REPIPE LINING METHOD FOR RENOVATION OF SEWERAGE PIPING NETWORKS
Repipe Oy

The lining method developed by Repipe Oy can be used to renovate old sewerage networks back to good-as-new condition. When lining the pipe, a ready-made soft pipe is installed in place. A cost-efficient implementation method, high-quality materials and professional engineers guarantee a maintenance-free solution which lasts decades.

The Repipe method means you can avoid scheduling worries, inconvenience for residents, opening up of structures and high costs traditionally associated with piping renovations. The Repipe method is a 100% genuine lining method wherein a slippery-surfaced epoxy pipe is installed inside the piping along with branchtees which reinforce branches at joints. The wall thickness of the new pipe is 3...5 mm.

The method is completely different from that of coating piping networks, which does not achieve the same properties as the Repipe method, which results in a flexible and seamless pipe which can also withstand earth pressure. Unlike coating, the lining is self-supporting, meaning it can be used to repair piping which contains areas of corrosion, holes and cracks.

Repipe Oy is a Finnish family-owned company which values high quality, customer satisfaction and honesty. The Repipe lining method has been used to renovate sewerage networks in over 2,000 residential properties.

REPIPE LINING IN BRIEF

Using the Repipe lining method, old sewerage piping is renovated through lining and branches are reinforced using branchtees. The piping is cleaned and a video is recorded of the piping in order to observe any possible anomalies in the piping. They are taken into account when lining.

The liner, which is treated with epoxy, is blown into the sewerage pipe using pressurised air. Once it has hardened, the liner forms a new pipe. Branches in the piping is reinforced using branchtees developed and manufactured by Repipe, and which guarantee a seamless result. The completed work is video recorded and approved.

The materials used are certified in Europe by manufacturers and approved by authorities. The entire work process is certified by VTT Technical Research Centre of Finland.

Due to the challenging nature of lining work, we use only our own personnel and choose not to subcontract.

APPLICATIONS

The Repipe lining method is suitable for use in the renovation of lateral, vertical, ventilation, ground, property and rainwater drains in e.g.,
- Apartment blocks
- Row and detached houses
- Office buildings
- Industrial properties

The lining is suitable for piping with diameters between 50...225 mm. In certain cases it is also possible to line pipes with a diameter of 32 mm. The materials of piping to be lined can be e.g., cast-iron, plastic or concrete.

BRANCH REINFORCEMENTS

Hat profiles, e.g.,
DN 50, DN 70, DN 100, DN 150

Single branches, e.g.,
DN 70/50 × 90 and 45 degrees
DN 70/70 × 90 and 45 degrees
DN 100/70 × 90 and 45 degrees
DN 100/100 × 90 and 45 degrees
DN 150/70 × 90 and 45 degrees
DN 150/100 × 90 and 45 degrees
DN 150/150 × 90 and 45 degrees

T-branches and multilevel branches, e.g.,
DN 70 × 70/70 × 90 and 45 degrees
DN 100 × 70/70 × 90 and 45 degrees
DN 100 × 100/70 × 90 and 45 degrees
DN 100 × 100/100 × 90 and 45 degrees

Three-level branches, e.g.,
DN 100 ×100/70/70 × 90 degrees
DN 100 ×100/100/70 × 90 degrees
The Repipe lining method refers to a method of renovating old piping wherein a polyester liner is inserted into old piping along with branchtees, which are hardened to their final form using bicomponent epoxy. The end result is a pipe which is as good as new, and with a technical service life equivalent to that of a cast-iron pipe.

The procedure covers the cleaning and imaging of the pipe, necessary repairs to the pipe, the lining of the interior of the pipe using a polyester liner saturated with epoxy resin and the verification of the end result through video recording. The procedure also includes the coating of old floor drains from the inside or the installation of new floor drains.

A pipe which is lined is self-supporting and therefore independent of the old pipe. The new pipe can withstand earth pressure, meaning that lining can also be used in ground applications.

### LINING PHASES

1. **Protection**
   We carefully protect floor and wall surfaces, as well as access routes.

2. **Preparatory work**
   We detach water fixtures, such as toilet seats, to clear the way for the lining.

3. **Cleaning the piping**
   The sewerage piping is cleaned carefully, usually mechanically or using pressure washing. Blockages, deposits and other impurities are removed so that the original interior surface of the pipe is visible.

4. **Imaging**
   The sewage line is video recorded carefully. Any possible cracks, holes and dents are methodically documented, since they affect the implementation of the lining.

5. **Lining**
   The actual lining of the piping begins once the pipes are clean, dry and have been video recorded. A polyester liner of the correct dimensions and treated with bicomponent epoxy is blown slowly into the pipe using pressurised air. This phase is the most demanding, and requires professional skills. Branch connections in the pipeline are time-consuming since branch reinforcements or hat profiles which are a precise fit must be installed. Air pressure is kept in the pipe until the epoxy has dried (usually overnight) and the pipe has taken on its final form.

6. **Documentation and approval**
   The completed lining is video recorded and a record of installation is filled out, after which the supervisor approves the work. The video is stored as a digital recording.

7. **Finishing**
   Water fixtures and drain traps are installed back into place. The site of installation is cleaned.

### ADVANTAGES OF THE REPIPE METHOD

A sewerage piping network renovated using the Repipe method is seamless, self-supporting and silent. The smooth interior surface does not create blockages; the new piping is practically maintenance-free. If necessary, the piping can be cleaned mechanically or using pressure washing. The manufacturer’s instructions are followed during maintenance procedures.

The technical service life of a lined pipe is approx. 50 years – the same as for a cast-iron sewerage pipe.

**Resident-friendly installation**

The lining of the piping is carried out using existing openings, such as toilet bowls, floor drains or maintenance hatches. In some cases, installation holes are made in piping which is visible (e.g., in floors).

There is no need for time-consuming, arduous and noisy structural demolition work. The method is very resident-friendly – the home or apartment can be used during the renovation, since there is no dust or demolition waste, and the need for protection is minimal.

The time needed to work on the lining is just a fraction of that needed for traditional piping renovation, which consists of several work phases. A rule of thumb is that lining takes one week per vertical pipeline in a property.

**Cost-efficiency**

The Repipe method’s competitive pricing is based on several factors. Advanced planning of the implementation minimises unnecessary work phases and waiting. Lining does not require labour-intensive demolition or construction work or the removal of waste.

Active communication between various parties (designer, contractor, supervisor, residents, client) ensures that the project is carried out on time and that the end result is of high quality.

Repipe employs only experienced professionals. Lining is a demanding job carried out by hand, wherein the end result is based on meticulous care and an understanding of all aspects of the work.

We offer lining at a project-based price. When a project is well-designed and up-to-date information on the site is available, the project progresses according to strict cost estimates and set schedules without unpleasant surprises. The share of additional work in a lining project is usually minor.
THE IMPORTANCE OF DESIGN

The service life of piping can span decades, and changes are often made to piping or original plans without updating the building’s information to match the end result. A lining project starts with the gathering initial data on the project and with professional planning. The older the property, the more important it is to update HVAC drawings before the piping renovation begins. This not only speeds up the installation but also allows for the accurate pricing and scheduling of the project.

Our experience and professional skills are available to you even in the design phase. We are happy to support designers, condition inspectors and property managers in order to find an optimal solution.

A lined sewerage pipe is a seamless entity from the floor drain to ground sewer. It is essential to pay special attention to pipe joints, making them watertight and smooth.

TECHNICAL QUALITY

The technical quality of the Repipe method is based on top-quality materials. We only use materials from well-known European manufacturers with extensive experience and whose certificates are up to date.

Branchtees
The most challenging part of lining from a technical perspective is the joining of piping, for example the joining of a vertical sewer to the ground sewer. Over the years we’ve come up with a solution for this which includes installation tools, hat profiles and branch reinforcements. We manufacture these ourselves in order to ensure their quality.

Drain traps in renovation sites
If necessary, we use drain traps which we’ve designed ourselves. One of the models is patented.

Drain traps in renovation sites

We manufacture hat profiles (shown here) and branch reinforcements by hand.

A quality liner is usually made of polyester. The liner is dipped in epoxy, run through a mangle to achieve the correct thickness and blown into the pipe using pressurised air. The pressurised air stretches the liner tight against the pipe.
REPIPE OY

Established in 2008, Repipe Oy is a family-owned company based in Porvoo which specialises in the renovation of sewerage piping networks using its Repipe lining method. The company's management and employees have extensive experience in the industry. The majority of our work is carried out in residential properties. We mainly work in the capital region.

Our work is guided by the aim of being the most competent and responsible actor in the field of piping renovations. We offer properties a renovation solution which is long-term, affordable overall and of high quality with regard to both materials and work. Our operations promote modern property management, which includes a methodical approach, cost-efficiency and the careful documentation of matters. Repipe Oy has a high credit rating.

CONTINUOUS PRODUCT DEVELOPMENT

The lining method is decades old, but development of the method, especially with regard to applications, is still active. Product development is an important part of our operations. We gain lots of practical information in the field and listen to customers' wishes and requests, and these guide our development work. Our partners in cooperation include Tekes (the Finnish Funding Agency for Innovation), VTT Technical Research Centre of Finland and Finnvera, a specialised state-owned financing company.

In one Tekes project we developed materials, methods, installation tools, documentation and an overall process for lining. One important focus of development is branchtees, which have traditionally been the weakest part of lining since they are so difficult to install and due to quality problems.

Repipe has patents including patent No. 121125 used in the renovation of floor drains.

QUALITY MANAGEMENT SYSTEM

We comply with the ISO 9000:2000 quality management system and requirements set by the ISO 14001 environmental management system.

CERTIFICATE No. VTT-C-7893-12

The certificate is based on product type testing and the inspection of the quality assurance system related to the product. The general procedures for certification are based on VTT Expert Services Oy’s certification system.

All the materials we use are approved. The certification process often includes user training provided by the manufacturer.

REFERENCES

The Repipe lining method has been used to renovate over 2,000 residential properties. We are happy to provide a detailed list of references upon request. References are also available on our website.

GUARANTEE

 Guarantees of 2-10 years are issued with our work. Guarantees for materials are in accordance with manufacturer instructions.