



Wavin Overseas
01 04132 3000
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Wavin AS

**Product and
Technical Guide**



THE LEADING SOUNDPROOF
SOIL & WASTE SYSTEM

Intelligent Solutions for

Above Ground Projects

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WAVIN AS

Professional building drainage with Wavin AS sound protection system

1. Professional building drainage with Wavin AS sound protection system

1.1 System description

Wavin AS is a sound-absorbing, hot water-resistant pipe system that is suitable for all pressureless sewage pipes according to DIN EN 12056 and DIN 1986-100.

The pipes and moulded parts are made of Astolan (mineral reinforced Polypropylene), so that general sound protection is guaranteed from the extraction positions to the manifold. Although it is conceived as a

sound-absorbing residential sewage pipe, Wavin AS is also permitted as main pipe up to the house connection duct. Ever since the new DIN EN 12056 and DIN 1986-100 sewage standards that permit the dimensions of DN 90 came into effect, it is possible to lay a complete, secure drainage system from the discharging objects (connections) up to the first cleaning opening or up to the transfer duct with just two dimensions in down-pipes – DN 56

and DN 90. Wavin AS can be delivered in the DN 56 to DN 200 dimensions. Astolan has long life, and like all plastic materials, it is corrosion-resistant and resistant to aggressive effluents. No crust formation takes place due to the smooth surface. The lesser weight in comparison with metallic pipes and the quick, safe plug-in fittings of the system make it easy to lay.

1.2 Fields of application

Wavin AS is used wherever sound protection according to DIN 4109 is required, on account of its excellent sound absorbing qualities, i.e., in hospitals, hotels, old-age homes, sanatoriums, office buildings and multi-family apartments. There are no sound protection specifications for single-family dwellings. Nevertheless, more and more people have started attaching importance to silence and recreation. Solid external walls and soundproof windows keep the noise out. However, one often forgets that noise penetrates not only from the outside, it can also originate inside. Living comfort is guaranteed with the Wavin AS sound-absorbing pipe system.

The system is designed for professional wastewater installations in (multiple storey) buildings and can be installed in the following fields of application:

- Single waste or drain pipes
- Collector pipes
- Stack pipes
- Ventilation pipes
- Rain stack pipes
- Underground pipes up to inspection chamber / manhole

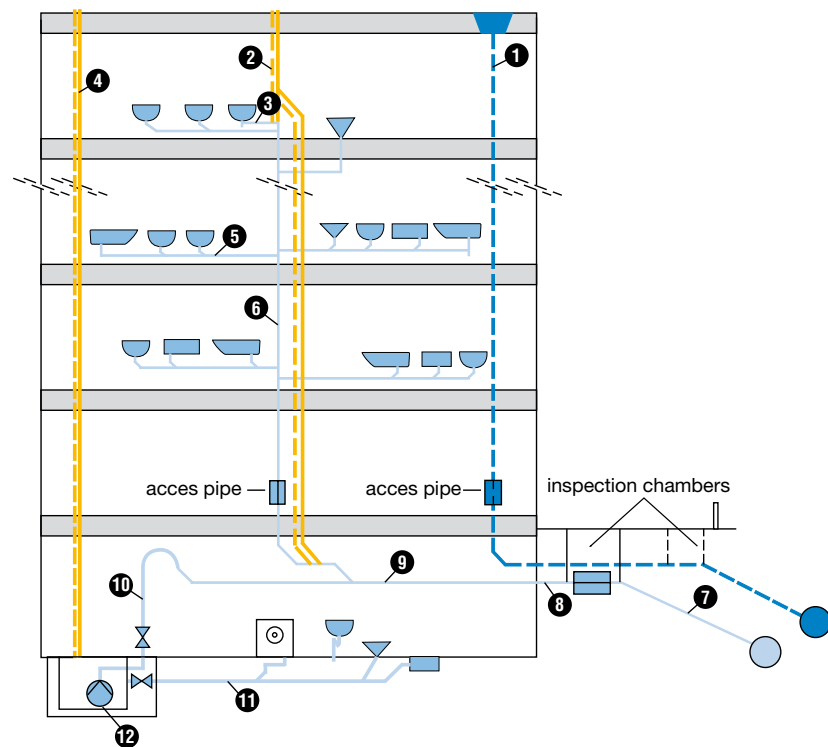


Figure 1 Examples of waste and ventilation pipes

Examples

1. Rain stack pipe
2. Main ventilation
3. Single drain / waste pipe
4. Vents of collector pump cellars
5. Collector pipe
6. Stack pipe for waste water
7. Connecting sewer pipe (PVC-U)
8. Soil pipe
9. Collector pipe
10. Rising sewer pipe (PVC-U)
11. Underground collector pipeline
12. Faecal collection (cellar) pit

Wavin AS is resistant to hot water and fulfils the requirements of DIN 1986, which means 95°C short term and 90°C long term temperature loading. Wavin AS can be used for the drainage of wastewater between pH 2 and pH 12, eg in professional kitchens up to the house connection duct.



1.3 Quality assurance and approvals

Rigorous testing and quality control throughout the entire production process ensures that Wavin AS pipes and fittings together build a highly reliable and extremely effective low noise system. They have the RAL – quality mark of the German Community of Plastic Pipes (GKR), Bonn. They have a general building inspection approval with the approval number Z.-42.1-228 of the German Institute for Building (DIBt). This allows Wavin AS also to be used as main pipeline for underground installations.



1.3.1. Worldwide certificates and approvals

Denmark: ETA Denmark VA

2.14 DK 6858

Norway: Godkjenningsnr mnda

vor Sanitærmateriell Nr. 61-090

Sweden: Boverket

DNR 83-4480/90

Australia: Watermark

Nr.: MP52 Spec 005

Germany: DIBt, Z.-42.1-228

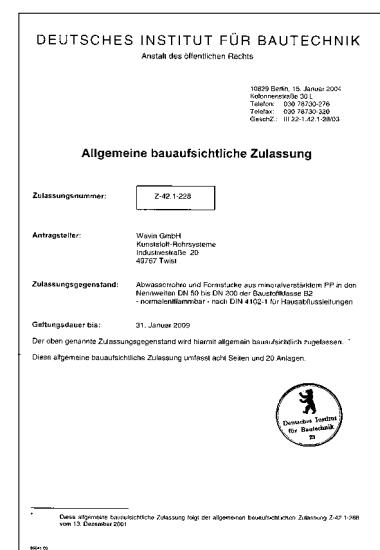
Turkey: Turkish Standards

Quality Appropriateness Certificate

Poland: Aprobata techniczna

COBRTI INSTAL

Nr AT-99-02-0670



WAVIN AS

Professional building drainage with Wavin AS sound protection system

1.4. Sound protection properties

The excellent sound protection properties of Wavin AS can be attributed primarily to its thick-walled design as well as special molecular structure and the high density of 1.9 g/cm³ of the Astolan pipe and moulded parts. This property enables Wavin AS to absorb air as well as

mechanical vibrations. In studies conducted at the Fraunhofer Institut für Bauphysik (Fraunhofer Institute for Building Physics), Stuttgart, Wavin AS has proven its excellent sound absorption properties under near-real installation conditions (P-BA 130/1997).

A contribution to sound protection is also made by the compensator socket that functions as the control connector between Wavin pipes. At a maximum of every 3m it isolates the sewage pipe from the following system (mechanical vibration isolation).

1.5 Technical Data

Material:

Astolan®; polypropylene, mineral reinforced, resistant to hot water, DIN 4102, B2.

Coefficient of thermal

linear expansion ~ 0,09 mm/mK

Fire resistancy ~ DIN 4102, B2

Colour Light grey RAL 7035

Physical characteristics:

Density ~ 1,9 g/cm³ DIN 53479

Elongation at break ~ 29%

Tensile strength ~ 13 N/mm²

E-modulus ~ 3800 N/mm²

Marking:

Wavin AS, nominal diameter, production year, quality mark, approval, material, control mark, fire classification.

Example:

Wavin AS, DN 100, 2002, Z.-42.1-228, ASTOLAN®, Ü DIN 4102, B2.



2. The complete solution in fire protection

2.1 Fire Protection

In exceptional cases where fire protecting measures are necessary, the Wavin AS Fire Protection Collar (Type NE/compact) is the integral solution in the Wavin AS System.

The fireproof blowing material inside the collar creates a mechanical pipe seal. Thus preventing fire transmission and providing a smoke tight lock for at least 90 minutes.

2.2 Characteristics Type NE / Compact

- For fire isolation, of minimal 90 minutes, in Wavin AS systems crossing walls and floors (fire protection classification F90, according to DIN 4102-part 11)
- For installation afterwards at walls and ceilings
- Optimally attuned to Wavin AS, as part of the low noise soil & waste system
- Approved by the German Institute for Building (Approval nr.: Z-19.17-1390)
- Small and compact – only 3cm high for DN 100 mm
- Only three articles cover the range from DN 56 to DN 150 mm
- Easy, Quick and Safe installation

2.3 Installation of the NE / Compact fire protection sleeve

The Wavin AS sound protection pipe can be insulated to prevent sound transmission in the areas where piping is executed through walls or ceilings. AF/Armaflex (Armacell GmbH) or mineral wool (Building Materials Class DIN 4102-A, Melting Point > 1000°C) is ideal in a maximum thickness of 15 mm in case of piping executed in ceilings. Only mineral wool should be used in pipes installed in walls.

Two fire protection sleeves (one sleeve on each side of the wall) are required to partition pipes in walls; for ceiling executions, one fire protection sleeve (on the lower side of the ceiling) is sufficient.

The intermediate space between the insulated plastic pipe in the execution area and the component must be plugged. If this is not the case, the intermediate space must be filled up with commercial mortar up to the component thickness. The sleeve can be mounted after the mortar has hardened.

To install the sleeve, please proceed as follows:

The fastening straps are first bent at 90 degrees in the outward direction with the help of a flat tong. Then the sleeve is placed around the plastic pipe and mounted with the attached screw and nut. You may now push the NE/Compact fire protection sleeve against the component to mark the specified number of holes through the position of the straps on the component

The NE/Compact fire protection sleeve is displaced a little to drill the holes. After drilling the holes, the sound absorption strips included in the delivery scope are pasted on the pipe with the help of a

commercial adhesive tape in such a way that it is arranged between the sleeve and the pipe. Finally, push the NE/Compact fire protection sleeve against the wall/roof and fasten the sleeve with the recommended mounting elements on the component.

The presented data, especially recommendations for the processing and use of our products are based on our knowledge and experience. Due to differences in material and working conditions that are outside the purview of our influence, we recommend that sufficient internal trials be conducted in each case to ensure the suitability of our product to the intended method and processing purposes. No liability will be accepted either on the basis of these instructions or from an oral advice, unless we are accused of gross negligence or deliberate malice.

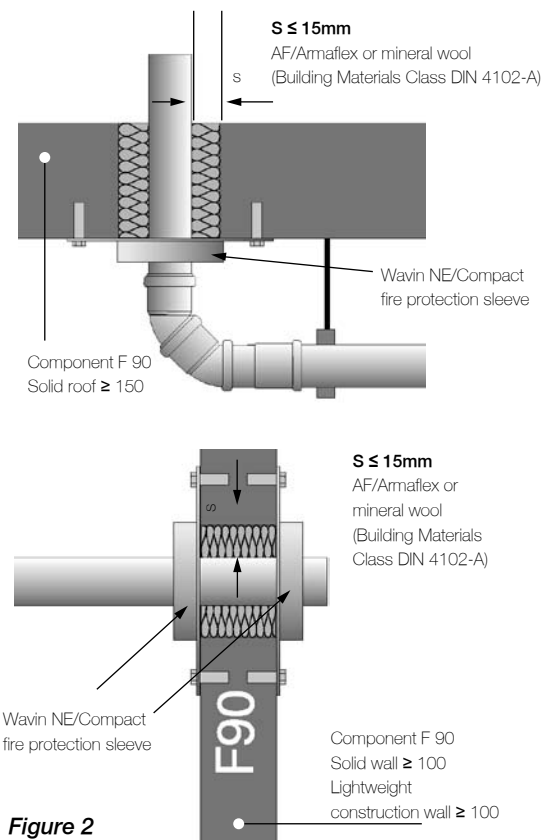


Figure 2



3. Recommendations Wavin AS

3.1 Packing, Transport and Storage

3.1.1 Packing

Wavin AS pipes and fittings are packed ready for transport in a customer friendly way. The packing guarantees optimal security, efficient storage and easy handling.

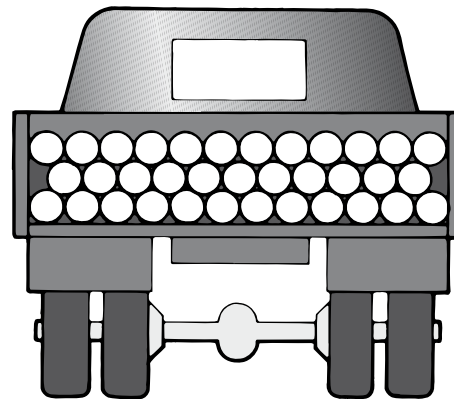
Standard delivery unit for pipes is per pallet. It contains 14 to 38 pipes depending on the pipe diameter. Due to the standardized 3 metre length of all pipes there is only one pallet type for each dimension (DN 56, DN 70, DN 100, DN 125, DN 150 and DN 200). This saves space in the warehouse. Further, Wavin offers DN 90 (wall mounting) in 2 metre length. The pallets can be handled with a forklift truck.

Wavin AS fittings are packed in practical carton box pallets.



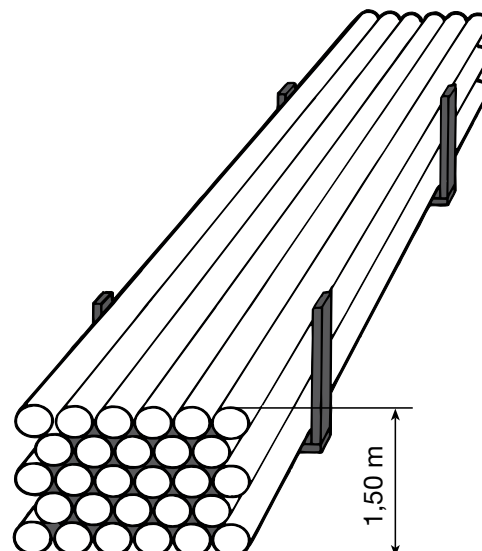
3.1.2 Transport

Wavin AS pipes – when no longer packed in original pallets – must lie fully supported over their total length during transport. Bending of the pipes should be avoided. Impact stress on pipes and fittings must be prevented.



3.1.3. Storage

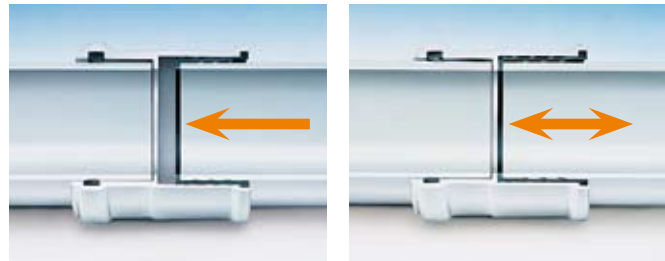
If stored correctly no lasting deformations or damage to pipes and fittings will occur. Factory bundled pipe pallets can be stacked. The stack of loose pipes should never be higher than 1,5 metre. The elastomeric sealing rings should preferably not be stored in the open air.



3.2 Jointing

3.2.1 Joints with the compensator socket

The Wavin AS compensator socket is used to connect two pipes as well as a pipe and fitting where compensation for axial movements is required. For conventional plastic soil and waste pipe systems the expansion margin is created by marking and withdrawing the pipe to the expansion length. This is not required for Wavin AS, as the compensator socket adapts to temperature changes in the system. This not only saves working time, but also gives additional technical security to the system.



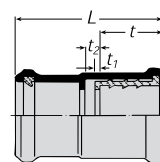
Mounting instructions

When making the connection with the compensator socket the following instruction rules should be adhered to:

- Clean pipe end.
- Check the position and condition of the elastomeric sealing ring in the groove.
Further check the condition of the elastomeric expansion collar. If necessary, clean fitting, sealing ring and collar.
- Push the expansion collar over the pipe end (1).
ATTENTION: The expansion collar may only be pushed over the plain pipe ends, never over the spigot end of fittings.
- Apply Wavin lubricant* sparsely inside compensator socket of fitting (2).
- Apply and distribute Wavin lubricant evenly on outside of elastomeric compensator collar (3).
- Push fitting over compensator collar to full insertion depth. Check final position of compensator collar** (4-6).
- Apply Wavin lubricant on the next pipe end or spigot fitting and insert in the socket end to full depth.

*) Never use oil or grease!

**) Insertion depth for pipe with collar into the compensator socket, see table 1



DN (mm)	L (mm)	t (mm)	t ₁ (mm)	t ₂ (mm)
56	126	49	5	15
70	119	48	6	16
90	123	47	6	16
100	124	48	6	16
125	132	63	6	16
150	144	63	6	16

Table 1 Insertion depth for pipe with collar in compensator

3.2.2 Joints without the compensator socket

Push-fit joints between pipes of maximum 3 metre lengths and fittings must be capable of absorbing lateral thermal expansion of up to 10 mm. In case no use is made of the compensator socket, the required lateral expansion tolerance can be created by inserting the pipe end to full depth and subsequently withdrawing the pipe end by 10 mm. (B). Socket connections between fittings only, need no consideration for lateral compensation due to temperature differences and can therefore be fully inserted.

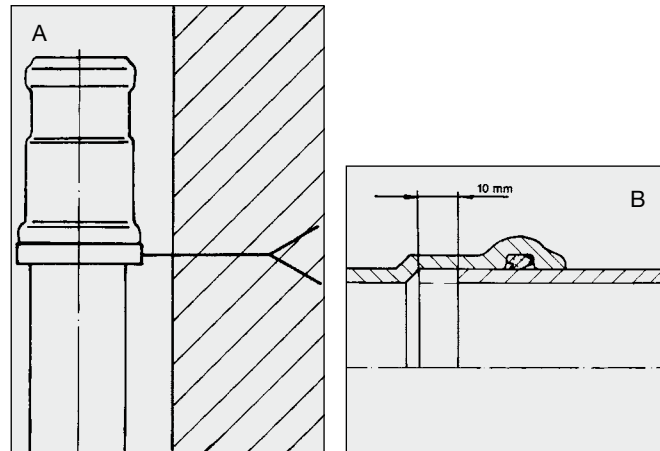


Figure 3 Joints with compensator socket (A) or alternatively with integrated socket (B)

The socket connection is to be installed as follows:

- Check the position and condition of the elastomeric sealing ring in the groove. If necessary, clean fitting and sealing ring.
- Clean pipe end or spigot fitting.

- Apply Wavin lubricant* in a thin and equal layer on pipe end.
- Insert pipe end straight to the central register of the socket.
- Withdraw pipe by 10 mm.
 - never the fitting -
- *) Never use oil or grease!

In case of vertical installation of pipes, the individual pipe lengths must be fixed immediately after assembly with pipe brackets, in order to avoid the pipe from sliding downwards and eliminating the 10 mm expansion / contraction allowance (A).

3.2.3 Making a connection on an already installed pipe

This can easily be executed using standard Wavin AS fittings.

Installation instructions using double socketed sleeves:

1. Cut out a sufficient length of pipe (length of fitting plus 2,5x OD of pipe)
2. Cut required pass length
3. Deburr and bevel cutting edges
4. Slide branch or access pipe on upper pipe end
5. Fit one double socketed sleeve, over its full length, on pass length
6. Fit one double socketed sleeve, over its full length, on lower pipe end

7. Fit in pass length and close the pipe by sliding the double socketed sleeves in position
8. Fix double socketed sleeves as pictured in figure

Alternatively Wavin compression couplers or Wavin AS long socket (only DN 100) can also be used.

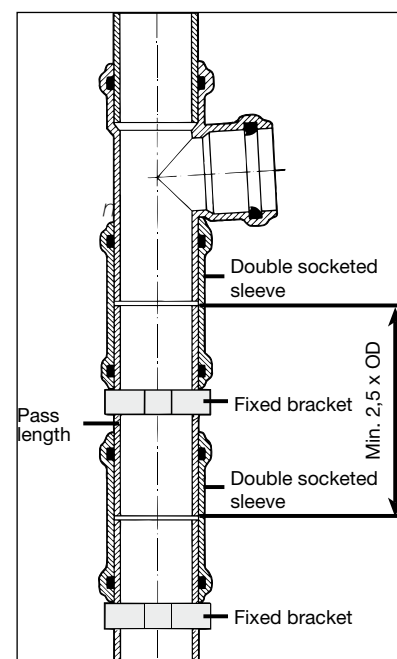


Figure 4 Connections on a ready installed pipe

3.3 Pipe cutting

Wavin AS can be cut simply with a commercial pipe cutter or saw. Always cut the pipe straight. Remove all swarf and burrs from the cut end and clean the pipe end. Bevel sharp cutting edge – do not chamfer!

For connections to socketed pipe systems with roll-rings, the ends of the Wavin AS pipes must be chamfered. (Note: Does not apply for PVC-U fittings with elastomeric sealing ring as well as PP pipes and fittings).

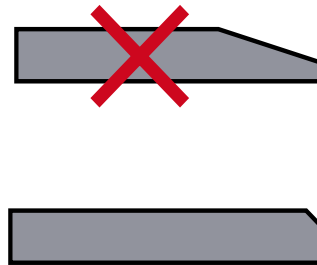


Figure 5 Cutting Wavin AS pipes



3.4 Fixing

3.4.1 General instructions

In principle Wavin AS soil and waste systems should be installed tension free and with free lateral allowance for temperature compensation. Use sound absorbing brackets, dimensionally compatible to the pipe diameter. Recommended are screw-pipe brackets with inserts of corrugated rubber, which are fixed to the wall by screws and plastic plugs*. For pipe systems in which inner-pressures can arise, the joints have to be secured to avoid them from sliding apart

and deviating from the centre axis. The Wavin safety clips prevent the joints from sliding apart. Alternatively the fixing brackets can be arranged appropriately.

**) Metal plugs can be used, but will lead to is disadvantageous sound emission.*



Figure 6



Figure 7

3.4.2 Fixing bracket

The fixed bracket creates a fixed point in the pipe system. With fixed brackets the pipe or fitting cannot be moved through the bracket after the screws are tightened (no longitudinal movement is possible). In order to prevent sliding down of the vertical stack, each individual pipe length must be secured on one point by a fixed bracket. Fittings or groups of fittings must always be shaped as fixed points. Also every horizontally installed pipe should always be fixed with one fixed bracket. All

remaining pipe brackets – in the vertical as well as in the horizontal installation – must be sliding brackets. The prescribed bracket distances should not be exceeded.

3.4.3 Sliding bracket

By using sliding brackets the pipe can still be moved through the bracket after the screws are tightened (longitudinal movement is possible once installed).



3.4.4 Arrangement of the brackets

During installation of Wavin AS pipes, the following should be considered:

- In case of horizontal installation, the pipe bracket distances 10 x the outside diameter of the pipe (see figure 9). In case of vertical pipe installation, depending on outside diameter, 1-2 metre (see figure 8).
- Generally pipe brackets should not be installed in impact areas. (eg diameter reductions and changes of directions in the system).
- Pipe brackets to be fixed to building materials with high specific area weight.
- For stack pipes in open mounting shafts and high rooms (storey height over 2,5 metres) it is advised to use one fixed bracket and one sliding bracket per pipe length.
- The fixed bracket must be installed directly above the fitting at the bottom of the pipe end. The sliding bracket must be installed at a distance of maximum of 2 metres above the fixed bracket (see figure 9).
- In multiple storey buildings (from 3 storeys and more) the stack pipes of DN 100 or bigger must be secured by additional fixing (stack pipe support) against sliding (see figure 9). In this case we advise using the Wavin AS socketed short length with a fixed bracket. Stack segments with fittings or short pipes are to be secured in such short distances with pipe brackets, that they cannot slide apart.

In exceptional cases, where connecting elements other than the compensator socket are used (eg double socketed sleeve), per maximum allowable pipe length (3 metres), one fixed bracket and one sliding bracket should be installed in line with the illustrations (see figure 8) and (see figure 9) shown on this page. The double socketed sleeves are to be fixed.

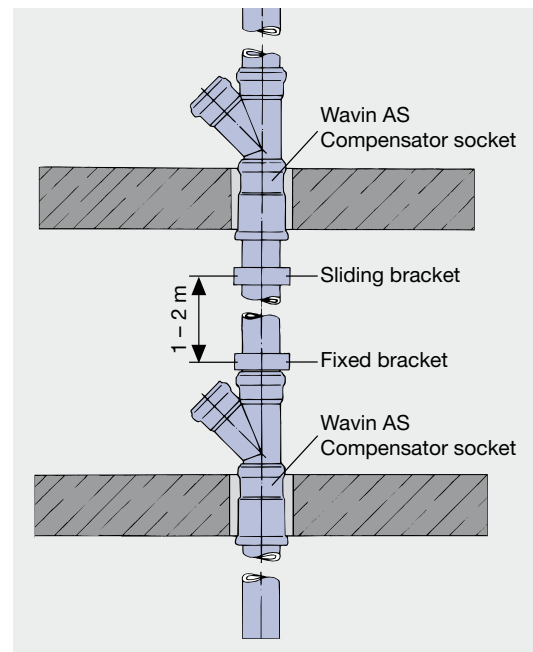


Figure 8 Fixing Wavin AS

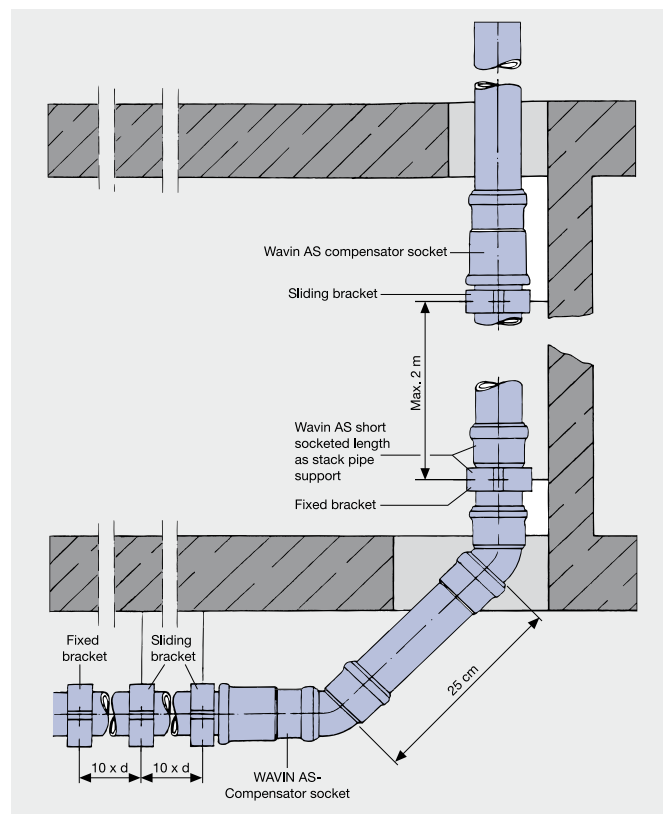


Figure 9 Fixing Wavin AS with stack pipe support

3.5 Installation in walls

In case Wavin AS is to be installed against a wall with separate decorative top layer (e.g. plaster boards), it is required that the brackets are fixed to the construction wall and not to the decorative layer. Passing holes in the decorative layer can be mended by using elastic filler. As long as stability and bearing capacity are not impaired, it is allowed to cut shafts and channels in brick work walls. External heating of Wavin AS pipes should be limited by heat insulating the source; eg central heating pipes as well as hot tap water pipes. Pipe and shaft dimensions are to be taken from table 2 below and figure 10.

DN	OD of pipe d_a	OD of socket d_m	Min. required spacing*, t_{erf}
(mm)	(mm)	(mm)	(mm)
56	58	79	125
70	78	96	142
90	90	110	156
100	110	132	179

* The stated depths are not including pipe crossings

Table 2 Space requirements for Wavin AS pipes DN 56 up to DN 100 mm

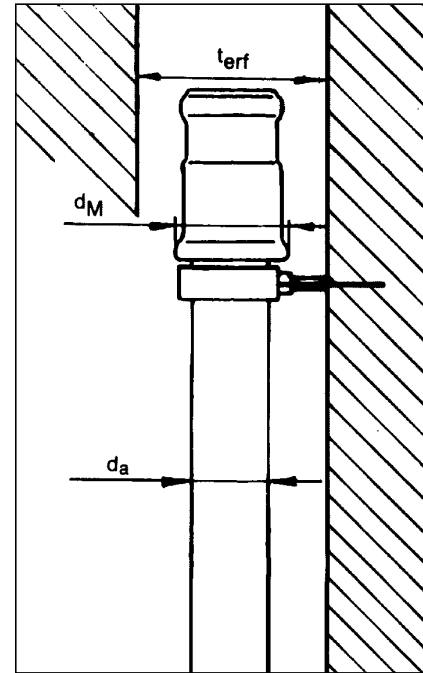


Figure 10 Space requirements Wavin AS

3.6 Installation in concrete

Wavin AS pipes and fittings can be casted in concrete. Thermal induced lateral movements to be dealt with, according to previous instructions. Pipes and fittings must be secured properly in order to prevent lateral movement during casting of the concrete. Close the annular gap between pipe and socket with sealing tape to prevent ingres of mortar in the sealing ring.

3.7 Floor crossings

Floor crossings should be made leak resistant and sound absorbent. In the case of the floor being concreted, Wavin AS pipes and fittings should be protected by using a protection sleeve or heat insulating wrapping material.

3.8 Roof drainage pipes

Roof drainage pipes projected through living, sleeping and working rooms can be installed as pictured in figure 11. The specific area weight of the casting should be at least equal to the wall and preferably for both at least 220 kg/m². Although the formation of condensation on the outside of Wavin AS pipes is less than on metallic pipes, it is recommended to insulate the pipes and fittings.

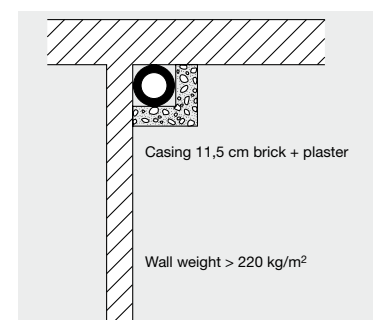


Figure 11 Internal roof drainage pipes