

KMG LINERTEC

LARGE-DIAMETER TRENCHLESS PIPELINE RENEWAL FOR CUSTOM SHAPES





KMG LINERTEC – CUSTOM-MADE HIGH-TECH REHABILITATION SOLUTIONS

Under the SEKIUI SPR group, KMG LinerTec has been established to promote the advanced, environmentally friendly SPR™ Technology for trenchless pipeline renewal in Europe and the Middle East. The core competence of KMG LinerTec is the renewal of large-diameter and custom-shaped pipes.

With its headquarters in Glebitzsch near Leipzig, Germany, KMG LinerTec offers technical know-how and support in all aspects of the Japanese SPR™ Technology.

A team of experts is developing new projects and applications for new markets. KMG LinerTec obtains certification of SPR™ Technology as well as ensuring compliance with installation standards. KMG LinerTec has also established a network of partners in Europe and the Middle East to promote spiral wound pipeline technology.

Another core competence of KMG LinerTec is the execution of renewal projects. With its own in-house engineers and state-of-the-art equipment, the international team supports the whole process from planning through to operation of the renewed pipeline.

During the planning process, local challenges are identified and risks are calculated. Longstanding experience ensures cost-efficient purchasing of materials and smooth on-site workflow. Experienced experts control the renewal process, employing the tried and proven spiral wound equipment, and also train local specialist staff on-site.

SPR™ TECHNOLOGY

SPR™ is a spiral wound trenchless pipeline renewal process designed for the renewal of large-diameter accessible pipelines up to 5000 mm. SPR™ utilizes steel-reinforced interlocking PVC profile strips sealed in place by a high-pressure grout. The installation equipment can be utilized via standard manhole access points without site excavation. The Japanese SPR™ Technology can also be installed in vertical applications such as wet wells, access shafts and other large-diameter structures.

The SPR™ process is unique as it can provide a customised structural solution to aging pipelines. It can be engineered to correct hydraulic anomalies as well as restore the slope of the original pipe.

The interlocking edges of the profile create an impermeable mechanical lock that can withstand strong deformational forces. SPR™ liners have been tested in accordance with industry standards and meet or exceed the standards for spiral wound PVC Profile Wall Liners ASTM F – 1697-02 and F 1741-02a. Furthermore the SPR™ PVC profile has a Manning's n of 0.01.

Benefits of SPR™ Technology at a glance

- Renewal of accessible, large-diameter pipes (800–5000 mm)
- Renewal of circular, non-circular and custom shapes
- Truly trenchless – requires only standard manhole entry
- Designed for installation in live flow conditions
- Negotiates curves and bends
- Improved flow with smooth PVC material (Manning's n of 0.01.)
- Environmentally friendly installation and application
- Over 400 km successfully installed worldwide





INSTALLATION PROCESS – MINIMAL IMPACT ON THE ENVIRONMENT

The SPR™ installation process can be divided into the following stages:

1. Inspection and cleaning of the host pipe
2. Winding process
3. Installation of the bracing system
4. Grouting

Inspection

Prior to the SPR™ winding process the host pipe is inspected by camera and all incrustations and debris are removed by hydraulic jet cleaning.

Winding process

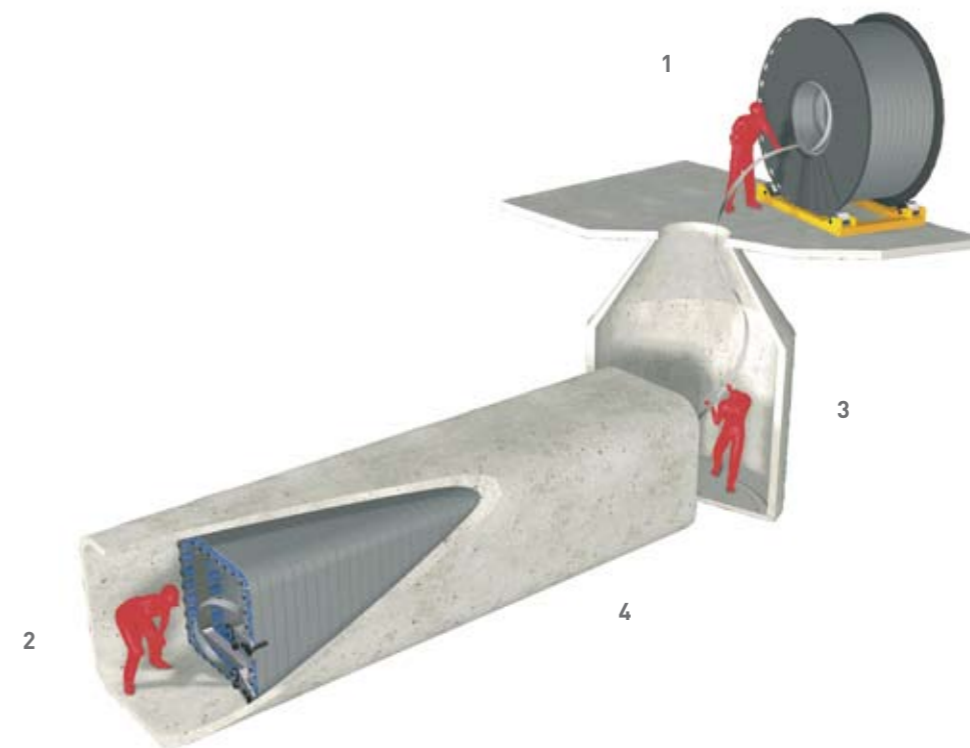
SPR™ profile is fed through the manhole into the winding machine placed in the host pipe. The winding machine winds the PVC profile to the specified form and interlocks the PVC strips to form a new water-tight pipe. The winding machine is moved on to the next shaft by its forward momentum. For longer renewal segments the profile is cut off at the intermediate shaft and the winding machine is installed downstream of it to continue the winding process.



Inspection



Winding process



Installation process at a glance

- 1 SPR™ PVC profile is unreeled and fed into the winding machine.
- 2 The SPR™ winding machine pulls the SPR™ profile into place and engages the dual locking mechanism.
- 3 SPR™ is installed via standard manhole entry.
- 4 After the SPR™ profile has been locked into place, the annulus is grouted with a special high strength grout.

Bracing system

After the winding process the bracing system is installed. The bracing material is lowered through standard manhole openings. In the next step the bracing system is set up to provide structural support during the grouting process and positions the SPR™ profile in the host pipe according to engineering specifications.



Bracing system

Grouting

The grouting process is subdivided into the injection of grout into the annulus between the host pipe and spiral wound PVC profile and curing of the special high strength grout. Finally the bracing system is dismantled and the renewed pipe is ready for service.



Grouting

EU PREMIERE IN SZCZECIN

Szczecin is the first city in EU to profit from SPR™ Technology.

When the tender for the renewal project in Szczecin, Poland, was first issued at the beginning of 2008, GRP short-pipe lining was originally specified. After some extensive research by the customer, however, it was found that it would be very difficult to maintain the required water flow rates using the chosen technique. Severe deformation of the old pipe, which was not identified during the planning stage, meant that if a GRP short-pipe lining was used the diameter of the renewed pipe would be much smaller, and so reduce the capacity of the new pipeline. Another challenge was posed by the fact that the pipeline being renewed in Szczecin was a main collector in the city centre, where it would be impossible to construct a dewatering system. Even though a large pit for the GRP lining had already been dug, at the last minute the customer decided – based on the new demands faced – to opt for the first-ever EU use of SPR™ Technology.

The masonry-lined combination sewer was built over a century ago. The condition of the sewer had deteriorated severely in recent years. As a result of

continuous traffic and other external loads, longitudinal cracks had formed along the crown of the pipe, leading to increasing deformation of it. Renewal had become a matter of urgency. There were also a large number of deposits and other obstacles protruding as much as 50 cm into the pipe. Consequently, it was clear that thorough preliminary prep work would have to be carried out prior to the renewal process.

All work was carried out by the team comprising workers from the local Polish agent of SEKISUI SPR and Japanese technical specialists. The renewed sewer is beneath one of the main streets in Szczecin, and collects the storm-water and sewage from all the smaller surrounding systems. Work had to be interrupted several times due to flooding and above-average rainfall, and lost time had to be made up at night. However, since SPR™ can also be applied in live flow condition, the installation could be resumed without problem following the enforced breaks.

Despite the very difficult weather conditions, the EU premiere of SPR™ Technology was successfully completed within about two months.



Everything from a single source. SEKISUI SPR Group is synonymous with superior solutions for underground infrastructure worldwide. SEKISUI SPR offers outstanding and environmentally sustainable technologies and services for supply and drainage through its global sales network. Customers profit from the broad portfolio including trenchless rehabilitation, vacuum sewer systems and pipe inspection. With experts in the rehabilitation, construction and maintenance of underground infrastructure systems worldwide, SEKISUI SPR offers all services from a single source.

THE BEST IN ONE THE BEST FOR YOU – WORLDWIDE



Modern urban life would be utterly impossible without underground infrastructure. However, it is becoming apparent that underground infrastructure systems worldwide are deteriorating substantially as a result of age and a steady increase in traffic loads. The also rising demands on sustainable and environmentally-friendly urban development pose a major challenge to local authorities. SEKISUI SPR offers the right solutions to meet those challenges. Trenchless technologies permit renewal by rehabilitating and improving the existing infrastructure without protracted construction works and without modification of the cityscape. It is also possible to expand and maintain existing infrastructure systems without excavation. Trenchless technologies guarantee a faster, more cost-effective and environmentally-friendly solution compared to replacement.

SEKISUI SPR employs some of the world's leading technical and operational infrastructure specialists, and is thus in a position to offer a solution for all requirements, from planning through to construction. In delivering those solutions, SEKISUI SPR operates in three divisions: Sales & Support, Trenchless Infrastructure Solutions and Construction. In concrete terms, this provides for a global interchange of experience between individual experts to devise the optimum infrastructure solution for the specific location.

SEKISUI SPR combines the international underground infrastructure competences of the SEKISUI Chemical Corporation (Osaka) and the Hong Kong-based Chevalier Group. It is already represented in over 40 countries on 4 continents.

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■ TECHNOLOGY ■ SALES & SUPPORT ■ CONSTRUCTION

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