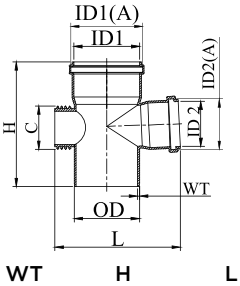
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
4	110	111.5	121.2	110	5.3	284.1	226.1
6	160	161.5	174.9	160	5.3	397.3	317.6
8	200	201.8	217	200	5.0	497.3	397.3

REDUCING TEE



Size (inch)	Size (mm)	ID1	ID2	ID1 (A)	ID2 (A)	OD	WT	H	L
4 x 2½	110 x 75	111.5	76	121.2	84.8	110	5.3	261	182.6
6 x 4	160 x 110	161.5	111.5	174.9	121.2	160	5.3	286.1	245

REDUCING SINGLE TEE WITH DOOR



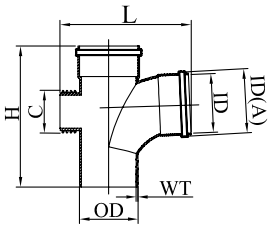
Size (inch)	Size (mm)	ID1	ID2	ID1 (A)	ID2 (A)	OD	WT	H	L	C
4 x 2½	110 x 75	111.5	76	121.2	84.8	110	5.3	261	204	110
6 x 4	160 x 110	161.5	111.5	174.9	121.2	160	5.3	286.1	259.8	110

The following notation (symbols) shall apply in this reference manual.

ID - Inner Diameter
ID(A) - 'O' Ring Groove Diameter
OD - Outer Diameter
WT - Wall Thickness

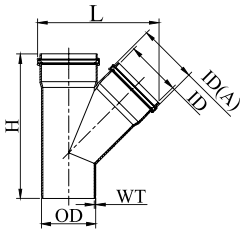
SL - Socket Length
H - Height
L - Length
C - Door Cap Size

LONG SWEPT TEE WITH DOOR



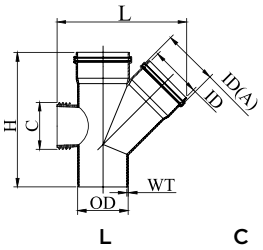
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
4	110	111.5	121.2	110	5.3	284.1	243.4	110
6	160	161.5	174.9	160	5.3	397.3	332.3	110
8	200	201.8	217	200	5.0	497.3	414.9	160

SINGLE 'Y'



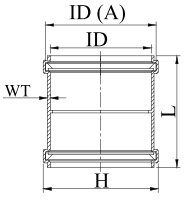
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
2½	75	76	84.8	75	4.5	219.6	175.4
4	110	111.5	121.2	110	5.3	280.9	242.4
6	160	161.5	174.9	160	5.3	393.7	344.2
8	200	201.8	217	200	5.0	491.3	427.4

SINGLE 'Y' WITH DOOR



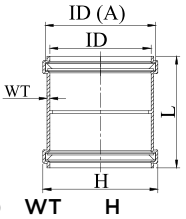
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L	C
2½	75	76	84.8	75	4.5	219.6	191.1	75
4	110	111.5	121.2	110	5.3	280.9	259.6	110
6	160	161.5	174.9	160	5.3	393.7	358.8	110
8	200	201.8	217	200	5.0	491.3	445.6	160

COUPLER



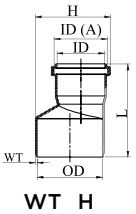
Size (inch)	Size (mm)	ID	ID(A)	WT	H	L
2½	75	76	84.8	2.5	89.8	108.5
4	110	111.5	121.2	3.0	127.5	127.0
6	160	161.5	174.9	3.7	182.5	163.6
8	200	201.8	217	4.5	226	187

REPAIR COUPLER



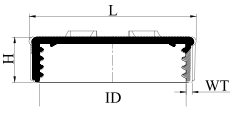
Size (inch)	Size (mm)	ID	ID(A)	WT	H	L
2½	75	76	84.8	2.5	89.8	108.5
4	110	111.5	121.2	3.0	127.5	127.0
6	160	161.5	174.9	3.7	182.5	163.6
8	200	201.8	217	4.5	226	187

REDUCER COUPLER



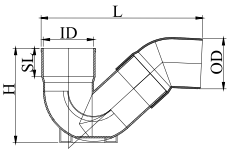
Size (in)	Size (mm)	ID	ID(A)	OD	WT	H	L
4 x 2½	110 x 75	76	84.8	110	5.3	139.9	117.4
6 x 4	160 x 110	111.5	121.2	160	5.3	187	168.1
8 x 6	200 x 160	161.5	174.9	200	5.0	214	210.3

DOOR CAP



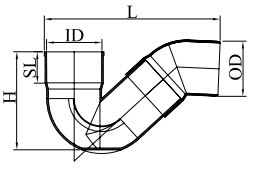
Size (inch)	Size (mm)	ID	WT	H	L
2½	75	72.2	3.0	22.3	17.8
4	110	100.9	3.5	25.7	110.25
6	160	134.1	4.0	31	-

P - TRAP WITH LEG



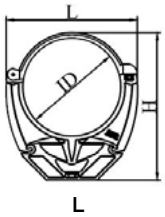
Size (in)	Size (mm)	ID	OD	SL	H	L
3 x 3	90X90	90.5	90	52	187	300
4 x 4	110X110	110.5	110	62	230	345
4 x 4½	110X125	125.5	110	69	242	360

P - TRAP WITH OUT LEG



Size (in)	Size (mm)	ID	OD	SL	H	L
3 x 3	90X90	90.5	90	52	187	300
4 x 4	110X110	110.5	110	62	227.5	345
4 x 4½	110X125	125.5	110	69	242	360

BRACKET



Size (in)	Size (mm)	ID	H	L
1¼	40	40.3	75.6	66.44
1½	50	50.4	85.4	78.4
2	63	63.5	98.2	93.1
2½	75	76.3	138.4	110.5
3	90	91	127.0	130.7
4	110	111.5	167.5	149.2
6	160	161.5	232.0	213.2
8	200	201.8	302.5	268.0

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The following notation (symbols) shall apply in this reference manual.

ID - Inner Diameter
ID(A) - 'O' Ring Groove Diameter
OD - Outer Diameter
WT - Wall Thickness

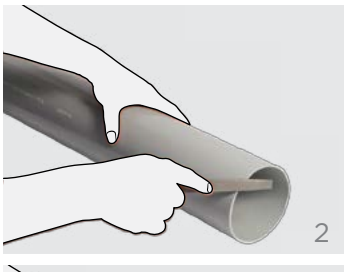
SL - Socket Length
H - Height
L - Length
C - Door Cap Size

Installation Guide for Pushfit

Easy and 100% leakproof installation.

Step 1: Cutting

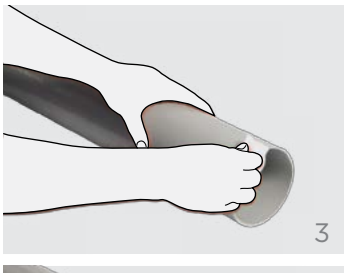
Measure and cut pipe to size. Ensure to cut the pipes straight and square. Inspect pipe ends thoroughly before making the cut, if any cracks or split in the ring is noticed cut off a minimum of 25 mm beyond the visible crack before proceeding.



Step 2: Chamfering and Deburring

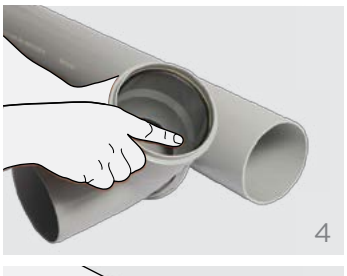
Burrs in and on pipe end can obstruct flow/proper contact between the pipe and socket of the fitting during assembly and should be removed from both in and outside of the pipe. A 15 mm dia half round file/a pen knife or a Deburring tool are suitable for this purpose.

A slight bevel on the end of the pipe will ease entry of the pipe into the socket of the fitting socket.



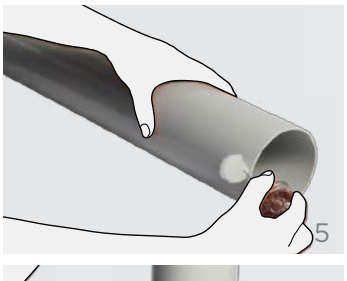
Step 3: Fitting Preparation

Use a clean dry cloth to wipe the dirt, moisture from the fitting and pipe end.



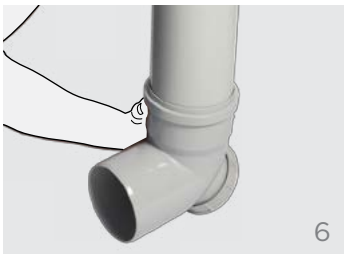
Step 4: Check for Blue Seal™

Check the socket end for Blue Seal™. Ensure that the Blue part of the seal is towards the outside of socket.



Step 5: Lubricant

Apply the lubricant on the chamfered end of the pipe.



Step 6: Assembly

Immediately insert the pipe into the fitting socket. Rotate the pipe slightly while inserting. Withdraw pipe until the mark is 12 mm away from socket. This means a 12 mm gap exists between the end of the pipe and the socket register. This gap will allow the pipe to expand without distorting the pipe-work jointing.

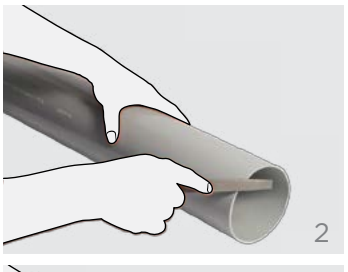
ASHIRVAD Low Noise Pushfit Pipes and Fittings are joined with the help of Ashirvad SWR Lubricant. For faster plumbing and leak proof joints we strongly recommend the use of Ashirvad lubricants only.

Installation Guide for Solfit

Easy and 100% leakproof installation.

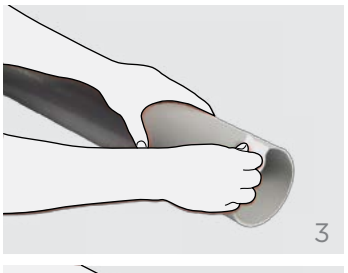
Step 1: Cutting

Measure the pipe length accurately and make a visible marking using a felt tip pen. Ensure that the pipe and fittings are size compatible. You can easily cut with a plywood cutting saw/ ratchet cutter or a wheel cutter. Cutting the pipe as squarely as possible (at 90°) provides optimal bonding area within a joint. Inspect pipe ends thoroughly prior to making a joint. If a crack or splintering is noticed cut-off a minimum of 25 mm beyond the visible crack before proceeding.



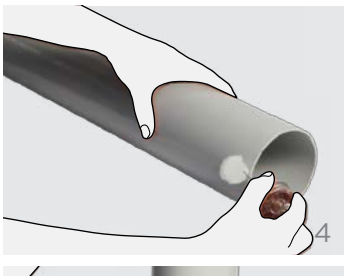
Step 2: Deburring/Bevelling

Burrs in and on pipe end can obstruct flow/proper contact between the pipe and socket of the fitting during assembly and should be removed from both in and outside of the pipe. A 15 mm dia half round file/a pen knife or a deburring tool are suitable for this purpose. A slight bevel on the end of the pipe will ease entry of the pipe into the socket of the fitting socket.



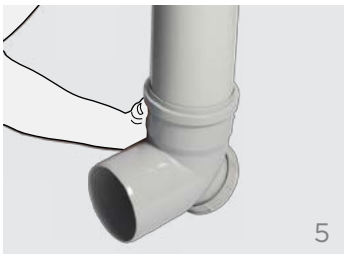
Step 3: Fitting Preparation

Using a clean dry rag, wipe the dirt and moisture from the fitting sockets and pipe end. Dry fit the pipe to ensure total entry into the bottom of the fittings socket and make a visible marking using a felt ip pen.



Step 4: Solvent Cement Application

Apply an even coat of solvent cement on the pipe and the socket end of the fitting. Do not use thickened or lumpy solvent cement. It should have a flow consistency like that of syrup or paint.



Step 5: Assembly

Immediately insert the pipe into the fitting socket, rotate the pipe ¼ to ½ turn while inserting. This motion ensures an even distribution of cement within the joint. Hold the assembly for 10 seconds to allow the joint to setup.

ASHIRVAD Low Noise Solfit Pipes and Fittings are joined with the help of Ashirvad SWR solvent cement, which is a single step fast setting solvent cement. The bonding takes place due to chemical fusion of the mating surfaces.

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Installation Guide for Pipe Brackets

Step 1

Drill a hole into the wall of suitable diameter depending on the size of the clamp.

Step 2

Place the plastic plug provided into the drilled hole for easier fixing of the anchoring bolt.

Step 3

Fix the anchoring bolt into the plastic plug by rotating carefully with the help of spanner. Make sure it is rigidly fixed.

Step 4

Rotate the Pipe bracket onto the anchor bolt and make sure the bracket is rigidly fixed.

Step 5

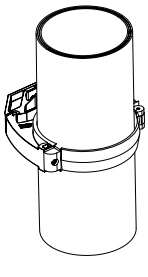
Once the bracket is rigidly fixed, unscrew the pipe clip and place the pipe into the bracket.

Step 6

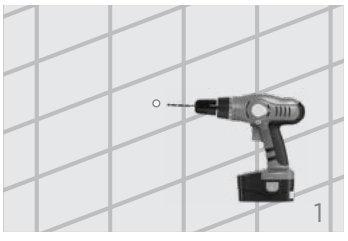
Fix the screw tightly and ensure the pipe clip is rigidly fixed to the bracket.

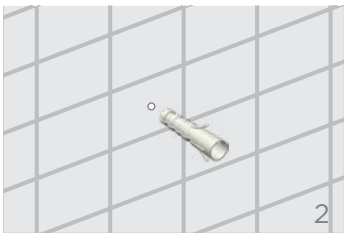
Step 7

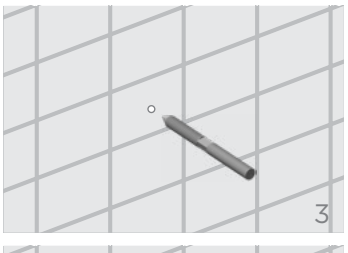
Completed installation.

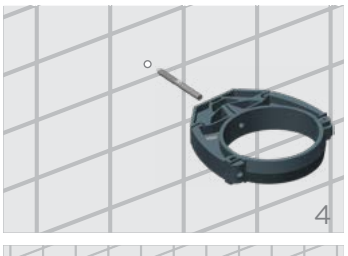


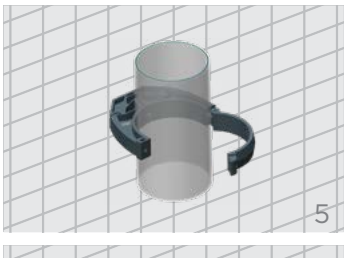
During installation please take care to ensure that there is no contact made at the locations mentioned in the image (above left).

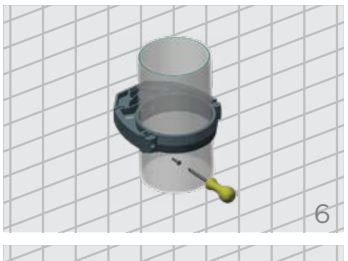


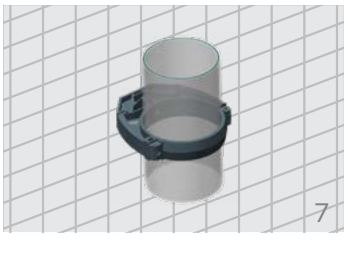




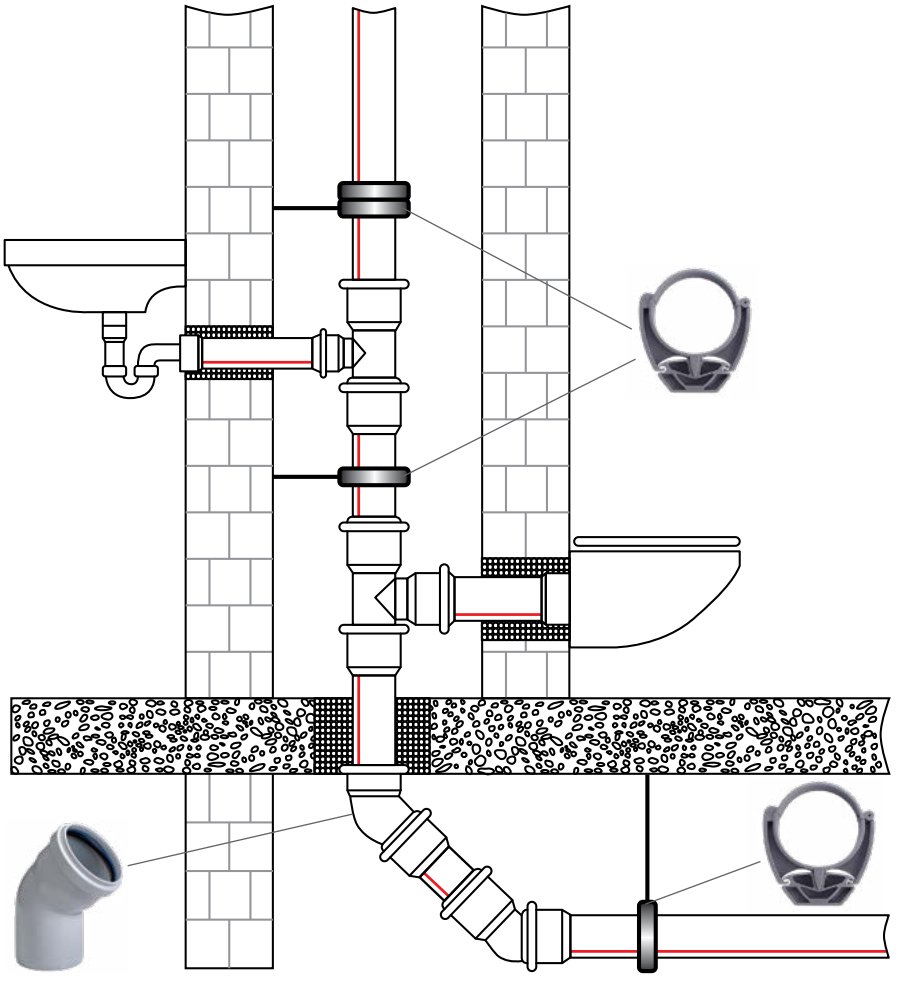








Arrangement of Pipe Brackets



- The distance between the pipe clamps in the case of horizontal piping is approximate.
- 10x the exterior pipe diameter.
- In the case of vertical installation the distance between clamps should be 1-2 metres, however, 2 metres should not be exceeded.
- If possible, do not install pipe clamps directly at the zones of impact.
- Fixed clamps are fixed points in the piping system. In the case of pipes without sockets, the fixed clamp is to be placed directly above the shaped part at the bottom end of the pipe. Fittings or groups of shaped parts are always to be located as fixed points.
- In multi-storey buildings, drop pipes are to be secured against subsidence. The use of an adjustment length with a fixed clamp under the socket is recommended.

Important Note

These acoustic pipe brackets were used together with Ashirvad Low Noise SWR pipes and fittings during the test procedure of noise reduction inside the pipe line, conducted at the Fraunhofer Institute for Building Physics in Stuttgart, Germany. The use of a different type of pipe clip for the installation of the Ashirvad Low Noise SWR system will result in change to the certified noise reduction values.

Ashirvad Low Noise SWR Systems Limited Warranty

The limited warranty will not apply if

1. Ashirvad products are used in combination with any other brand/ make of pipes and fittings.
2. Ashirvad lubricant is not used for Ashirvad Low Noise SWR Pushfit systems.
3. Ashirvad SWR solvent cement is not used for Ashirvad Solfit systems.
4. The product is used for applications other than soil, waste and rain water plumbing.
5. Ashirvad's pipe brackets are not used for clamping of Low Noise SWR pipes.
6. The installation guide provided in the manual is not followed.
7. The systems are not warranted against any mechanical damage by nails, chisels, drilling etc.

Ashirvad Low Noise SWR systems limited warranty

Ashirvad Pipes Pvt. Ltd., Bengaluru warrants to the original owner that the product will be free from manufacturing defects and conform to current applicable Indian and European standards under normal use. Buyers' remedy for breach of this warranty is limited to replacement of, or credit for, the defective product. This warranty excludes any expense for removal or reinstallation of any defective product and any other incidental, consequential or punitive damages.

FOR BEST RESULTS, USE ONLY ASHIRVAD LOW NOISE PIPES, FITTINGS AND ACOUSTIC GIRPI BRACKET AS AN ENTIRE SYSTEM

WARRANTY APPLICABLE ONLY IF ASHIRVAD PIPES, FITTINGS & SOLVENT CEMENT OR LUBRICANT ARE USED

Why Ashirvad Low Noise SWR?

Ashirvad Low Noise (silent and silent plus) SWR systems delivers excellent noise insulation values. Low Noise SWR system is a combination of pipes, fittings and brackets that is **specially designed to reduce the noise that accompanies during the flow of water and waste in the system.** They are made from an innovative 3 layer uPVC structure, one of the finest technologies in the plumbing world.

High perceived quality

Acoustically inherent sound insulating properties

Noise insulation of Silent SWR system is less than 13dB at 2 lps flow rate

Noise insulation of Silent Plus SWR system is less than 10dB at 2 lps flow rate

Technology from France

Abrasion resistant, smooth inner layer

Dependable leak proof joints

Highly rigid

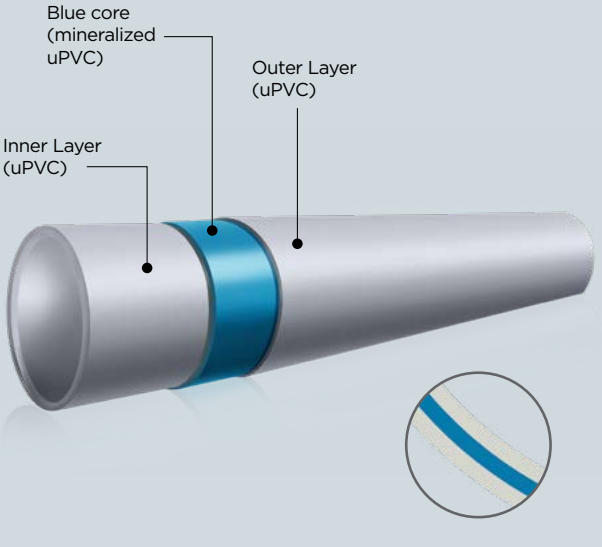
Corrosion and abrasion resistance

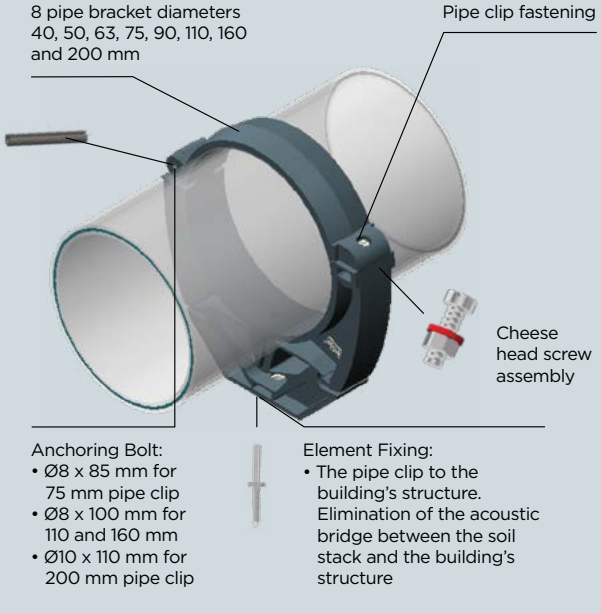
Testingby fraunhofer institute for building physics, Germany.

Blue core + Brackets

BLUE CORE: The high molecular special formula **mineralized uPVC** used in the middle layer of three layer pipe **attenuates this noise and avoids if from going out.**

Ashirvad pipe brackets are **manufactured under license from GIRPI (Aliaxis group) and is patented.** These patented pipe clamps absorb the vibrations from the pipe and reduce structural noise. They have a hinge opening and single point of fixation.





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