MegaCor | Ultra Rib 2 PP SN10 | Ultra Rib 2 PP SN16 | Ultra Rib 2 Rain PP SN12

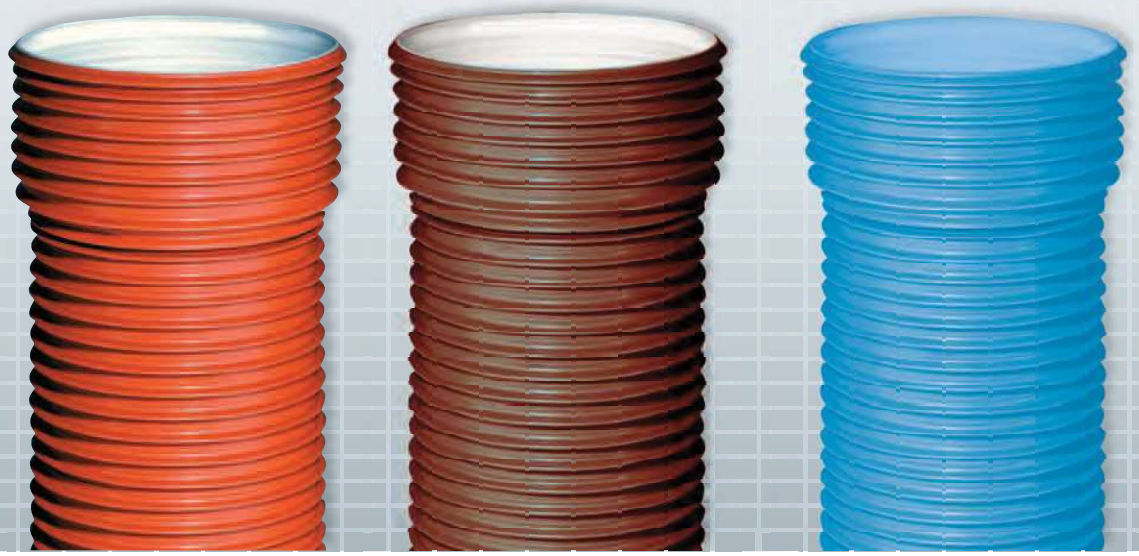
PIPE SYSTEMS

OUR ENVIRONMENT NEEDS
NEW SYSTEMS NOW...

SEWAGE SYSTEMS

STORMWATER SYSTEM

Ultra Rib 2 PP SN10	Ultra Rib 2 PP SN16	Ultra Rib 2 Rain PP SN12



THE FULLY WELDANLE PP PIPE SYSTEMS FROM ANGER HAVE THE FUTURE UNDER CONTROL.

No matter whether you choose the Ultra Rib 2 PP SN10 or SN16 rib-reinforced full-wall pipe for **sewage disposal** or the Ultra Rib 2 Rain PP SN12 for **stormwater disposal**: all of our PP pipe systems are fully compatible with one another and with our chamber systems DN 400 to DN 1,200.
We will, of course, provide you with the appropriate chamber system for our large pipe MegaCor.

...AND WE HAVE THEM FOR YOU.

By combining the pipe components with our chamber systems (DN 150 to DN 1200), you will create a complete system for sewage disposal, from the chamber cover right down to the base of the pipe.

With Anger complete systems, you will receive all components from a single source. This results in all components being fully compatible with one another, with the highest possible degree of safety and efficiency.

A competent contact person is available to help with all processes involving the sewage system, such as questions about your order, logistical support or technical support - saving you time and stress.

MonoCor 1000 PP

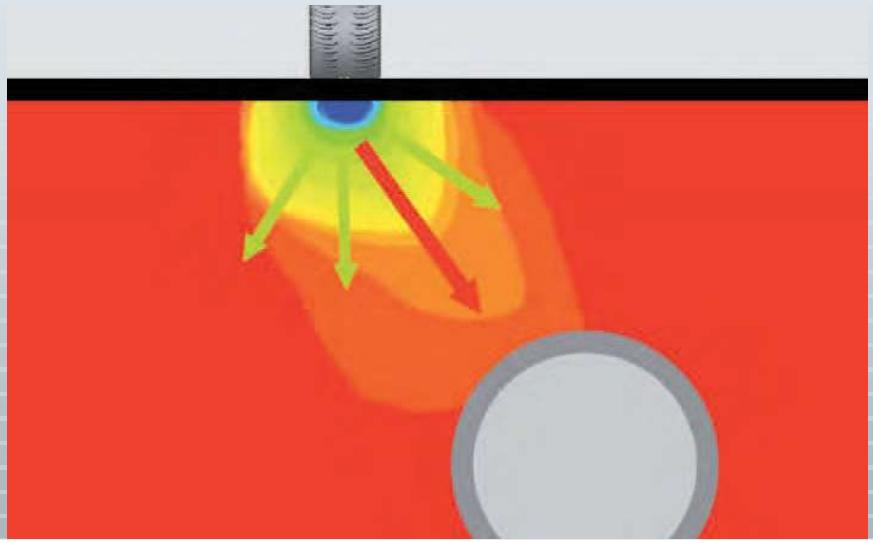
For the first time, you have the opportunity to weld a pipe system directly to the chamber by using our monolithic, self-levelling PP chamber systems, thus ensuring an optimal level of safety at all times. Thus, leaky chamber constructions and pipeline systems are firmly a thing of the past.

LOAD-BEARING BEHAVIOR OF FLEXIBLE PIPE SYSTEMS

According to investigations by the German Wastewater Association (ATV), a significant percentage of public sewers are defective. A comparison of damage profiles illustrates that the damage can primarily be attributed to static factors. These result in malfunctions and breakdowns that cause ecological and economic damage.

Sewage discharge (exfiltration) contaminates ground water. Ground water admission (infiltration) puts a strain on sewage treatment plants. The predominant cause of this damage is a mechanical failure, even though the pipe material used is designed for long-term use.

This state of affairs provides food for thought. Sewers are primarily laid in trenches, with the majority of the stress placed on them coming from soil loads and live loads. During a pit excavation, the natural bedding conditions of the soil are disturbed. Filling the trenches creates pressures that are relative to the type of lining, the compression of the soil and the stiffness of the pipe.

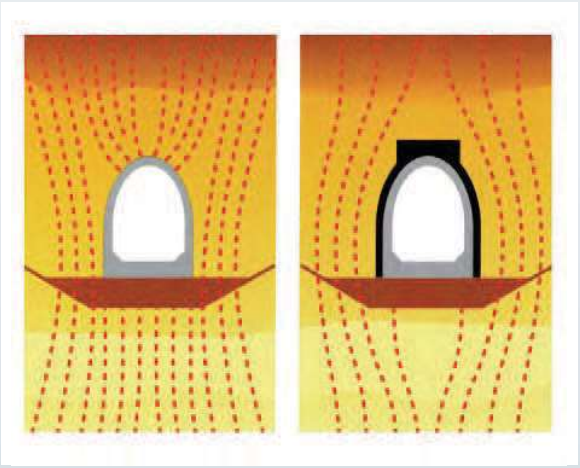


When making a static calculation* of pipelines, factors such as soil mechanics, material strength, building construction and live loads must be taken into account. In addition, long-term changes will need to be reckoned with as well. Soil erosion, ground water levels and soil displacements influence the surrounding conditions of a sewage pipe.
The reaction of the sewage pipe to these conditions is of critical importance.
Higher stiffness does not necessarily lead to a higher load-bearing capacity.
When constructing a tunnel in areas with high earth deposits, the elasticity that the structure lacks is attained by fitting it with padding. This offsets the load on the arches.

*Upon request, we will create verifiable statics for your construction project free of charge.
You can find the site questionnaire required for this on page 160 or on our homepage.

Load lines for the standard filling of the tunnel

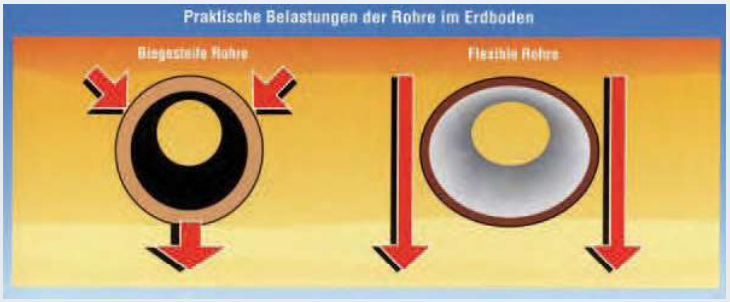
Load lines when padding is inserted along the arches



All solutions in this direction are compromises, as they only have a limited impact. Ultimately, only the pipe material can offer the optimal solution by reacting in a flexible manner to the respective load changes thanks to its elastic property.

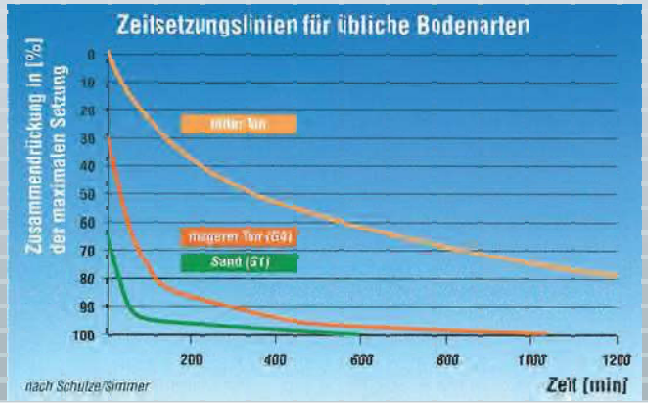
Underground sewage pipes must bear part of the arising loads during and after their installation. The proportion of the load that has an effect on the pipe grows with increasing stiffness.
In the case of rigid pipes, the loads are focused on the body of the pipe.
These remain on a long-term basis and can, over time, exceed the load bearing capacity limits. This results in cracks, fractures and other damages.

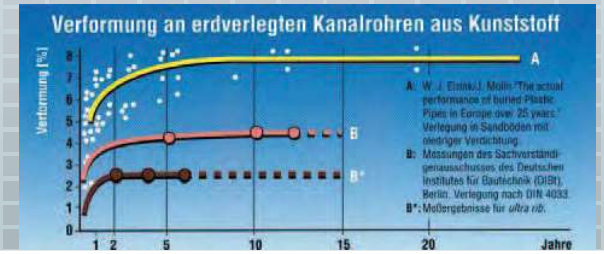
For elastic pipe systems, these loads are distributed to the surrounding soil.

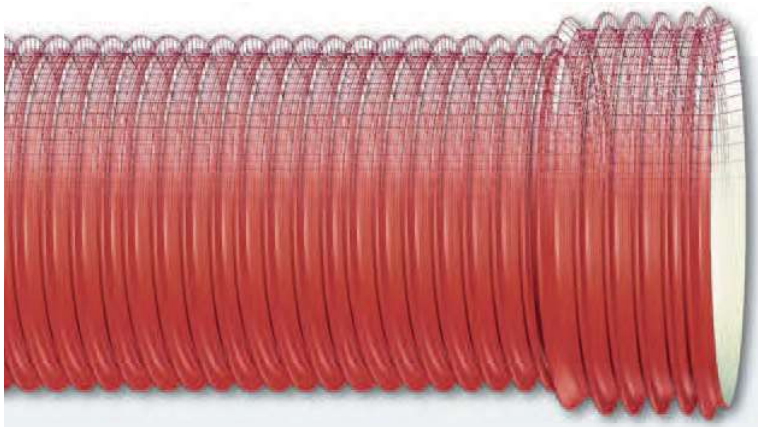


This distribution is made possible through the pipe system's controlled plasticity. Flexible plastic sewer pipes evade soil loads due to their plasticity. This occurs in both the axial direction, in the case of differences in bedding, as well as radially due to the loading. The surrounding soil absorbs the loads. This applies for planned loads (loads in the trench and live loads), as well as for unforeseen loads as a result of variations made during the planning or installation and any subsequent soil changes. Numerous studies deal specifically with the mechanical stress of operational plastic sewer pipes and the resulting deformations. More than 40 years of results for deformation measurements in the sewer system are available. These studies have shown that, depending on the installation and soil quality, an equilibrium is generally established in the pipeline area after two to three years and no further deformations occur. The pipe remains in the ground, load-free, on a long-term basis.

The long-term stability and operational safety of a sewer construction depends on how rigidly or flexibly the pipe system reacts to changes. The more elastic the pipe is, the quicker the equalization between pipe and soil will take place and the quicker the loads will be absorbed in the surrounding soil.







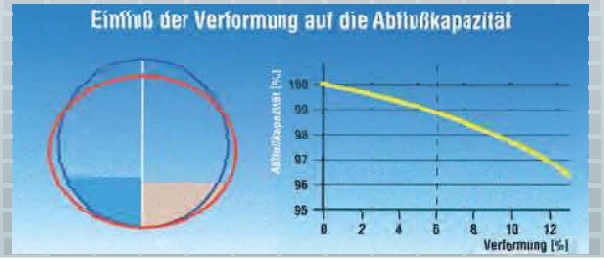
IN PRACTICE, THIS MEANS:

AS STIFF AS NECESSARY, AS ELASTIC AS POSSIBLE.

Stiffness should not be confused with stability here. A jumbo jet's wings oscillate when in flight, skyscrapers sway almost noticeably in the wind – it is only their ability to adapt to stresses that ensures their stability.
It is a similar story with Anger pipe systems: they react to static loads flexibly, in an almost programmed manner. This is because the loads are not focused on the pipe, but instead diverted to the surrounding soil.
In practice, cracks in the pipe are the primary cause of damage. These indicate an excessive load. Elastic pipes react to this with an additional plasticity. Cracks and fractures do not arise with Anger pipe systems.

The pipe diverts the forces into the soil and marginally distorts itself (within permitted limits).
Experts speak of the "tunnel effect". However, this is not an indication of weakness, but rather of strength – and is an intentional, soil-mechanical effect. It's why flexible pipes continue to work while rigid pipe systems would long since have broken. It's no coincidence that nowadays gas providers virtually work only with flexible plastic pipe systems on the grounds of safety - or have you ever seen a gas pipe made from concrete or stone?

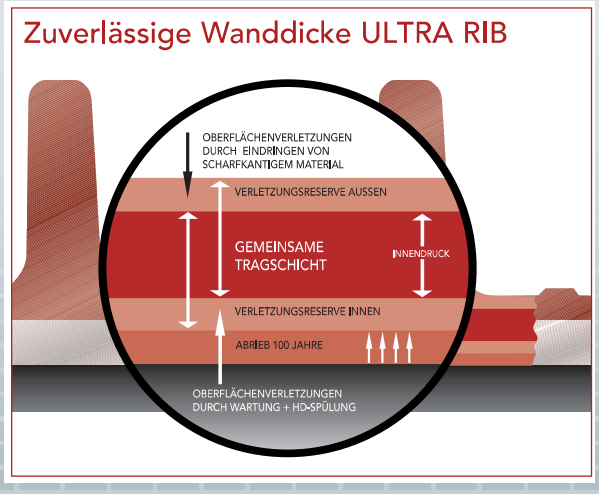
Usually, deformations in flexible pipe systems are at max. 3-4%. Deformations higher than this are primarily caused by mistakes made during installation; however, this does not lead to the breakage of the flexible pipe system and the function of the pipe is practically unaffected. Even a vertical deformation of 6% only causes a minimal decrease (1%) in the pipe's flow rate.

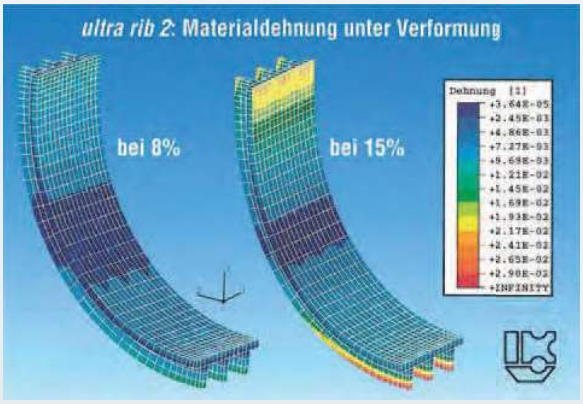


SAFETY

These high safety reserves are the result of an intelligent wall design, such as our patented, rib-reinforced full-wall design: the Ultra Rib 2 pipe system.
The Ultra Rib 2 PP SN10 / SN16 consists of a homogeneous pipe body, colored brown on the outside so that it can be clearly identified as a sewage pipe. The inside is colored in inspection-friendly white to ensure an optimum image quality during a camera inspection. The Ultra Rib 2 Rain PP SN12, designed to carry stormwater, is colored completely blue throughout.
Thus, for any subsequent camera inspections after it has been installed, the pipe system can also be clearly and permanently identified as a stormwater pipeline.

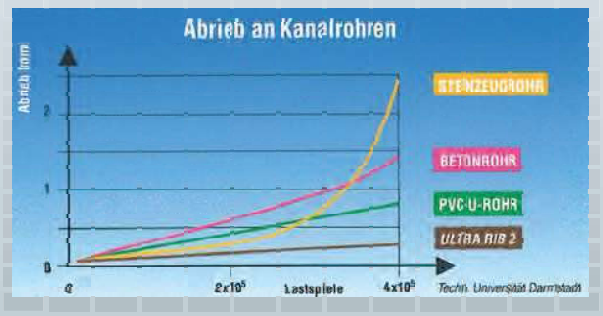
The rib construction ensures greater safety, as profiled pipes make specific use of the material's physical properties.





SERVICE LIFE

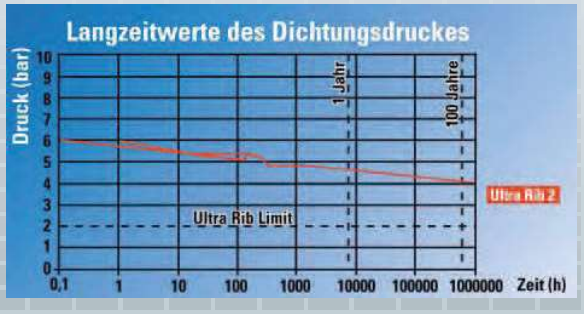
Surface damage and interior abrasion are the two enemies of all pipes. The wall thickness therefore needs to be designed to cope with this stress. The wall thickness of Anger pipe systems is two to three times higher than the standard requirement. The wall thickness of Anger pipe systems is based on scientific studies (Prof. Dr. Stein, University of Bochum) and is oriented towards long-term mechanical stresses that occur during operation (abrasion, high pressure flushing, etc.), which have a crucial effect on the durability of plastic pipes in sewers. In the case of Ultra Rib 2, this means a service life of more than 100 years.



Stress test: 100% tightness with 30% deformation

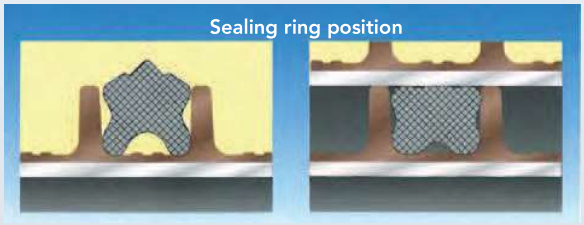
HYDRAULICS

With the Anger pipe systems, your sewer system will be in good shape and flowing like a dream.
The smooth, non-porous pipe interior ensures the quick and trouble-free discharge of sewage on a long-term basis. The wall roughness (k-value) of 0.007 speaks for itself and ensures that no contamination takes hold. Incrustations are therefore avoided and the intervals between cleaning are increased. This also means: less problems and, above all, lower maintenance costs.
In combination with a large pipe cross section DN = Di, Anger pipe systems also boast an extremely high hydraulic performance. The hydraulic potential is up to 20% higher than that of conventional smooth-wall pipes thanks to pipe diameters that are actually usable.

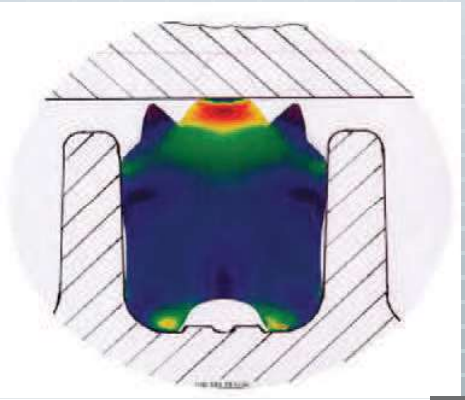


TIGHTNESS

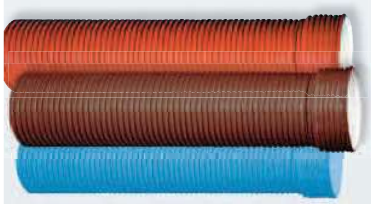
All Anger pipe systems meet the tightness requirements as per DIN EN 1610.
The ATV primarily requires durability and leak tightness for sewers. This places particularly high demands on the sleeve connection. Anger solved this problem by positioning the sealing ring on the spigot end between the ribs. From this position, the ring acts like a fixed ring,



protected against overloading by the rib construction up to a deformation of more than 30%.
The symmetrical sealing ring is fixed in place between the ribs and reliably seals the pipe system against exfiltration and infiltration alike thanks to its special cross section.



THREE PIPES –
ONE BRILLIANT MATERIAL



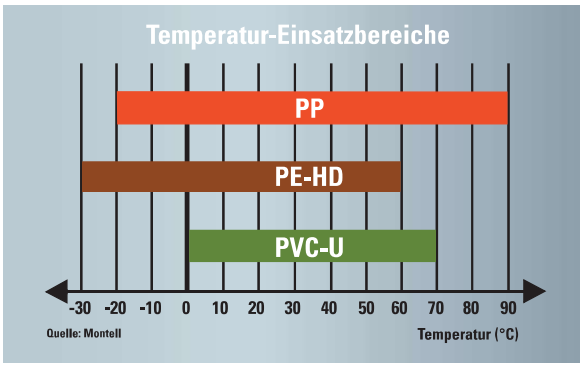
SAFE DISCHARGE

Day by day, we meet the major challenges concerning environmentally friendly and safe sewage disposal with our fully developed and future-oriented plastic pipe solutions made from polypropylene. Our profiled pipe systems, which have been approved by the DIBt (German institute for civil engineering) and undergone external inspection, enable the safe discharge of sewage that has been highly contaminated both chemically and thermally.

MATERIAL

The excellent technical properties of our unfilled PP block copolymer, used in conjunction with a sophisticated pipe geometry, considerably surpass those of conventional polypropylene materials. The special characteristics of this high-quality material are:

- large temperature range (-20°C to +90°C)
- high chemical resistance (pH 2 to pH 12)
- high abrasion resistance



EFFICIENCY

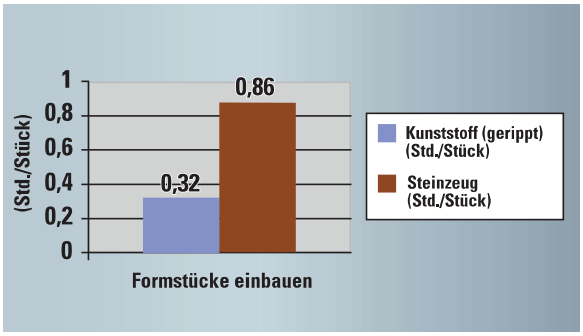
Pipe lengths of up to 6 meters, high ring stiffness values in accordance with DIN EN ISO 9969 from SN 10 to SN 16 and easy handling thanks to a low dead weight guarantee the fast, safe and efficient progress of the construction work. Even live loads of **SLW 60**, which occur frequently in public traffic, can be borne reliably with a **minimum coverage of 0.5 m**. For the pipeline area, all grain sizes from DIN EN 1610 can be installed without any restrictions for all nominal diameters. Furthermore, the use of a program of molded parts and chambers for both pipe systems gives rise to economical benefits such as low storage costs and a simplification of the logistics process.

HIGH PRESSURE FLUSHING

Anger pipe systems are dimensioned for maintenance and flushing in line with the typical German standards, including long-term.
Studies have shown that, with Ultra Rib 2, all types of deposits are loosened with an operating pressure of max. 120 bar. This operating pressure is the maximum recommended pressure in the current version of DIN EN 13476-1. If you look at the recommendations contained in DIN EN 13476-1, you will find - under "Notes" - that 60 bar is sufficient for removing soft coatings of dust. 80 to 120 bar may be required to remove more solid build-ups of material.

OPERATING COSTS

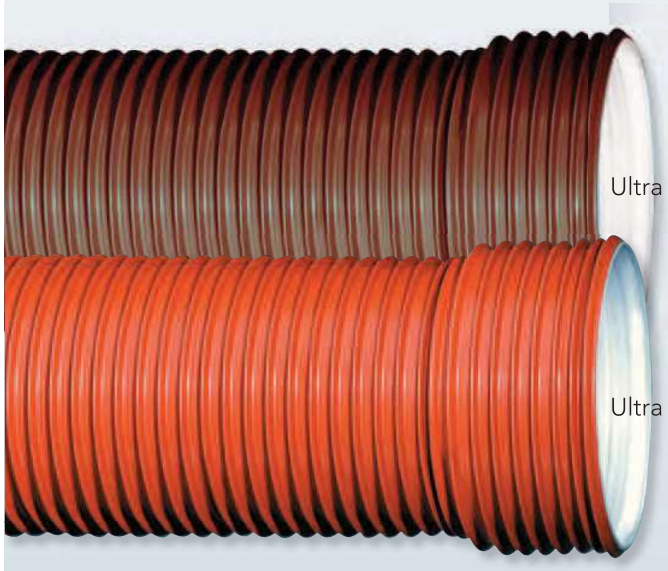
The virtually hydraulic smooth, non-porous surfaces of our PP pipe systems ensure that build-ups do not take hold. An ideal condition for self-cleaning. It also serves to reduce maintenance costs, as operational cleaning intervals can be extended. At the same time, energy and water can be saved thanks to reduced flushing pressure. Its incredible durability (100 years) allows for long-term household planning and long depreciation periods in accordance with LAWA (the German Federal States Committee on Water Issues).



Source: Arbeitszeit-Richtwerte, Infrastructure DN 200, fittings

ANGER Ultra Rib 2 PP SN10 AND SN16

Safe SEWAGE DISPOSAL



QUALITY OVER QUANTITY

For over 20 years, the reinforced ribbed full wall pipe Ultra Rib 2 from Anger has proven that, by using the perfect material, a pipe system can be produced that boasts unbeatable stiffness, durability and safety.

The environmental aspect in relation to the resource-friendly use of raw materials was a top priority during the development process.

The patented, unique combination of a full-wall design and rib-reinforced profile guarantees a high impact strength together with extremely high ring stiffness for flexible pipe systems, in accordance with DIN EN 13476-1 and DIN EN 13476-3.

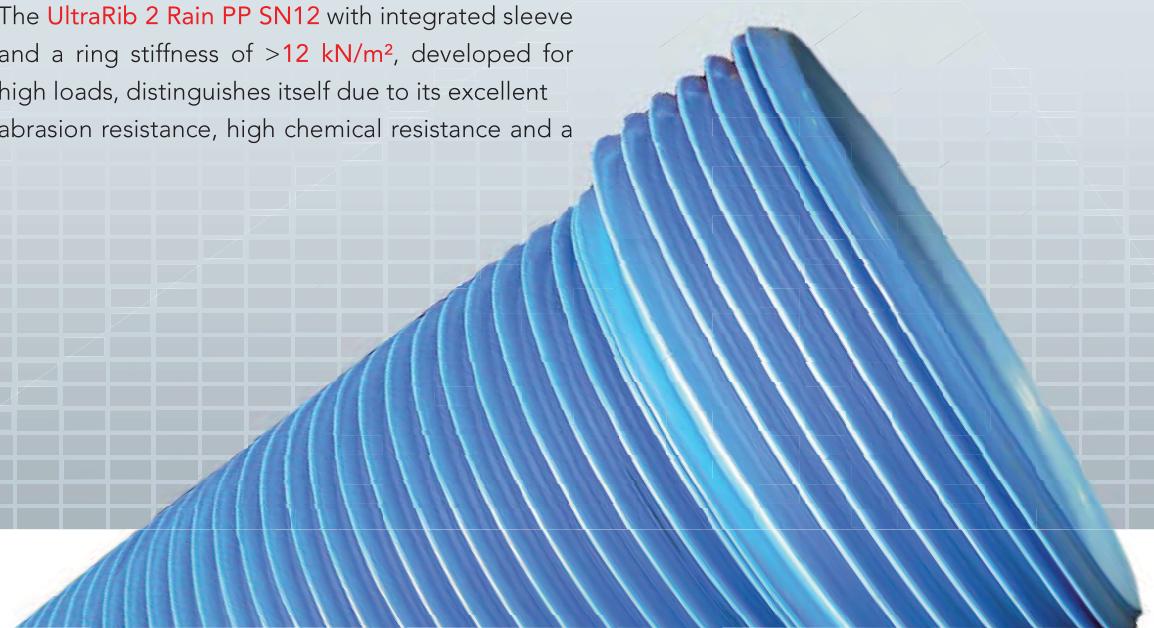
Further installation benefits are not only to be seen in the exhaustion of grain sizes in accordance with DIN EN 1610, but also in an almost 100% increase in the largest grain size for crushed material.

			Side filling and covering	
Construction material	**DN**	**Bedding and covering**	**Standard plastic pipe**	**Ultra Rib 2**
Material with graduated grain size	≤ 200	DIN EN 1610	≤ 22 mm	≤ 45 mm
	> 200	DIN EN 1610	≤ 40 mm	≤ 45 mm
Crushed material	< 900	DIN EN 1610	≤ 11 mm	≤ 20 mm

ANGER Ultra Rib 2 Rain PP SN12
The new standard in STORMWATER DISPOSAL

The demands on modern sewage disposal networks regarding the operating life, abrasion resistance, chemical resistance and environmental compatibility of the materials used are constantly growing larger. In order to meet these demands, Anger also offers the tried and tested pipe profile of the rib-reinforced full-wall pipe Ultra Rib 2 Rain PP SN12 for the discharge of stormwater.
The pipe, which is completely colored throughout, is instantly recognizable as a stormwater pipeline thanks to its blue-colored interior and exterior.

The UltraRib 2 Rain PP SN12 with integrated sleeve and a ring stiffness of >12 kN/m², developed for high loads, distinguishes itself due to its excellent abrasion resistance, high chemical resistance and a temperature range of -20° C to +90° C. Since the nominal diameter corresponds to the actual interior diameter in our pipe systems, a hydraulic discharge cross section is more than up to the task of safely discharging - even in the case of extraordinarily high levels of rainfall - the additional stormwater amounts.



Ultra Rib 2 PP SN10, SN16
Ultra Rib 2 RAIN PP SN12
PIPE SYSTEMS WITH A FUTURE

The huge success of our pipe systems is based on their rib-reinforced full-wall design, which protectively surrounds the water bearing service pipe like a "rib airbag" and simultaneously incorporates the sealing profile. The ribs not only protect the service pipe, but also protect the seal against being twisted during installation and offers optimal protection for the symmetrical seal. Thus, the pipe system is safely protected against infiltration and exfiltration.

LOW WEIGHT

Anger pipe systems are significantly lighter than concrete pipes. However, they are robust enough that they can be used without any problems from a minimum cover of 50 cm for simultaneous SLW 60 live loads.

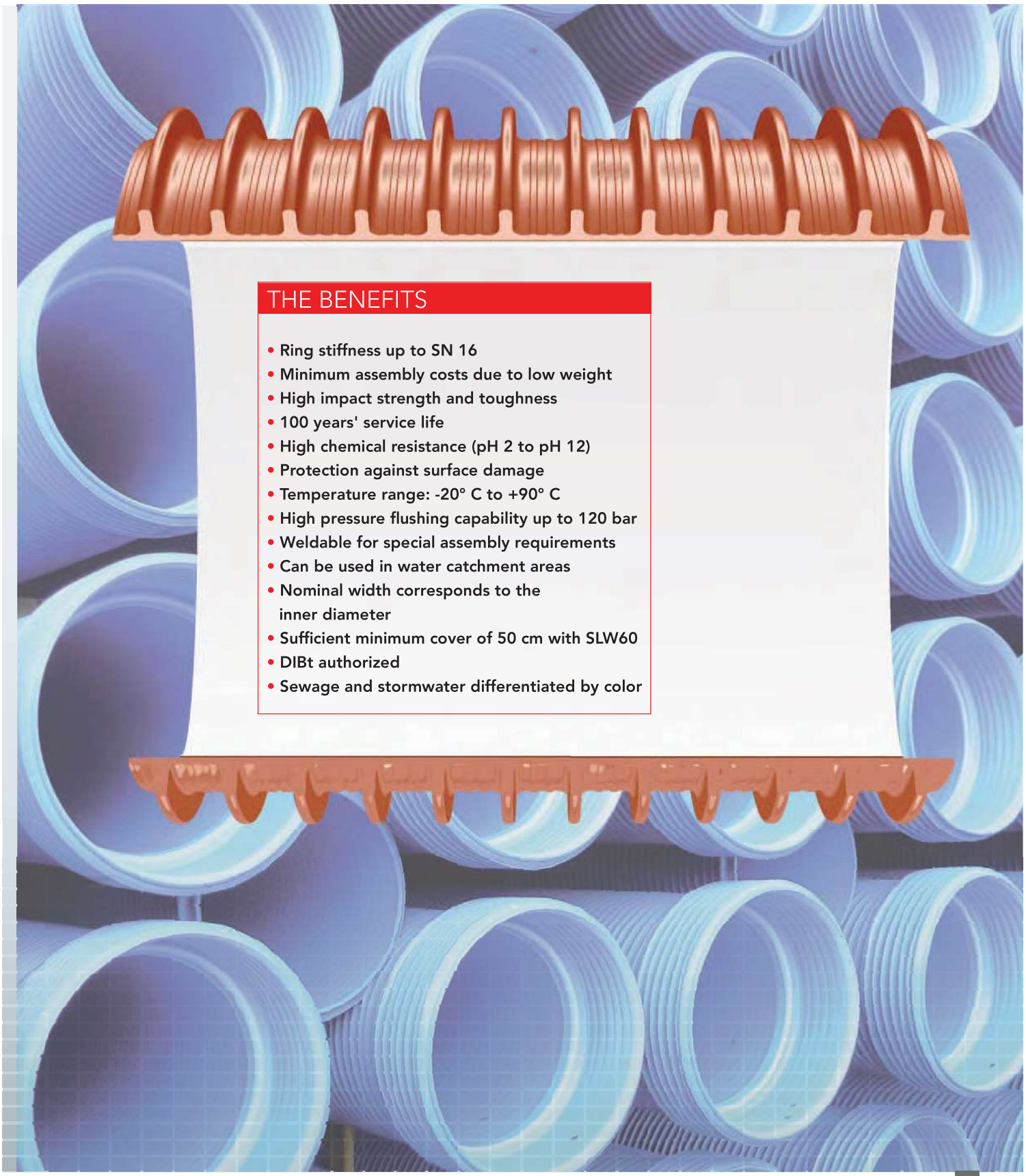
EASY HANDLING

The low weight of the pipe systems makes itself felt not only in the reduced transports costs, but also during the installation. They can be placed in pipe trenches quickly without having to use heavy lifting equipment. They can be cut to length easily and conveniently connected using sleeves.

Wall roughness	
Ultra Rib 2	≥ 0.007 mm
Concrete pipe *	1 to 3 mm (usually smooth)

Pipe lengths	
Ultra Rib 2 Rain PP SN12	3.0 and 6.0 m
Ultra Rib 2 SN10 SN16	2.0; 3.0 and 5.0 m
Concrete pipe *	generally 1.0 m

* Source: according to DIN 4032, Schneider Bautabellen



THE BENEFITS

- Ring stiffness up to SN 16
- Minimum assembly costs due to low weight
- High impact strength and toughness
- 100 years' service life
- High chemical resistance (pH 2 to pH 12)
- Protection against surface damage
- Temperature range: -20° C to +90° C
- High pressure flushing capability up to 120 bar
- Weldable for special assembly requirements
- Can be used in water catchment areas
- Nominal width corresponds to the inner diameter
- Sufficient minimum cover of 50 cm with SLW60
- DIBt authorized
- Sewage and stormwater differentiated by color

Ultra Rib 2 WELDING RING
UNIVERSALLY APPLICABLE

EXTREME APPLICATION

Special installation conditions – such as steep slopes, drinking water protection zones or the discharge of heavily contaminated industrial sewage – require special solutions. With the Ultra Rib 2 welding ring, we offer you the perfect solution for waster water and rainwater drainage.
The Ultra Rib 2 welding ring impresses thanks to its easy installation and short welding time. A permanent, extremely tight (> 2.4 bar) longitudinally force fitting connection is created in approx 1.5 minutes. Afterwards, you will have a sewage pipe that is free from weak points (elastomeric seals) and thus ideally suited for draining sewage in a pH range of 2 to 12.

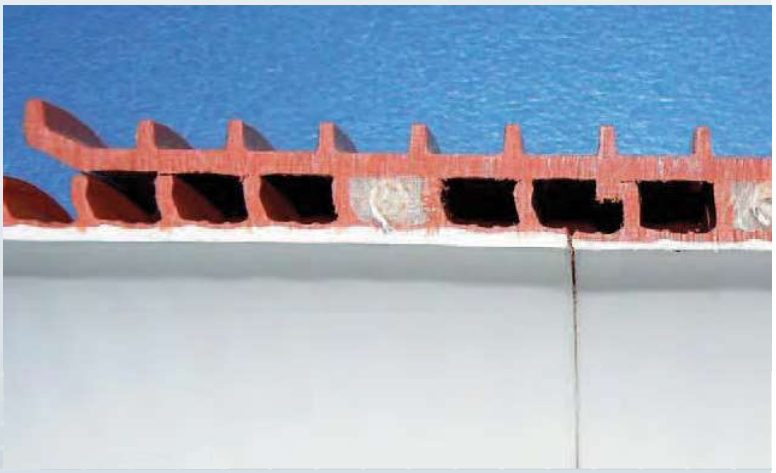
The installation is extremely simple and quick. After the spigot end of the pipe and the sleeve have been cleaned, the Ultra Rib 2 welding ring is inserted between the 2nd and 3rd rib, replacing the "rubber ring", and then welded using a general-purpose welding device once the pipes have been interlocked. The required welding parameters will be read with the help of a barcode card, which comes attached to every welding ring, by the welding device's barcode reader.

INSERT, PUSH IN, WELD, FINISHED!

THE Ultra Rib 2 WELDING PROCESS

Fields of application for welding ring technology:

- damp cohesive soils
- mining subsidence areas
- water catchment areas (drinking water protected zones)
- steep slopes
- industrial applications (discharge of water-polluting substances, e.g. from the chemical or metal processing industries, landfills, etc.)
- laying in aquifiers



Welded pipe connection

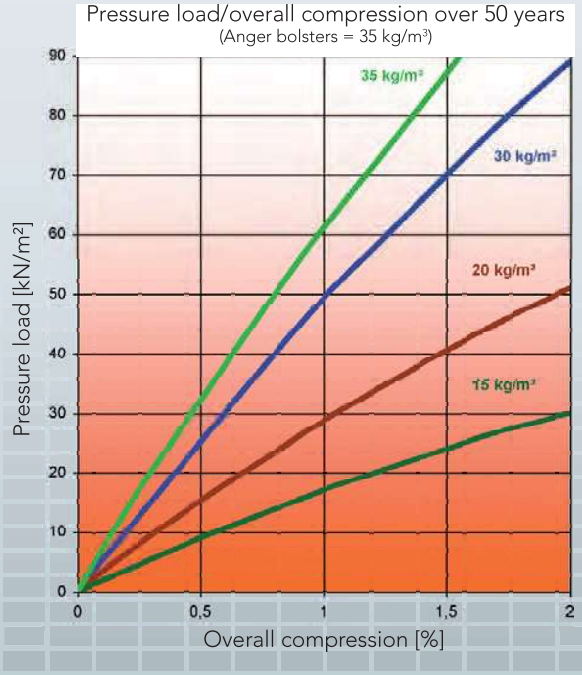
THE BENEFITS

- **Longitudinally force fitting connection**
- **High leak tightness (> 2.4 bar)**
- **Easy handling**
- **Very little additional expense for the installation**
- **Welding possible with general-purpose welding devices**
- **Quick and efficient installation**
- **short welding times**

TROUBLE-FREE INSTALLATION
USING BOLSTERS

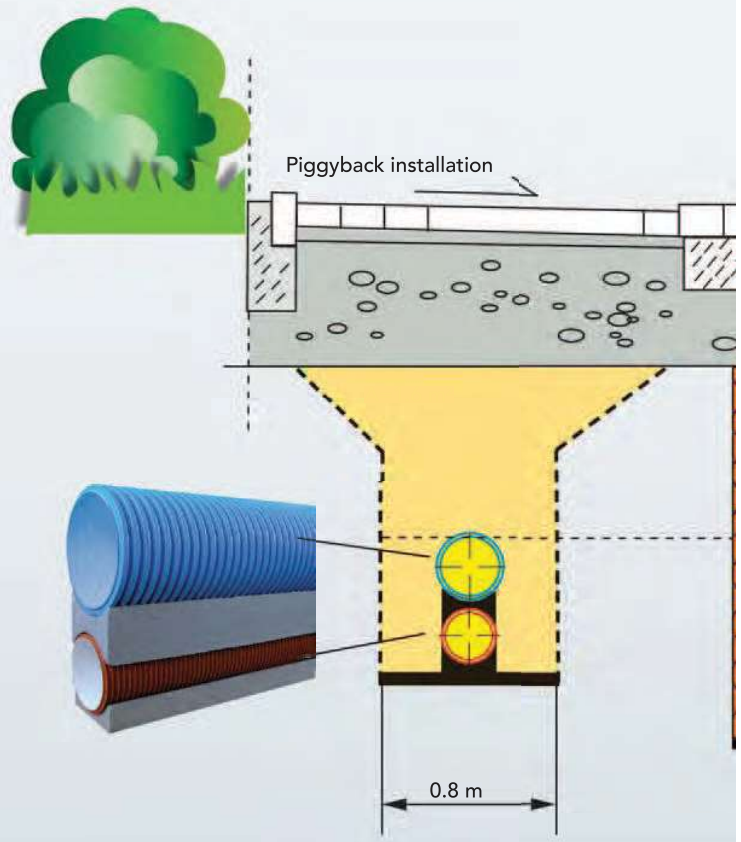
The quality of a pipe system depends to a large extent on the installation conditions. Unfortunately, the professional installation of the gusset area is often neglected. This results in positional changes and deformations, impairing the function of the pipe system.

The use of pipe installation bolsters eliminates the problematic sealing of the gusset area. The pipe system rests on an EPS bolster at a support angle of 120°, the diameter of which corresponds to the outer diameter of the respective pipe. This guarantees the pipe system is in the optimal position at all times, even for adverse soil conditions and minimal slopes, as the acting forces in the foundation are optimally diffused by enlarging the supporting surface.



ECONOMICAL INSTALLATION

The tense financial situation in many communities and businesses calls for economical solutions – now more than ever. Using EPS twin bolsters for separation systems (under certain boundary conditions) makes it possible to install two pipeline systems, one on top of the other, in a narrow trench in an economic, stable and effective manner. The stormwater pipeline can be positioned above or below the waste water pipeline. The bolsters make it possible to combine different diameters, ranging from 150 to 600 mm. In addition, the corresponding double-pipe chamber system is also available.



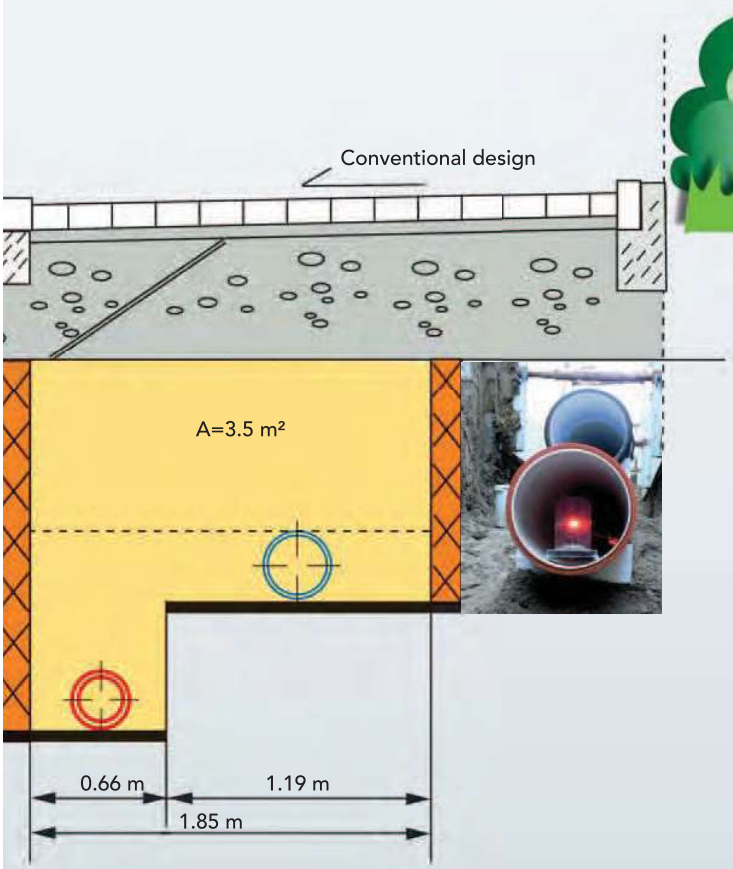
THE BENEFITS OF PIGGY-BACK INSTALLATION

- **Narrow trench**
- **Minimal excavation work**
- **Low soil exchange**
- **Optimized sealing of the gusset area**
- **Stable position**
- **Simple installation**
- **High laying performance**
- **Excellent operational behavior**

EPS MATERIAL

The large forces arising in the gusset area place correspondingly high demands on the material. That's why EPS (expandable polystyrene) was selected as the most suitable material: it's easy to handle in spite of its strong compression strength, will not rot and does not harm either ground water or the environment. EPS is a closed-cell hard polystyrene foam that has proven effective in road construction for many years, particularly under adverse soil conditions.





Bolsters

Single bolster

DN	Length m	Width mm	Height mm	Weight kg/m	Art. no.	€/unit
150	1	170	60	0.25	45490	**
200	1	225	78	0.35	45491	**
250	1	280	95	0.59	45492	**
300	1	335	113	0.88	45493	**
400	1	450	148	1.30	45494	**
500	1	560	179	2.14	45495	**
600	1	620	212	2.77	45496	**

** Price upon request

Twin bolsters

DN	Length m	Width mm	Height mm	Weight kg/m	Art. no.	€/unit
300/200	1	225	150	0.70	45452	**
400/200	1	225	143	0.72	45453	**

** Price upon request

Bolsters for other pipe systems, e.g. KG, stoneware, etc. upon request!

WIDE RANGE OF APPLICATIONS

- especially useful in adverse soil conditions (e. g. ground water, peaty soil)
- no soil improvement measures necessary
- permanent maintenance of a minimal slope
- reduction of pipe stress under extreme loads