SEWAGE AND ENVIRONMENT

Sewage and Environment

Pipes, manholes and special constructions made of eco-friendly PE and PP

GEOSYNTIA

FRANK

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To avoid pollution of groundwater and the environment during transportation or storage of contaminated waste water, piping and storage systems must meet very high requirements.
With its high-quality piping, manholes and special structures made from environmentally friendly PE and PP, FRANK offers reliable solutions: The welded or plugged systems manufactured from our tried-and-tested, spiral PKS® pipes, are permanently sealed, chemical resistant, corrosion-resistant, break-proof and easy to maintain while offering a service life of 100 years.
Our pipes, manholes and structures are used around the world for example for wastewater transport, rain retention, surface water collection or fresh air supply.

PKS® pipes

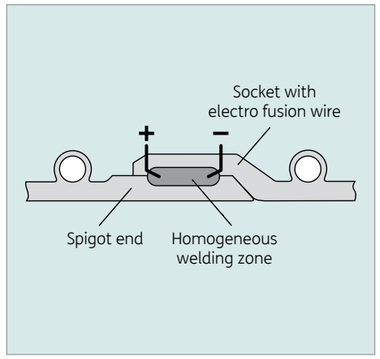
Versatile. Highly resistant. Weldable.

PKS® pipes are lightweight, chemically resistant, corrosion resistant and break-proof. They are manufactured in the dimensions DN 300 to DN 3500 by means of a winding process that uses tough and durable PE or PP material.
Thanks to the variable profile geometry, PKS® pipes can be optimally adapted to static requirements or external stresses. In addition, they are equipped with an inspection-friendly bright-coloured inner pipe surface.
Due to their excellent properties and ease of processing, PKS® pipes are excellent basic components for the production of moulded parts, manholes and special structures.

Secure connections

PKS® pipes can be welded: This allows the entire pipe system to be connected homogeneously and permanently sealed. (Root penetration and ex- and infiltration are therefore excluded) PKS® pipes ranging from DN 300 to DN 2400 feature an integrated socket on one side with integrated electro fusion wire. Pipes larger than DN 2400 are made by the extrusion welding process according to DVS 2207-4.

From DN 300 to DN 2400 with integrated electro fusion wire



Homogeneous connection by electro fusion welding

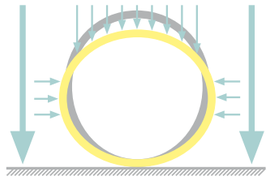
Advantages

- Easy to install and economical
- Robust, break-proof and long-lasting
- Permanently tight pipe connections
- Resistant to aggressive wastewater
- Resistant to corrosion by foreign substances or bacteria
- Resistant to deposits due to anti-adhesive surface
- Extremely abrasion resistant
- Excellent hydraulic performance due to smooth inner surface finish (k < 0.05 mm)
- Impact-resistant and UV-resistant
- Inspection-friendly thanks to bright inner surface F 100+ (DIBt approved)
- Environmentally friendly – made of PE and PP (DIBt approved)
- Easily extendable

Durable and break-proof

PKS® pipes with variable profile types

PKS® pipes are flexible and break-proof, and can even compensate short overloads of the pipe system without consequential damage. After the load has been removed, they fully return to their former shape.



PKS® pipes compensate external forces by means of a defined deformation

PKS® pipes boast a high level of long-term ring stiffness thanks to a variety of special profile types. PKS® pipes can therefore always perfectly adapt to expected load conditions.

VW profile

VW profile, stepped

The VW (solid-wall) profile type can be produced according to static specifications in different wall thicknesses and gradations.

Operational area

- Production of manholes, bends and other structures or components
- Production of cylindrical container with graduated wall thicknesses of up to 400 mm
- For pressure-loaded pipelines
- Production of ventilation pipes

PR profile

PRO profile

The PR and PRO profiles offer excellent ring stiffness combined with extremely low pipe weights.

Operational area

- Standard for underground sewer pipes
- The PRO is best used where installation is difficult or pipes are exposed to extreme loads
- Production of ventilation pipes

PKS®$_{plus}$ profile

SQ profile

The PKS® $_{plus}$ profile types and the SQ profile achieve very high long-term ring stiffness due to the compact profile structure. They are therefore used in systems exposed to very high external stresses.

Operational area

- Production of manholes and other fittings with pipe penetrations
- For underground sewer pipes exposed to high external stresses
- For leakage monitoring

TSC® PIPE

Pipe system with plug connection for dirt, rain and surface water

TSC® Pipe (Twin Seal Connection Pipe) is a high quality pipe system made of PE or PP with secure plug connections. The system offers the same exceptional features as our PKS® pipe systems, but differs in the connection technology used.

Advantages

- Pipe system with double safety for durable watertight plug connections (tested according to DIN 4060 - requirements were significantly exceeded)
- Integrated, shift-proof double seal, made optionally from EPDM or NBR
- Easy handling, economical and environmentally friendly
- Highly stable construction and low weight due to the special profile design
- Extremely abrasion and impact proof, resistant to UV light
- Resistant to aggressive wastewater and corrosion caused by foreign substances or bacteria
- Excellent hydraulic performance due to smooth inner surface finish
- Expected service life of at least 100 years
- Different materials, colours and SN classes available
- Dimensions: DN 400 – DN 1600

Tight connection – high security

Permanently tight pipe connections are achieved thanks to the double seal that is secured against slipping. Leak tests according to DIN 4060 have been certified by the MPA Darmstadt, showing that the minimum requirements are significantly exceeded.

Plug-in system with double seal

Applications

The TSC® piping system is used for the disposal of rainwater, surface water and waste water in free gravitational flow.

High level of stability

Advanced materials – combined with a variety of profile types – ensure maximum stability and flexible adaptation to project-specific stress situations (transportation, storage, installation and operation).

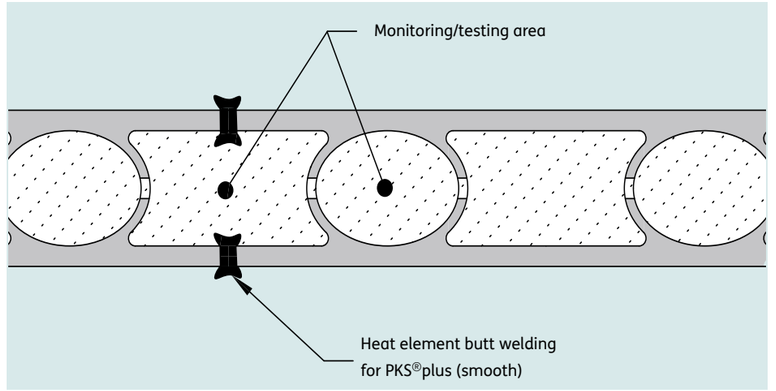
Durable and easy to maintain

The outer surface of the pipe is UV resistant while the coextruded, bright-coloured inner surface facilitates control and camera inspection.
The smooth, anti-adhesive inner pipe surface of the TSC® pipes ensures high hydraulic capacity and significantly longer cleaning intervals.

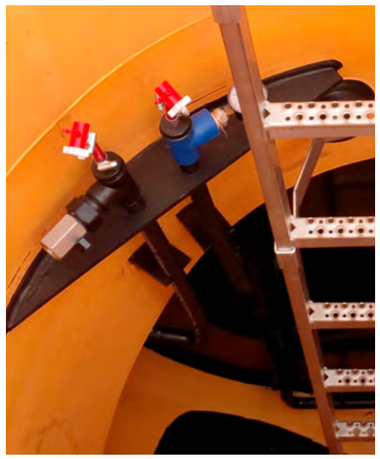
PKS® Secutec

Seamlessly monitorable double pipe system to protect the environment

PKS® Secutec is a pipe system that has been specially developed for leakage monitoring. It has a clearance between the medium-carrying inner layer and outer layer that can be used for pipe supervision in common monitoring processes. PKS® Secutec is therefore suitable for applications subject to monitoring, such as the handling of groundwater pollutants. PKS® Secutec has passed all tests successfully and is the first pipe system of this kind to achieve DIBt approval. PKS® Secutec pipes are available from DN 300 to DN 3500



Connection of PKS® Secutec pipes (example: heat element butt welding)



PKS® Secutec system manhole with connections for leakage monitoring

Applications

- Sewage pipelines through groundwater protection zones
- Underground pipelines for water polluting substances
- Leachate drain lines in landfills
- Process lines for hazardous chemicals
- Other pipelines that require special leakage monitoring

Leakage monitoring variants

- Recurring leak checks by means of vacuum methods
- Continuous leak monitoring by means of electric leakage detection system

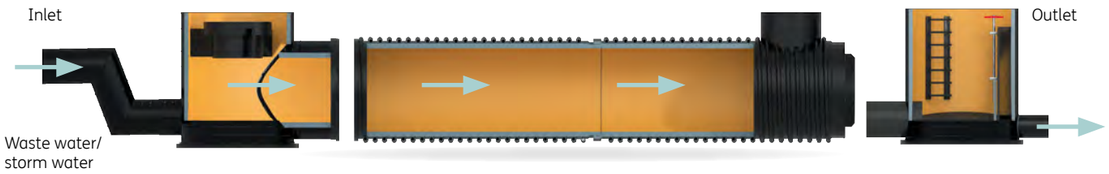
Special Features

- DIBt approval for pipe system and welding connection
- Meets the requirements of the DWA A-142
- Excellent safety thanks to double-wall structure and integrated monitoring system
- Leak detection also for welded joints
- Available in DN 300 to DN 3500
- Excellent chemical resistance
- Light weight for easy handling
- High abrasion resistance
- Expected service life: minimum 100 years
- Recyclable

PKS® Storm Water Tanks

Storage and provision of rain, service and fire water as well as leachate from landfills

PKS® storm water tanks are designed for flexible use: thanks to their modular design, they can be easily customised for a wide range of applications. In addition to the temporary storage of storm water, the tanks can for instance be used for the retention of process water and leachate from landfills, or the provision of service and extinguishing water.



Typical designs

Single-pipe tank with revision manhole and two end covers

U-shaped tank with end cover and revision manhole

Tank consisting of two connected parallel pipes with revision manhole

Manifold structure with connecting pipe and revision manhole

Advantages of PKS® storm water tanks

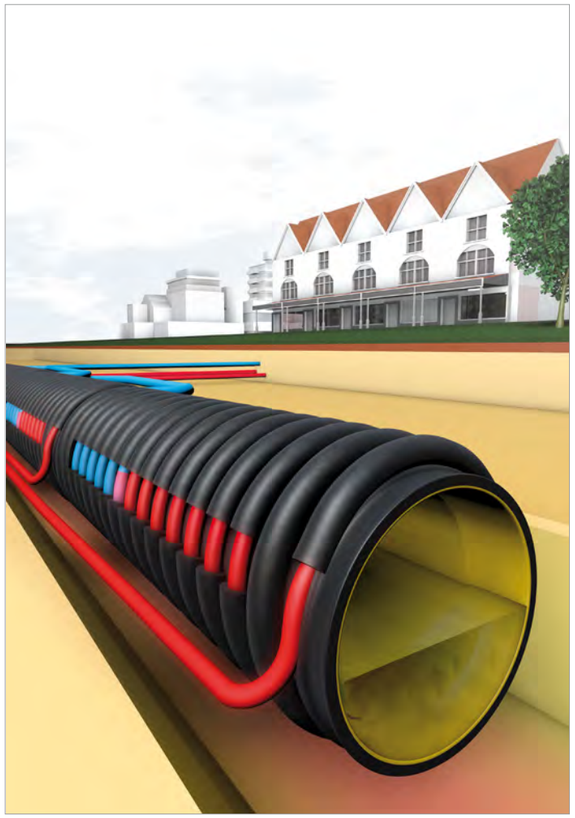
- PKS® storm water tanks are designed for easy and cost-effective customisation to suit any needs.
- The individual structures are pre-assembled at our factory for quick installation on site, saving time and money.
- PE and PP are materials that are resistant to abrasion and offer excellent hydraulic performance (smooth inside finish, k < 0.05 mm). They are extremely durable, require only minimum maintenance and are therefore highly cost-effective.
- PKS® storm water tanks can be joined by means of electrofusion sockets. This ensures permanent and reliably tight connections, which are of course indispensable for the safe storage of chemically contaminated waste water.
- Thanks to their lightweight design, the system components can be transported and installed with "light" construction machinery, which makes them suitable for use in difficult-to-access or soft terrain.
- PKS storm water tanks have good bending properties and are therefore break-proof, flexible and resistant to deposits. We offer properly dimensioned solutions with static strength properties suitable for high superimposed loads and poor ground conditions.
- The anti-adhesive inside surface prevents deposits in the pipe.
- The bright inner surface produced by co-extrusion makes inspection particularly easy. Thanks to the firm bonding of the layers, they cannot separate.

PKS-THERMPIPE®

Sewage pipe system with additional heat recovery

The PKS-THERMPIPE® system does much more than transporting your wastewater safely to the sewerage system. The innovative solution could best be described as a "horizontal geothermal probe with wastewater turbo charger", as the PKS-THERMPIPE® system also extracts heat from both the wastewater and the ground.

Wastewater in pipes does not only heat up the pipeline but also the ground around it, which is charged like a battery by the energy produced by the waste water. This energy, which is normally wasted, can now be extracted and utilized with the PKS-THERMPIPE® system. A heat transfer medium is fed through a support pipe wound around the outer jacket of the sewage pipe. This medium extracts both the energy contained in the wastewater and the ground surrounding the pipe.
Thanks to the simultaneous use of two heat sources, the PKS THERMPIPE® system is independent of day lines or irregular wastewater discharges. Constant heat extraction is therefore guaranteed.



Requirements for wastewater energy recovery

- Densely developed residential or industrial area with relatively large wastewater volumes (dry weather flow ≥ 15 l/s).
- Energy consumers with high heat requirements (≥ 50 - 200 kW) such as schools, kindergartens, public administration offices, shopping centres, hospitals, hotels, public swimming pools, large residential apartment blocks, etc.
- Relatively short distance (approx. 100 m, max. 500 m) between heat recovery plant and wastewater pipe
- System temperature for heat recovery (return pipe) not exceeding 50 °C (the lower, the better)

PKS® Leachate Systems

For capture and seepage of groundwater and surface water

Our installation-friendly PKS® leachate water systems for the collection of ground and surface water can be easily and flexibly adapted to specific customer requirements. In addition to the design and dimensioning (from DN 300 to DN 2400), the hole pattern can also be produced according to customer specifications.

Advantages

- Flexible and adaptable structure
- Different profile types enable cost-optimized design
- Available as fully or partially perforated pipe in 6 m length
- Easy to install thanks to moulded socket and spigot
- Circular and clean hole pattern, since holes are drilled and reworked in a cold state
- Variable hole cross-section with at least 100 cm²/m inlet surface, wherein the standard is defined as d 13 mm; special perforations of d 5 to d 15 mm in different hole geometries are possible
- Low water ingress resistance, because holes are only drilled between the profiles or in areas of reduced wall thickness
- We also supply the appropriate geotextiles for sheathing.

PKS® Ventilation Pipes

Optimal for underground and aboveground installation

Thanks to their unique construction, PKS® ventilation pipes are especially suitable for underground and above-ground installation outside of buildings. This allows very complex tube geometries to be implemented simply and inexpensively.

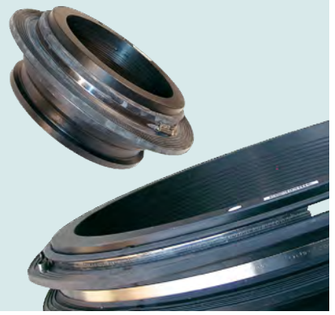
PKS® ventilation pipes
from DN 300 to DN 3500

We use the materials PE and PP as standard. Depending on requirements, we deliver PKS® ventilation pipes also from special materials with for example electrically conductive, flame retardant or antimicrobial properties.
The system can be plugged or welded. Welded PKS® ventilation pipes are particularly well suited for laying in ground water, since no water can penetrate into the homogeneously connected ventilation system.

For connection to buildings, we provide both flange connections and special pressure-tight wall connections.

Pressure-tight wall integration in concrete structures

FRANK wall feed-throughs ensure pressure-tight, high tensile incorporation of PE pipes into concrete structures. The integrated electro fusion wire creates a permanent connection between pipe and socket.



Manholes and special structures from PKS® pipes

Especially versatile

PKS® pipes are easy to process. What's more, they can be cost-efficiently implemented in almost all conceivable geometries.

Due to the low weight, PKS® pipes are easy to handle during transportation or at the construction site.

Examples of applications

Y-piece from PKS®plus pipe

Transition to oval profile with welded haunch made of PE plates with tight-connection wall integration

Transition of circular PKS® pipe to rectangular duct including reinforcement

Storage tank including connections made from PP

Inspection shaft with parallel angled channel

Inlet structure with floating skimmer

PKS® inliner pipe prepared on skids for fast installation

Building connection with underlying stainless steel flange

Precast segmental bend and distribution channel for ventilation

Insulated ventilation pipe with transition to rectangular building connection

Prefabricated junction structure

Prefabricated pipe geometries

CHEM 300

Extremely stable drainage system with PE-lined reinforced concrete slot unit

CHEM 300 drainage system is an innovative combination of the advantages of two products proven on the market: the Pfuhler slot channel made of reinforced concrete and the PKS® piping system made of PE 100.
The pipe system can be permanently sealed by welding and is extremely stable thanks to the reinforced concrete.

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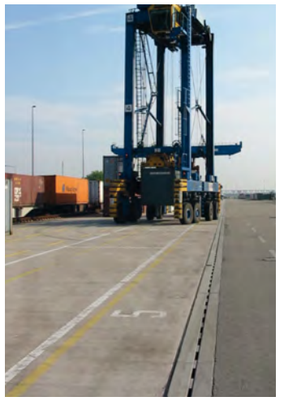
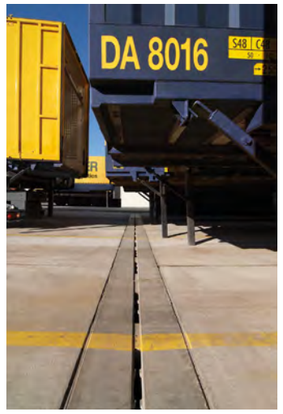


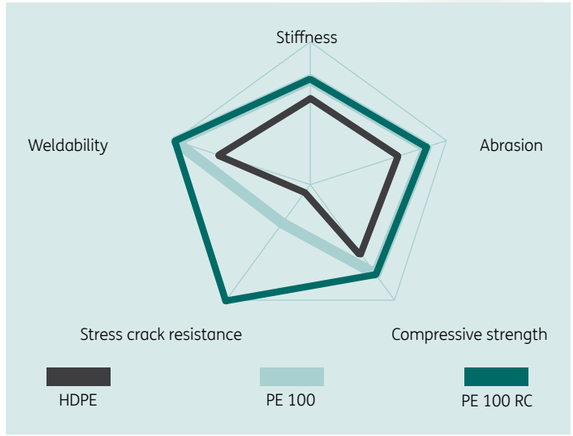


SURE INSPECT RC

Resilient sewer pipe system made of PE 100-RC for small diameters

SURE INSPECT RC is a cost-effective sewer system from the resistant PE 100-RC with inspection-friendly, coextruded yellow inner layer.
We supply pipes and segmented fittings from d 160 to d 630 mm in SDR 17, also in other SDR classes on request.

Cost-efficient installation
Due to its high resistance, SURE INSPECT RC can be laid without a sand bed. This saves costs for pipe installation since the embedment can be simply filled with the excavated material.



PE 100 RC
The PE 100-RC material has proven its outstanding characteristics in the production of pressure pipes in civil engineering for many years. The resistance to stress cracking, point loads and slow crack growth is much higher than in conventional PE types.

The adjacent graph illustrates the difference compared to other PE raw materials.

FRANK

Personal. Flexible. Competent.

Plastic pipeline systems are an indispensable part of today's world. They are widely used in gas and drinking water distribution systems, cooling and heating installations, sewerage networks and many other fields.
Our system solutions made in plastic have stood the test of time: For over 50 years, the FRANK Group has been among the leading suppliers of plastic pipes – offering everything from standard straight sections to custom-engineered solutions.
Do you have any queries? Please do not hesitate to contact us!

We supply tried and tested plastic piping systems made in PE, PP, PVDF and ECTFE that are being optimised and improved on a continuous basis. In addition to tubes, pipes and fittings, we provide electrofusion and other joining equipment, plastic valves, semi-finished goods, geosynthetics, parts for biogas plants and components for shallow geothermal systems.

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