



**SKOLAN DB THE COMFORT PROTECTION  
AGAINST WASTE WATER NOISES**



## Sound Insulation

### THE SKOLAN dB HOUSE DISCHARGE PIPE SYSTEM – High degree of sound insulation

#### System description

Skolan dB represents a complete range available to you in DN(OD) 58 to DN(OD) 200 nominal diameter. It is suitable for all pressureless waste water pipes in acc. with DIN EN 12056 and DIN 1986-100.

Pipes and fittings consist of mineral-reinforced polypropylene and are resistant to hot water. The consistently thick-walled pipes and fittings meet the raised requirements of Sound Insulation Class III of DIN 4109 / VDI 4100.

Just as with all synthetic materials, Skolan dB is corrosion-proof, long-lasting and resistant to chemically aggressive waste water in the range of pH 2 to pH 12. The smooth inner surfaces and high degree of resistance to abrasion make sure that no deposits develop and this, in turn, ensures that the pipes can be reliably operated for a very long time.

#### Sound insulation

Tests conducted by the Fraunhofer Institut in 2010 in accordance with DIN EN 14366 confirmed the excellent sound insulation properties and the maximum Sound Insulation Class III requirements. It has been proved for many years now on the physical construction side that thick-walled pipe systems with very high molecular weight minerals have excellent sound insulation properties.

The high density of 1.6 g/cm<sup>3</sup> (+/- 0,05) contributes to the absorption of sound which is transmitted by air and conducted by solids.

#### Sources of noise in building equipment

The sources of noise in building services installations are:

- Filling noises
- Intake noises
- Noises from fittings
- Draining noises
- Impact noises

#### How does sound develop in building equipment?

The biggest problem in building equipment is where structure-borne noise is transmitted at the point of pipe fixing and where pipes are installed in walls and ceilings.

The following are the most important steps in actively furthering sound insulation:

- No sound bridges to adjacent rooms with pre-wall installation. The pre-wall installation is to be acoustically disconnected
- No exposed installation of waste water pipes on the walls of rooms to be sound insulated
- Use of low-noise fittings of Group I as per DIN 52218
- Use of walls which are suitable for installations, e.g. 220 kg/m<sup>2</sup> (large mass)
- In waste water system pipe planning, no waste water pipes are to be installed in partition walls between flats/houses

- Skolan dB pipes are to be jacketed in insulating material as conforming to the requirements of sound/heat insulation and fire protection when installed in walls and ceilings/floors
- Acoustically favourable floor plans should be drawn up so that rooms in need of sound insulation are not arranged directly next to rooms with sanitary installation-equipped walls or under bathrooms/toilets.

#### Benefits DN(OD) 90

DN(OD) 90 can now be used for collecting pipes, downpipes and pipelines. As a result, a complete discharge pipe can now be installed with only two dimensions (DN(OD) 56 and 90). DN(OD) 90 also provides other benefits such as little space needed in the supply shaft and in pre-wall installation. The smaller diameter ensures effective automatic cleaning in the pipe. A DN(OD) 90 collecting pipe can be used:

- Up to a 10 m length
- For connecting a maximum of 2 six litre flushing tanks
- For connecting a maximum of 6 sanitary items
- Given a gradient of 1 cm/m (1:100)
- With a max. 3 changes of direction of 90° or 2 x 45°



## Sound insulation in building construction

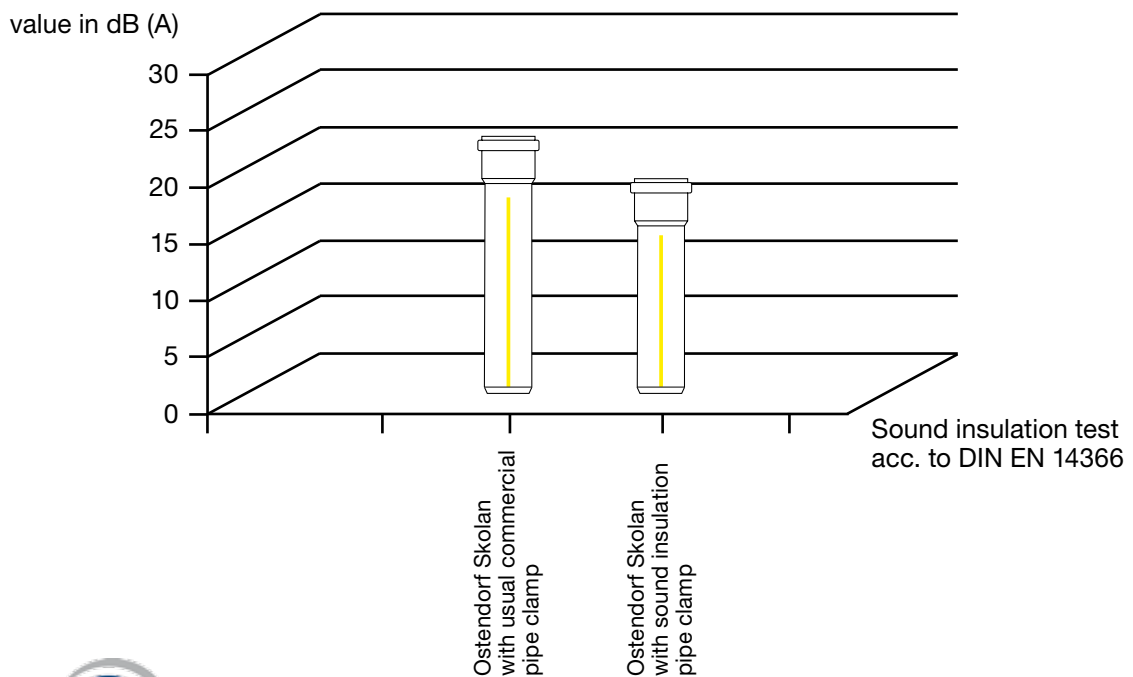
The minimum requirements for sound insulation according the building authorities are specified in the standard DIN 4109/A1.

According to DIN 4109/A1 the characteristic sound pressure level due to installation noise of sewage systems in rooms in need of protection must not be more than 30 dB (A) for living and bed rooms resp. not more than 35 dB (A) for teaching rooms and offices.

### Sound insulation advice for sanitary installations acc. to VDI

- valid for sewage systems inside buildings
- VDI 4100 specifies three different sound insulation levels

- Sound insulation level I – requirements of DIN 4109 corresponding to 30 dB (A)
- Sound insulation level II – higher sound insulation corresponding to 25 dB (A)
- Sound insulation level III – increased sound insulation corresponding to 20 dB (A)



## VDI sound insulation levels and classification



One family houses  
Sound insulation level I or on agreement



Apartment buildings, residential and office buildings, comfort appartements  
Sound insulation level II or higher



Hotels, hospitals, residential complexes  
Sound insulation level III enhanced agreements

Sound insulation – value

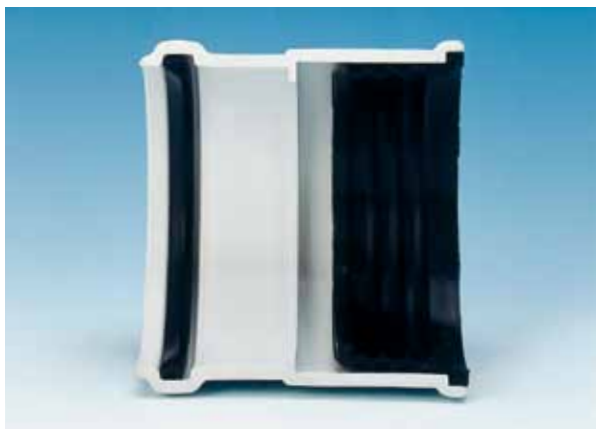
## Installation Instructions

### 1. TRANSPORT, HANDLING AND STORAGE

Skolan-dB pipes must not be bent during transport; the full length of the pipes should be supported. The pipes are to be laid down in such a manner that no damage occurs through deformation. Sockets must be unencumbered all around. At the construction site, stacking must not be carried out in excess of 1.50 m even if wood is laid down in between layers. Sealing elements may not be stored outside for longer than 2 years.

### 2. CUTTING THE PIPES TO LENGTH

The pipes can be cut to length with a commercial pipe cutter or with a fine-toothed saw. The cuts are to be made at an angle of 90° to the pipe shaft. Remove any trimmings or bumps at the disconnecting point. The cutting edges are to be smoothed on the inside and on the outside.



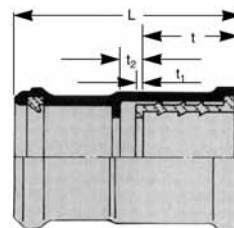
### 3. SKOLAN-DB CONNECTIONS

#### 3.1 PUSH-FIT CONNECTIONS WITH GASKET (SINGLE SOCKET)

Single sockets are equipped with larger sealing element: These gaskets are the standard connection between pipes and fittings. They have an extension compensator so that no measures need to be taken to allow for changes in length. The following procedure is to be observed:

- Trim the spigot end of the pipe and clean if necessary. Chamfering is not required
- Remove the gasket from the socket and pull it - without any lubricant - onto the spigot end of the pipe
- Smear the outside of the gasket with lubricant (do not use oil or grease) and also provide the inside of the socket with lubricant

- Push the spigot end with the gasket into the socket
- Push the single socket onto the spigot end until it resists
- Check the correct position of the gasket



DN(OD)	L [mm]	t [mm]	t <sub>1</sub> [mm]	t <sub>2</sub> [mm]
58	126	49	5	15
78	119	48	6	16
90	123	47	6	16
110	125	63	6	16
135	132	63	6	16
160	144	63	6	16
200	228,5	109	6	16



### 3.2 OTHER PUSH-FIT CONNECTIONS

Push-fit connections between pipes and fittings which are not produced with a single socket must, in the case of a maximum pipe length of 3 metres, compensate thermal changes in length of maximum 10 mm. Therefore pipes are to be pulled back 10 mm in the socket after the connection has been made.

- Clean the spigot end, the socket and the gasket if necessary
- Check the position and the intactness of the gasket in the socket corrugation
- Smear the spigot end with lubricant.
- Place the spigot end in a central position and push it into the socket until it resists
- Pull the pipe – not the fitting – back by 10 mm and - in case of a vertical position - protect the pipe from subsequent slipping by means of clamps

Additional connection couplings (such as those required in the case of cast-iron pipes) are not necessary with Skolan dB.

Push-fit connections are easier and quicker. This saves time and material.

## 4. INSTALLATION

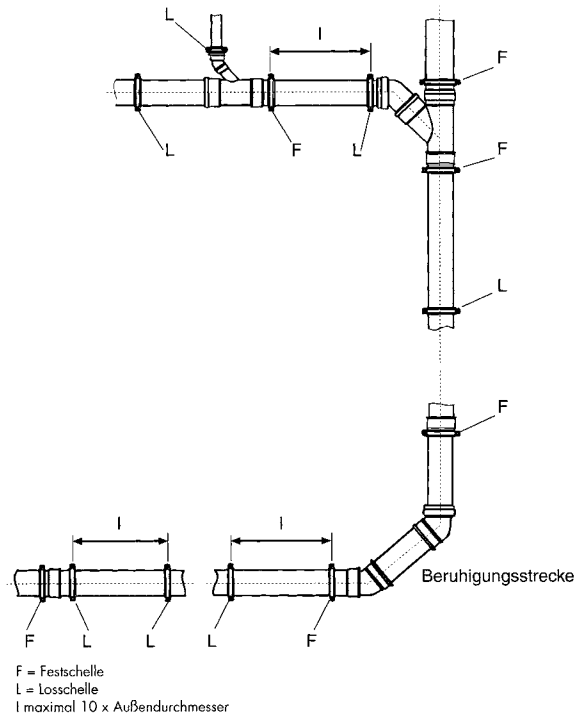
Skolan dB pipes are to be installed in such a manner that they are free of tension and that changes in lengths are not hindered. The Skolan dB soundproof pipe system is installed by using commercial pipe clamps with inserting tapes made of profile rubber.

Arranging the pipe clamps:

- The distance between the pipe clamps in the case of horizontal piping is approx. 10 x 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
- A fixed clamp and a loose clamp per pipe length (storey height of more than 2.50 m) are recommended for drop pipe lines
- 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
- Even when they are installed, loose clamps enable unhindered lengthways movements in order to allow for thermal changes in length
- 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



Pipe clamp with inserting tape as a loose clamp



Examples for the arrangement of fixed clamps and loose clamps

## 5. INSTALLATION IN CONCRETE/ BRICKWORK

Skolan-dB pipes and fittings can be directly set in concrete or plaster provided that adequate care is taken. In order to prevent the concrete mixture from seeping into the socket gap, it should be sealed with adhesive tape. Open piping components are to be closed. The piping is to be installed in such a manner that it is prevented from moving during the cementing process. Should the piping be plastered under a gap in the wall, a layer of plaster of at least 1.5 cm should be applied onto a plaster support (e.g. metal mesh). No acoustic bridge for structure-borne sound should be allowed to develop between the piping and the plaster support. In order to prevent this, the piping should be fully covered with sound insulation material (e.g. mineral wool, insulating sheaths).

## 6. RAIN DOWN PIPES

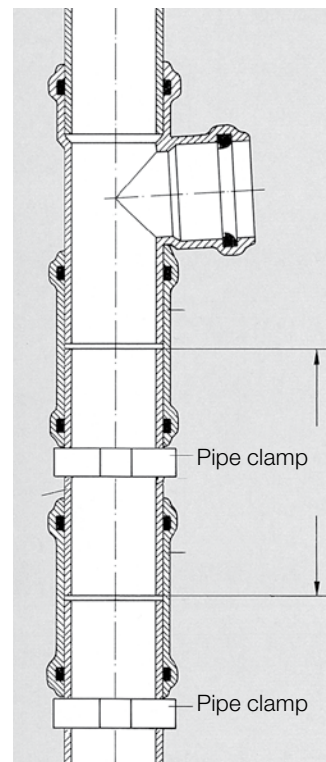
If rain down pipes are installed through living areas, a condensate insulation is recommended also for the Skolan dB, measurement and evaluation according to DIN EN 14366, test result of the Fraunhofer Institut (test report P-BA 63/2010) 20 dB (A) sound insulation with a usual standard pipe clamp. Installation instruction of the pull-out protection at [www.ostendorf-kunststoff.com](http://www.ostendorf-kunststoff.com).

## 7. CEILING PIPES

Pipes installed through ceilings must be sound-insulated with structure-borne sound insulation material and be damp-proof. Should melted asphalt be put onto the floors, the piping parts in the region where the pipe runs through the ceiling must be protected by means of protective pipes or by means of being wrapped in heat-insulating materials.

## 8. SUBSEQUENT INSTALLATION OF PIPING PARTS

Subsequent connections can be produced by means of the installation of a branch or by using couplers. In order to install, a sufficiently long piece of pipe ( $L = \text{length of the shaped part} + 2.5 d$ ) is removed and the branch is inserted. Cutting edges are to be cleaned and smoothed. A coupler is pushed onto both the remaining pipe without a socket and onto a piece of pipe equivalent to the gap. The piece of pipe is then inserted into the piping and the couplers are pushed over the cutting edges. The couplers are to be secured by means of clamps.



## 9. BENEFITS DN 90

According to the new DIN 1986-100 diameter DN(OD) 90 is required for water-saving toilets with 4,5 to 6 l flush volume. All over Europe water-saving toilets have been used for years with the dimension DN(OD) 90 without any problems. Further information at [www.ostendorf-kunststoffe.com](http://www.ostendorf-kunststoffe.com).



## Pull-out protection

### Convincing facts:

1. Increased safety through stronger hold at high pressure
2. Applicable for lifting systems up to max. 2 bar overpressure according to MPA Darmstadt (without pressure surges)
3. Use for rain down pipes up to max. 2 bar overpressure
4. Easy application with "clamp lock" – without screwing



### Practical application:

The stability and the functionality of a discharge system have to be ensured by a secure fastening. Discharge systems within the buildings structure can be subject to bigger inner pressure caused by particular stresses (for example the rain down pipe at heavy rainfall events).

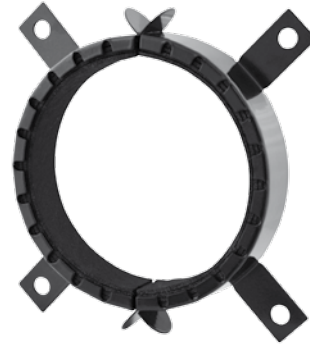
This can refer to the following pipe lines:

- rain pipes in the back water level (mostly in basements)
- rain down pipes, which go from the roof through more floors without further drain outlets
- rain water pipes in the area of distortions from the down pipe to the collection pipe (particularly at a falling pipe height of more than 22m)
- conveying pipes of discharge lifting systems

Installation instruction of the pull-out protection at [www.ostendorf-kunststoffe.com](http://www.ostendorf-kunststoffe.com)

## Fire protection

The basis for the planning and the implementation of fire protection can be found in the German model pipe system guideline (MLAR).



Product range, further information and installation instructions of the fire protection solutions can be found on the respective website of the producer: [www.walraven.com](http://www.walraven.com), [www.rockwool.de](http://www.rockwool.de)

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