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PE-HD drainage pipes

# Stidren



# PE-HD drainage pipes STIDREN

The STIDREN piping system is the ideal solution for draining large amounts of excess water from large areas. It is used to collect, channel and transport excess water of various origins, from rainwater and groundwater, to water that crosses the banks of the riverbed in emergencies.

STIDREN pipes are especially suitable for drainage of motorway surfaces as well as other road traffic facilities, such as tunnels, embankments and more demanding roundabouts, as well as conventional intersections, due to their exceptional resistance to static and dynamic loads and the smooth inner surface, which allows large flows. They are also successfully used to drain excess water from the area of railways, airport runways, as well as larger residential buildings, sports and children's playgrounds, golf courses and walking areas. STIDREN pipes are valued wherever it is necessary for drainage, during the construction phase and later during the use of facilities, to meet the highest requirements of quality, reliability and economy.

STIDREN pipes are two-layer, with an outer ribbed and an inner smooth wall, made of high-density polyethylene (PE-HD). They are the result of many years of development and fully meet the requirements for drainage and sewerage systems, while enabling low installation costs, high material savings and extremely little burden on the natural environment. The penetration of water into the inside of the pipe is enabled by transverse notches for water entry, which are placed in the groove between the two ribs, so that with minimal possibility of clogging the openings, water capture is optimal.

# Properties



**The pipes are suitable for the toughest operating conditions, as they have a number of excellent properties:**

- extremely low weight, which allows easier transport and easier installation
- excellent physical properties such as high circumferential stiffness and impact resistance, ensuring increased safety, durability and lower maintenance costs
- smooth inner surface that reduces friction against the wall and provides excellent flowability
- optimal automatic cleaning
- excellent abrasion resistance, which allows a long service life
- quick and easy installation of pipe systems,
- practically unlimited temperature range at which pipelines can be laid and serviced (from - 40 ° C up to +80 ° C)
- excellent chemical resistance to aggressive media and surrounding soil
- undoubted corrosion resistance
- environmental friendliness, as the pipes enable more than 30% material and energy savings compared to conventional full-wall pipes, while allowing very simple recycling

Standard: **SIST DIN 4262/1, STS-06/050**

# Materials



Pipes and fittings are made of high density polyethylene (PE-HD), which has very good mechanical and chemical properties, is an extremely environmentally friendly material and is practically irreplaceable in the current time of constant search for economical and long-lasting solutions in the field of drainage pipelines.

UV stabilizers are added to the polyethylene, which enables greater resistance to weathering and slows down aging.

**The pipes are made in accordance with STS-06/050 and from PE-HD raw material with the following characteristics:**

|                               |           |                   |
|-------------------------------|-----------|-------------------|
| density                       | >0,947    | g/cm <sup>3</sup> |
| melting point index MFI 190/5 | 0,4 - 1,3 | g/10min           |
| modulus of elasticity         | ≥800      | N/mm <sup>2</sup> |

# Production Program



The wall of the pipe consists of a profiled outer layer and a flat inner layer, which are welded between the ribs and form a homogeneous wall. The outer profiled layer greatly improves the mechanical properties of the pipe and significantly increases the stiffness of the pipe in the radial direction. The flat and smooth inner side, in addition to additional safety, also enables ideal hydraulic properties and thus large unobstructed flows. Water inlet openings are securely installed in the groove between the two ribs, so that water capture is optimal with a reduced possibility of clogging of the openings. The water intake slots shall be between 0.8 mm and 1.4 mm wide, and the total open area of the water inlet slots shall be at least 50 cm<sup>2</sup> per meter of pipe length.

**Pipe circumferential stiffness:**  $SN \geq 4 \text{ kN/m}^2$  EN (ISO 9969) or  $S_{R24} \geq 31,5 \text{ kN/m}^2$  (DIN 16961)



## Color:



The color of STIDREN pipes and fittings is black with a green line indicating the laying angle.





# Purpose of drainage pipe systems



The pipes are extremely resistant to static and dynamic mechanical loads, as they are designed for the most difficult operating conditions and thus especially suitable for drainage of large motorway and airport areas. The versatility of pipes - drainage, collection, sewerage and drainage of water enables additional simplifications in the construction of pipe systems and a significant reduction in implementation costs.

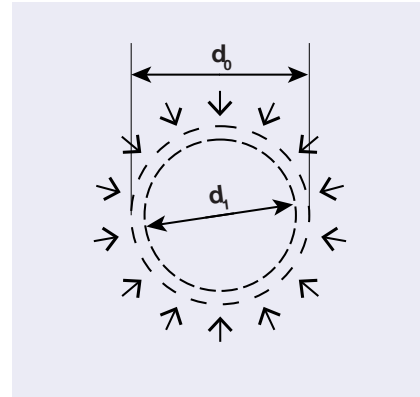




## Stidren D

The water inlets are evenly distributed over the entire circumference of the pipe (360 °). Stidren D pipes are intended for drainage of the terrain and are especially suitable for drainage of road and railway facilities, airports, tunnels, as well as landfills and other constructions due to their high resistance to backfill material pressure and dynamic surface load of vehicles.

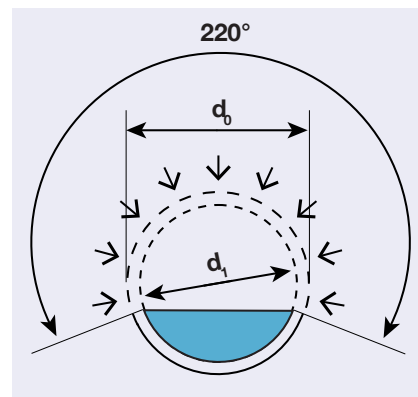
| Nominal diameter<br>DN (mm) | Outer diameter<br>$d_o$ (mm) | Inner diameter<br>$d_i$ (mm) | Pipe length<br>(m) |
|-----------------------------|------------------------------|------------------------------|--------------------|
| 110                         | 110                          | 95                           | 6                  |
| 160                         | 160                          | 136                          | 6                  |
| 200                         | 200                          | 176                          | 6                  |
| 250                         | 288                          | 249                          | 6                  |
| 315                         | 315                          | 272                          | 6                  |
| 350                         | 343                          | 300                          | 6                  |
| 400                         | 400                          | 347                          | 6                  |



## Stidren DD

The water inlet openings are distributed along the upper circular 220 ° circumference of the pipe. Stidren DD partial drainage pipes are also intended for drainage of the terrain and retain all the excellent properties of STIDREN D full drainage pipes. For proper orientation of the pipe when laying and backfilling, they need marking green lines that are on the top of the pipe.

| Nominal diameter<br>DN (mm) | Outer diameter<br>$d_o$ (mm) | Inner diameter<br>$d_i$ (mm) | Pipe length<br>(m) |
|-----------------------------|------------------------------|------------------------------|--------------------|
| 110                         | 110                          | 95                           | 6                  |
| 160                         | 160                          | 136                          | 6                  |
| 200                         | 200                          | 176                          | 6                  |
| 250                         | 288                          | 249                          | 6                  |
| 315                         | 315                          | 272                          | 6                  |
| 350                         | 343                          | 300                          | 6                  |
| 400                         | 400                          | 347                          | 6                  |

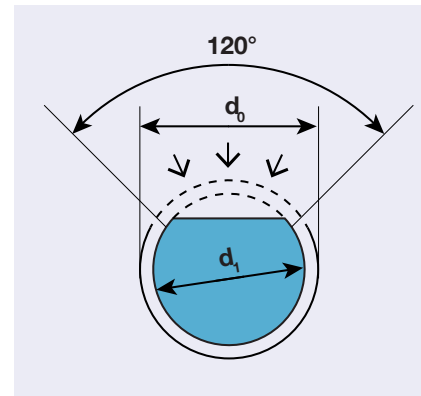




## Stidren DK

The water inlet openings are distributed along the apex circular circumference of the pipe within a 120-degree center angle. Drainage sewer pipes Stidren DK have the function of drainage pipes, and at the same time perform the task of collecting - sewer pipes. The joints between the pipes and the connecting pieces are sealed with sealing rings so that the connections are watertight. For proper orientation of the pipe when laying and backfilling, they need marking green lines that are on the top of the pipe.

| Nominal diameter<br>DN (mm) | Outer diameter<br>$d_o$ (mm) | Inner diameter<br>$d_i$ (mm) | Pipe length<br>(m) |
|-----------------------------|------------------------------|------------------------------|--------------------|
| 110                         | 110                          | 95                           | 6                  |
| 160                         | 160                          | 136                          | 6                  |
| 200                         | 200                          | 176                          | 6                  |
| 250                         | 288                          | 249                          | 6                  |
| 315                         | 315                          | 272                          | 6                  |
| 350                         | 343                          | 300                          | 6                  |
| 400                         | 400                          | 347                          | 6                  |



# Pipe Connection



The STIDREN system is designed in such a way that the pipes and various connecting pieces are joined quickly and easily by inserting the pipes into the clamp of the connecting piece. The coupling technology enables minimal consumption of time and effort and ensures optimal flow and minimal hydraulic losses. The joints are impermeable to sand and other soil particles. For STIDREN DK pipes, EPDM sealing rings that comply with DIN 4060 and ensure the impermeability of water joints are also used for connecting.

Pipes of dimensions DN 250, 315 and 355 can have an already welded coupling and

an inserted sealing ring, so that assembly is even easier and faster.

Prior to joining pipes and fittings, the contact surfaces must be clean and undamaged.

If the required pipe length is shorter than the standard one, cut the pipe straight (with a knife or a fine-toothed saw). Push the plug end into the connecting piece to the limit. If the joints are made with sealing rings, the seal and the joint must be lubricated with a suitable friction reducing agent (grease for rubber seals, silicone oil,

# Quality Assurance



The pipes are manufactured in accordance with STS-06/050 (Form D) and DIN 16961. STS-06/050 requires continuous pipe inspection:

## **In the production process:**

- dimensional control (outer diameter, inner diameter, inner wall thickness, wall thickness of the welded inner and outer layer)
- control the appearance of the pipe (surface appearance, color, inscription on the pipe)

## **And regular testing:**

- the width of the water inlet
- common exposed surfaces of water inlet slots
- peak stiffness of the pipe (shape stability)
- impact resistance of pipes
- tightness of STIDREN DK pipe joints and joint pieces

Control and testing of both input materials and finished products is carried out continuously in our own testing laboratory. We also perform constant control and improvement of the production process, all with the aim of adapting the level of quality to the ever-increasing requirements of technical regulations and the wishes of users.

In parallel with the internal testing, STIDREN drainage pipes made of PE-HD, obtained all necessary consents, as evidenced by the issued test reports.



# Transport and Storage



PE-HD pipes, due to their high resistance to wear and impact and low weight, enable undemanding transport and storage procedures and practically do not require special protective measures. The pipes are still sufficiently tough and impact-resistant even at low temperatures (below 0 ° C). Nevertheless, reasonable handling is required, special attention should be paid to sharp objects and edges that can permanently damage the pipe. Therefore, it is necessary to clean the means of transport and storage areas with sharp objects and protect the sharp edges.

| Nominal diameter DN (mm) |   |                              | 100 | 160 | 200 | 250 | 315 | 355 | 400 |
|--------------------------|---|------------------------------|-----|-----|-----|-----|-----|-----|-----|
| Pipe length (m)          | 6 | No. pipes per pallet         | 76  | 360 | 20  | 16  | 9   | 9   | 9   |
|                          |   | Total length in m per pallet | 456 | 198 | 120 | 96  | 54  | 54  | 54  |

The pipes should be folded along their entire length and should be protected against slipping. The loading height should not exceed one meter. In the case of palletized pipes and multi-storey storage, it is necessary to ensure that the wooden frames of one pallet rest on the wooden frames of the pallet below it (wood on wood).

When loading or unloading pipes, do not pull over sharp edges or on the ground. We recommend the use of suitable tools, such as lifting straps.

The material from which the pipes are made is UV stabilized and thus quite resistant to ultraviolet rays and other weather conditions, but we recommend that the pipes be stored unprotected from the weather for a maximum of one year. In case of prolonged storage, the pipes must be protected from the sunbeams.



# Pipe installation



Pipe installation must be carried out by qualified workers under professional supervision. When installing the pipes, it is necessary to follow the general guidelines for laying pipes that are laid in the ground and are roughly defined in the standard SIST EN 1610 and also in the standard DIN 4033.



## Installation procedure drainage pipes

With proper preparation of the bed (thickness 15 cm) with sand or other soil that can be hardened and which does not contain stones (grains up to 20 mm), good and gradual hardening of the backfill (degree of compaction according to Proctor  $D_{pr} > 95\%$ ) pipes and 30 cm above the top of the pipe, it is achieved that pipes covered with earth from 0.8 m and up to 8 m and even under the heaviest traffic load SLW 60 (according to DIN 1072) are not deformed above the permissible limit 6 %.

More detailed installation instructions can be found in the "Downloads" category, where, in addition to the catalogs, you will find guidelines for laying pipelines, which deal with ditch excavation, bed construction, overlapping and main backfilling of the pipeline. General guidelines for testing the tightness of laid pipelines in accordance with SIST EN 1610 are also available.

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