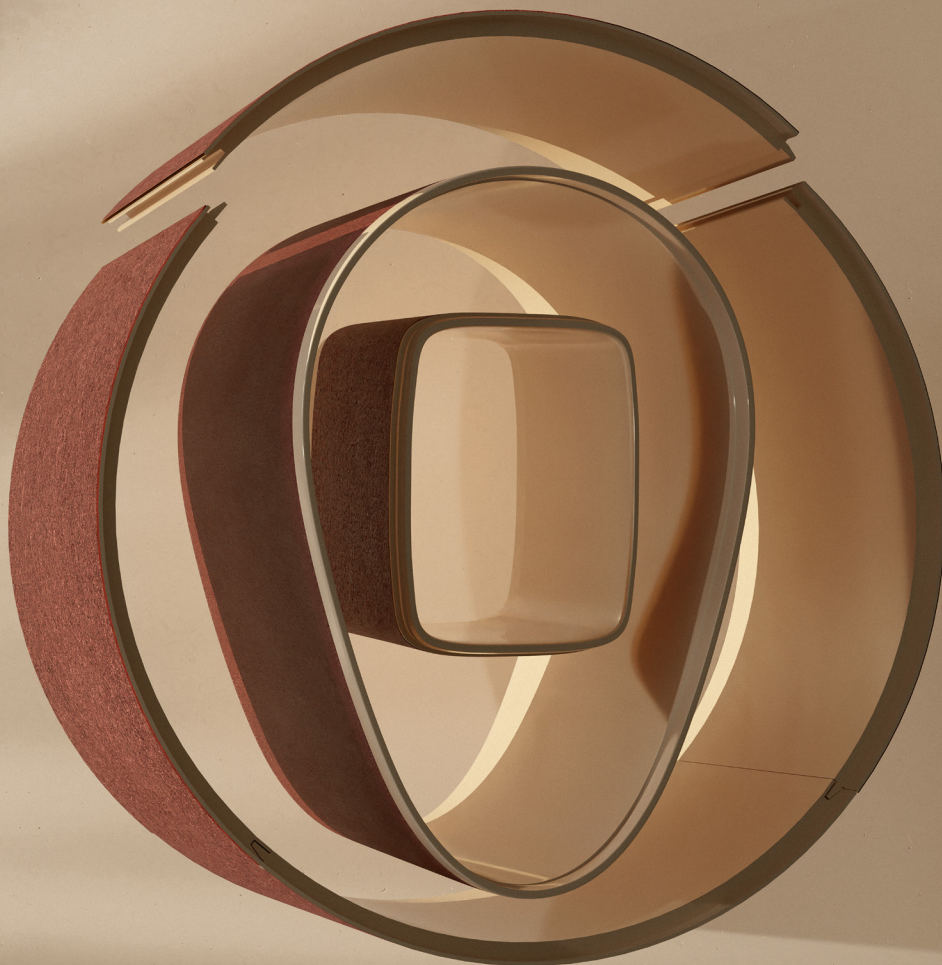





Fully-structural rehabilitation solutions

BEYOND THE
ORDINARY



Contents



About us

Technology

Features

Products

Applications

About us

01

Channeline has been providing bespoke structural glass reinforced plastic (GRP) lining systems since the early 1980s, during which time we have accumulated unrivaled engineering and manufacturing experience for both circular and non-circular buried infrastructure worldwide.

Our unique technology means we can create systems in any shape and any size, for the trenchless rehabilitation of sewers, tunnels, culverts, stormwater and other buried structures.

40 years

of dedicated infrastructure rehabilitation experience

30+

countries worldwide benefitting from Channeline's specialist solution

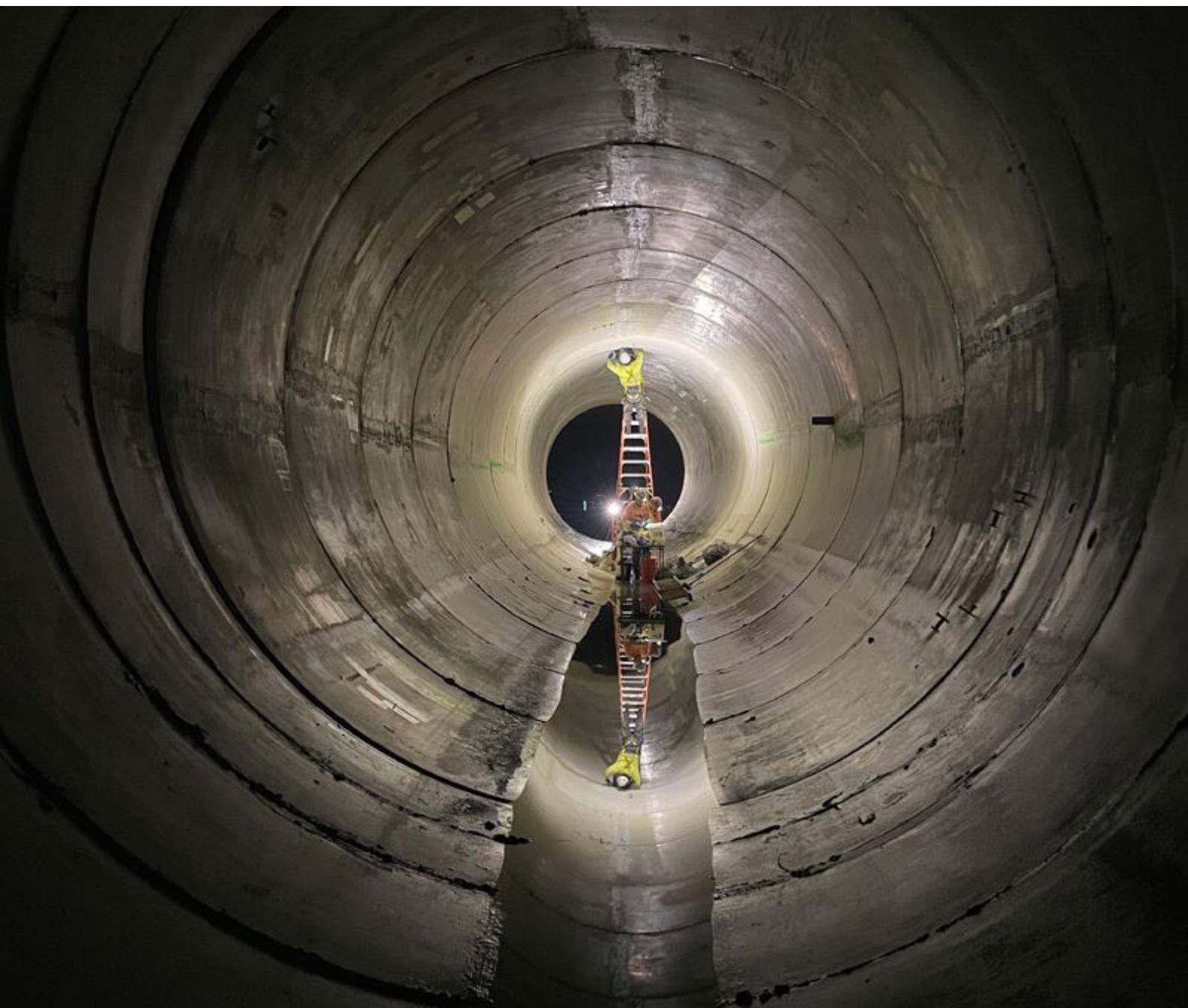
6,130 m

(20,111 ft) longest liner delivered

4.9 m

(16 ft) largest diameter liner delivered





Our vision

02

At Channeline, we envisage a future where the world's infrastructure thrives sustainably, supported by innovative solutions that extend its lifespan, ensuring the safety and prosperity of generations to come.

Our mission is to design, manufacture, and deliver innovative, high-quality, custom solutions that rehabilitate and enhance existing infrastructure assets for the long term.

How we work

03

01 Project evaluation

Our expert team take care to understand the requirements and nuances of each project. This usually involves surveying the host pipe, which we can help arrange, and a site visit.

02 Bespoke design service

Our in-house design team creates a custom design to fully satisfy project requirements and specifications. If required, the design can be validated using finite element analysis.

03 Manufacture, with quality in mind

The bespoke manufacture of product begins. Quality control is undertaken both during and on completion of the manufacturing process. If required, third party inspection and validation can be arranged.

04 Dedicated logistics support

The finished solution is prepared for shipping and dispatched to the project location. Our dedicated logistics team and client liaison provide end-to-end support until the arrival of goods.

05 Installation supervision

Training and support for installation can be provided by our team on request.



Our technology

01

Why GRP?

Glass reinforced plastic - also known as GRP or fiber glass - is an incredibly versatile material. It has low weight yet high strength, as well as resistance to chemicals, corrosion, UV and extreme temperatures, making it an excellent choice for pipework and lining systems.

What makes Channeline different?

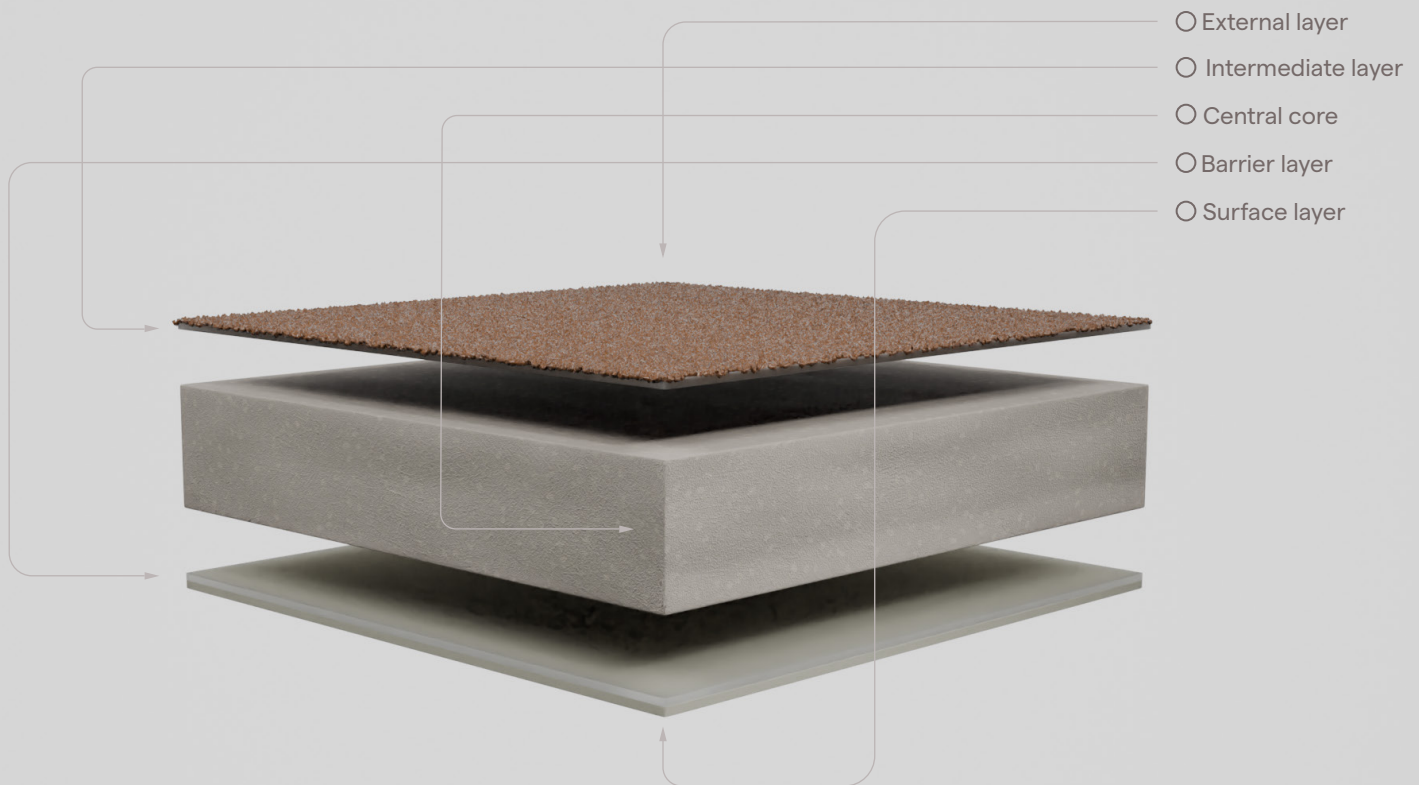
Our product differs from standard GRP hand or filament wound pipework in several fundamental and important ways. Standard GRP pipework consists of windings of layers of resin-saturated glass, which is impregnated with sand, achieving its stiffness by building up ever-increasing wall thickness.

Channeline derives its strength and stiffness through a different method, employing the mechanics of sandwich panel design, incorporating a unique polymer and aggregate core. This patented technology means that our product is thinner than standard GRP, maximizing possible cross-sectional area, while still achieving the strength required, and a 150-year service life.

Features of our product

- ☐ Custom made to any shape and any size
- ☐ 150-year service life
- ☐ Increased hydraulic capacity by up to 25%
- ☐ Thinner, maximizing cross-sectional area
- ☐ Excellent corrosion resistance
- ☐ Excellent impact and abrasion resistance
- ☐ Nesting transportation options
- ☐ Trenchless installation options





Our patented process

02

The first two layers of Channeline GRP (the surface and barrier layers) incorporate a corrosion barrier. This is manufactured from high-grade surface veil, precisely impregnated with resin, followed by several layers of thoroughly impregnated multi-axial engineered fabric and glass fibers.

The next layer is a central core, composed of a perfect blend of sand and resin. This is evenly applied to the exact thickness required.

The intermediate and external layers are formed using several further layers of multi-axial fabric, glass fibers and resin. This outer surface is treated with a bonded aggregate to enhance adhesion to the annular grout which is used during the installation phase.

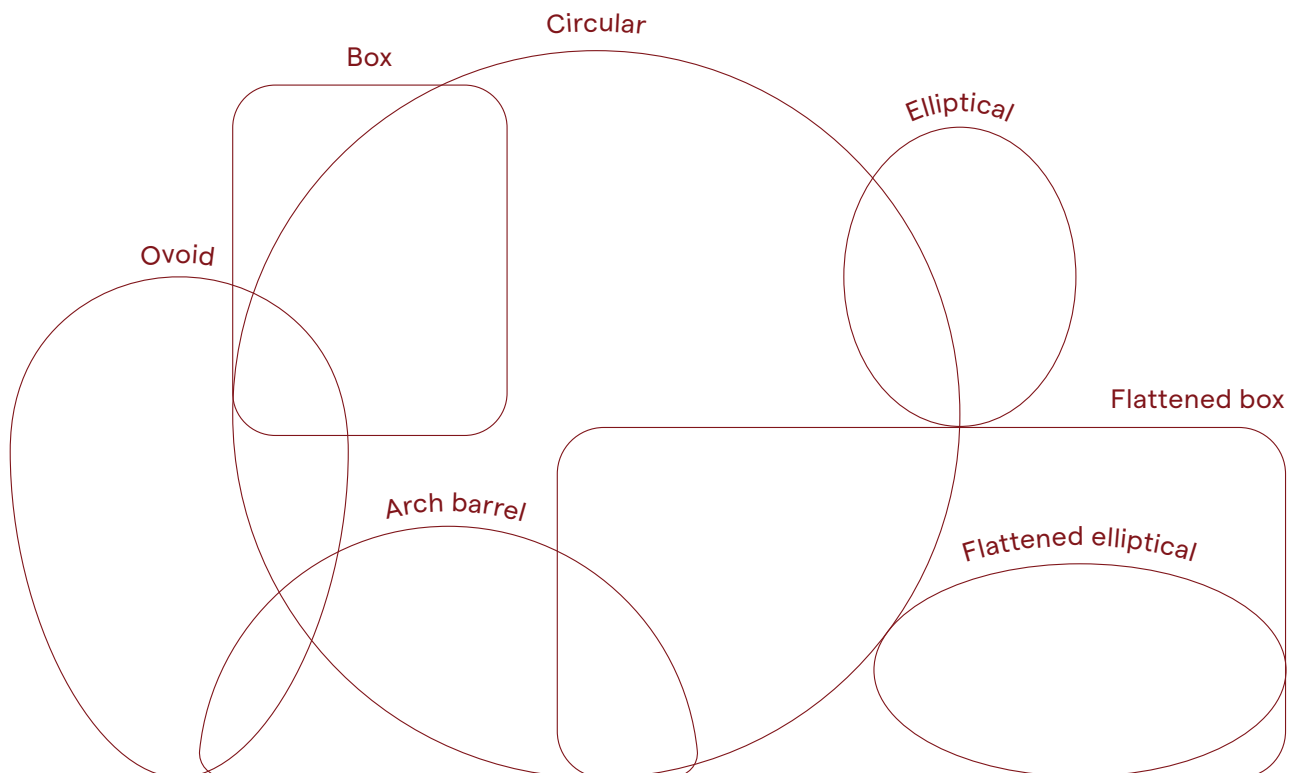
Our manufacturing process is carefully monitored and quality controlled to ensure exceptional bonding of all layers throughout the process, creating an exceptionally strong yet thin GRP product designed to satisfy the precise specifications for each unique project, efficiently and sustainably.

Any shape, any size

01

There really is no theoretical limit to the shape and size of Channeline products. Each product is custom designed and manufactured to fit the specific dimensions needed. Our unique technology even enables the creation of multi-segmental liners, facilitating the construction and transportation of exceptionally large or uniquely-shaped liners that would otherwise be impossible.

To ensure precision, a thorough site survey is conducted by authorities, contractors, or Channeline representatives. Following this, a proving template of the design is tested within the existing structure to validate the design. Once this is confirmed, manufacture begins.



Designed for longevity

02

Longevity is important to us, and a key part of our vision. We believe that it is our duty to extend the lifespan of infrastructure for as long as possible in order to ensure the safety and prosperity of generations to come.

Channeline products have been proven via rigorous independent testing to have a service life of at least 150 years. This is due to both its mechanical and material properties. Simply, its strength and its resistance (to many factors common within pipeline applications).



Increased hydraulic capacity

03

The hydraulic capacity of a sewer or culvert is dependent on the cross-sectional area as well as the surface roughness of the pipe.

Rehabilitation of an existing structure reduces cross-sectional area, and so hydraulic flow can be reduced.

With Channeline products, however, the improved surface texture of the rehabilitated pipe has been shown to improve hydraulic capacity. Generally, this is in the range of 12% to 25% (depending on the characteristics of the existing structure).

The extremely smooth nature of Channeline's GRP means that flow/pipe friction is reduced so much that it is effectively self-cleaning.

Not only that, thanks to our product being thinner than is possible with standard GRP, less cross-sectional area is lost than with competitor solutions using this method.



Corrosion and abrasion resistance

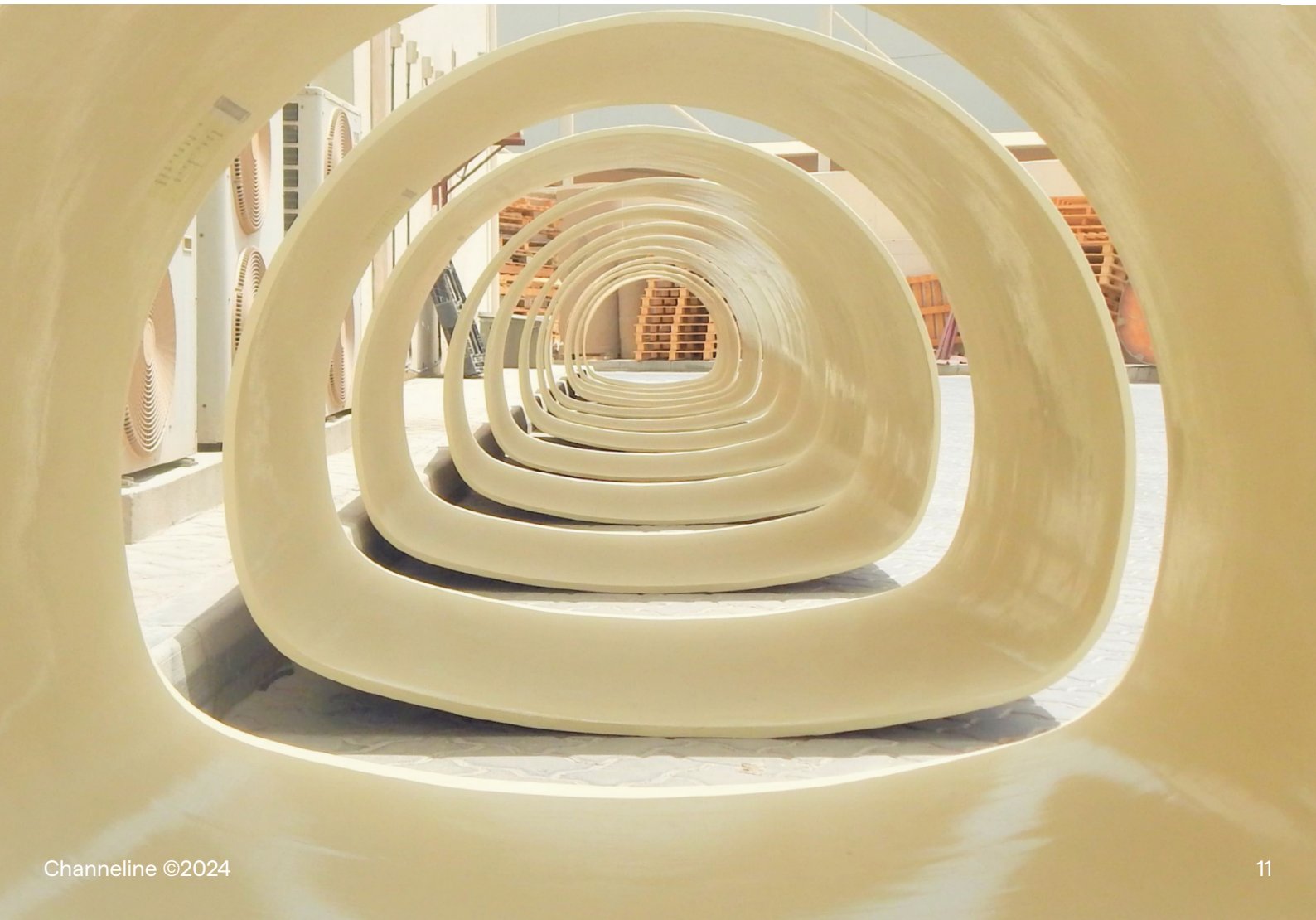
04

Most structural failures in sewers are caused by insufficient tensile strength. This reduction in strength is often accelerated by corrosive gasses and the oxidation of hydrogen sulfide into sulfuric acid.

Channeline liners are highly resistant to sewer gasses and most trade effluent.

The high-quality gel coat resins and surface veils used in the manufacture of Channeline panels also provide an exceptional degree of resistance to impact and abrasion. Wet abrasion testing comparisons with other liner methods show impressive and superior results.

Detailed information about our corrosion and abrasion resistance is available from your Channeline representative or by request at info@channeline.com.



Exceptional quality, guaranteed

05

At Channeline, our quality philosophy is simple: to produce the best GRP rehabilitation liners in the world. This means not only ensuring the quality of each and every liner that we make, but also to continually strive to further enhance the quality and performance of our products. This is a continuous process which actively involves everyone from senior management through to our people on the factory floor.

Channeline's in-house inspection and testing complies with standards recognized worldwide for the design, manufacturing and testing of GRP structural liners. Our quality control team performs daily batch testing of each material production run to verify conformity with a range of requirements.

This, together with coordination with third-party inspectors and external independent test laboratories ensures we deliver on our quality pledge.

Our assurance processes mean we're confident in the quality of our product; that's why we offer a standard guarantee of ten years. We also provide certificates of conformity together with the test result handbook for every delivery we ship; so our clients can be confident too.

BENOR



CSTB



CE



Standard liner

01

Our standard liners are manufactured with a socket and spigot joint, with adequate clearance and tolerance such that one panel connects easily into the next when positioned into the pipeline, sewer or culvert.

For logistical efficiency, Channeline panels are usually manufactured in 2.4 m or 8 ft long solid sections. Shorter lengths can be made if desired.

Optional in-line jointing can be facilitated where it is necessary to provide a liner of maximum external diameter and minimum annular gap, thus eliminating the 10 mm (0.4 in) allowance required for the socket overlap.

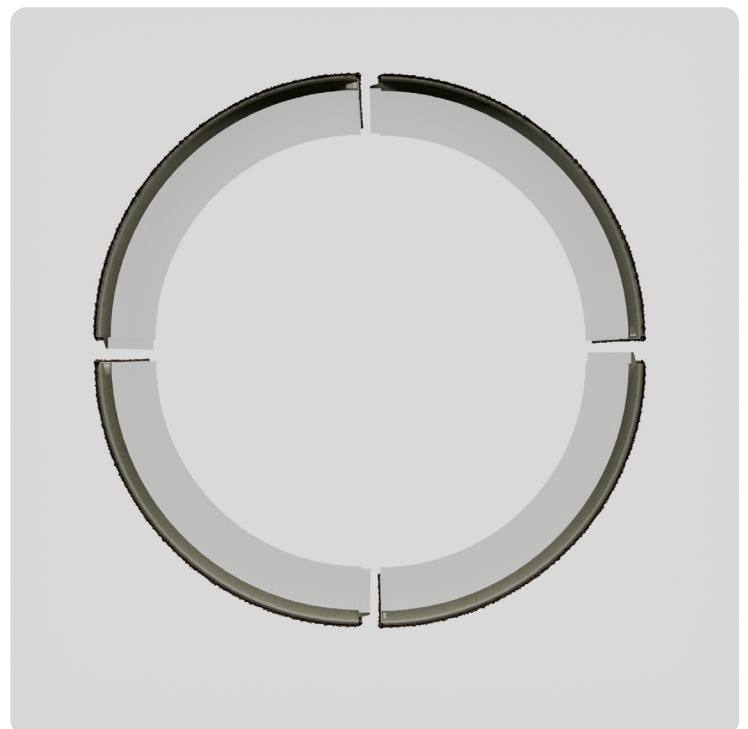


Multi-segmental liner

02

Our multi-segmental liner product uses panels manufactured in two or more longitudinal sections. The panels are then bonded on site, above or below ground, using our patented tapered tongue and groove longitudinal joint and a bell and spigot radial joint, positioned at the points of intersection. Once the segments are assembled using our high-performance resin adhesive, Channelbond, our multi-segmental liner provides the same structural performance as a Channeline liner manufactured as a single piece, with a service life of 150 years.

Our multi-segmental liner is an ideal solution where transportation problems, access difficulties (for example, entry only via manholes), or particularly large structures make it hard to produce and install the product in one panel.



Curved liner

03

Our curved liner offers a truly unique solution for lining bends of any size and shape.

Our socket and spigot jointing method allows for the manual alignment of each sequential panel installation to accommodate small direction changes and offsets quickly and easily. This is perfect for smaller curves, or unintentional direction changes.

Like all Channeline products, our curved liners offer a 150 year service life and can be manufactured using our multi-segmental technology.



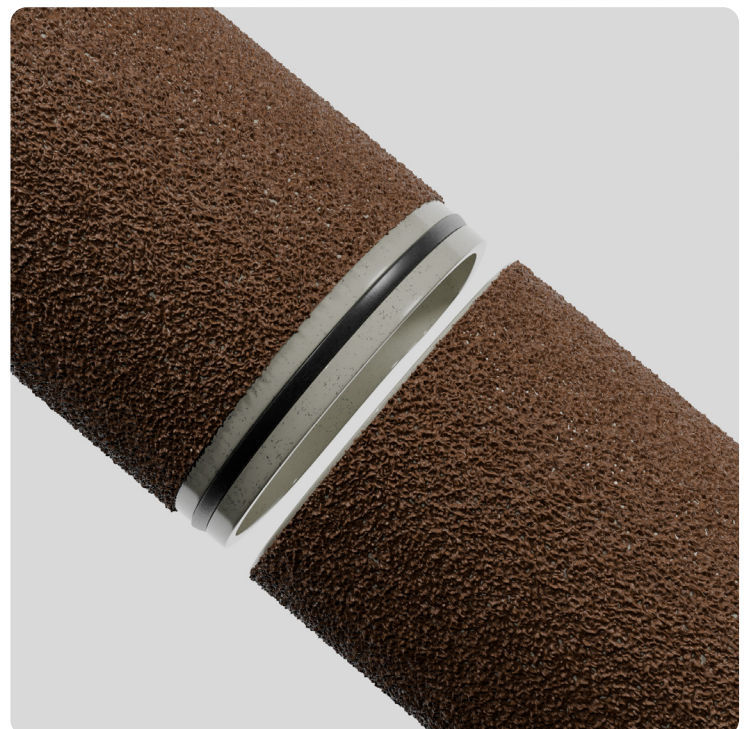
Slip liner

04

Our slip liners allow for slip-line installation (non-man-entry) in live sewer flow conditions, cutting down on installation costs by saving time and eliminating the need for over-pumping.

We use in-line high-strength joints with solid wall gaskets, ensuring easy connection and a reliable pressure-tight seal.

Our optional mounted centralizing skids simplify the correct positioning and jacking of the liner. Straight line lengths of 1,000 m (3,280 ft) and more can be accommodated in a single jacking process.



Crown and invert

05

Our crown and invert products enable the structural rehabilitation of existing buried assets where either a crown or invert is required. The primary benefit of this solution is in providing a cost-efficient alternative to rehabilitating the entire diameter of the host structure, while still achieving Channeline's service life of 150 years.

In circumstances of hydrogen sulfide gas corrosion of the crown, this product provides a fully-structural rehabilitation solution. The design, manufacture and supply of a GRP rail system to support the crown can also be provided.

Our invert product maximizes the hydraulic capacity of the existing asset by up to 25%, as well as offering benefits such as high abrasion resistance, self cleaning and high durability. Channeline's unique design and manufacture methods ensure that the cross-sectional area is maximized.



Manhole

06

Our manhole product is custom designed and manufactured to accommodate any size and shape of manhole possible, creating an exact match for an existing structure. The top transition section can be manufactured in a cone eccentric or concentric shape or any other shape as requested.

This product can also be designed and produced in multiple panel sections for ease of handling, transportation and installation.

Sections are joined together using a bell and spigot joint mechanism, and the joint is bonded with our high-performance resin adhesive, Channelbond. Once installed and grouted in place, the manhole forms a rigid fully-load-bearing structure, with a service life of 150 years.



Transition liner

07

Transitions are needed where there are changes within a pipeline, whether in diameter, shape, angle or slope. Our transition liners are able to facilitate seamless shifts between these features, thanks to our custom design and manufacturing processes.

This seamless shift decreases turbulence within the pipeline, and continues to ensure optimal set up, cross-sectional area, and flow effectiveness.



Lateral connections and fittings

08

Many pipelines and sewers are constructed with incoming lateral connections throughout the length of the structure. The rehabilitation of these is easy and straightforward with Channeline.

Laterals can be connected with mesh and mortar where necessary. For severely degraded lateral connections, repair mortars and GRP inserts can be prefabricated, installed and subsequently bonded to the main sewer liner to provide a smooth, durable solution.

Further, thanks to our custom design and manufacturing processes, Channeline can design and fabricate any desired fittings including:

- ☐ Concentric reducers
- ☐ Eccentric reducers
- ☐ Dished ends
- ☐ Y pieces
- ☐ Reducing tees



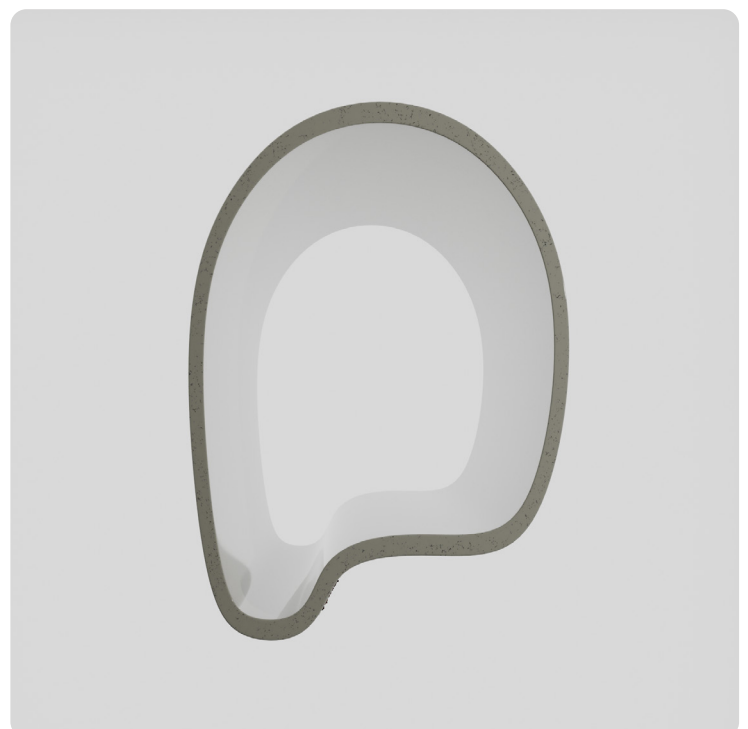
Custom

09

Channeline products are all custom designed and manufactured to meet our client's needs. This means we can produce any of our products at any size and shape, and combine a number of products into one solution. We also offer a number of additional product enhancements, such as:

- Anti-slip grit: Aid safe installation with anti-slip grit on the liner invert.
- Precision grout ports: Strategically placed ports for grouting annular gaps can be added during design and manufacture, removing the need to add these later.
- Mounted centralizing skids: Simplify installation and ensure the correct positioning of liners, as well as ensuring optimal grouting.
- GRP rail mounting system: Ease the installation of crown-only solutions, with a rail installation system.
- Convenient hoisting points: Enhance installation ease with strategically placed hoisting points.
- Ecological enhancements: Safeguard wildlife within and around the system with product enhancements like fish baffles and animal walkways.

No challenge is too great for our team of experts. With our commitment to innovation, and our custom approach, we can accommodate a multitude of requirements and tailor a solution to your unique needs. Simply provide us with the problem, and we'll deliver the perfect solution.



Wastewater

01

Buried, large-diameter pipelines and culverts have represented the backbone of any city's utility network, in some cases for hundreds of years, but many of these are failing due to age. Wastewater systems commonly have very low pH values and a build up of sulfuric acid that gradually corrodes brick, stone, concrete and steel pipes until they finally lose their integrity completely.

Channeline uses glass reinforced plastic - also known as fiber glass or GRP - to produce fully-structural rehabilitation solutions. Known for its low-weight, high-strength qualities, GRP is also highly resistant to corrosion, making it able to easily withstand the low pH values found in wastewater systems. Channeline GRP products have been shown through rigorous testing to offer a service life of 150 years.

The smooth lining of our products has also been shown to increase hydraulic capacity by up to 25%. Additional coatings can also be applied to ensure top performance and durability even in the most challenging conditions, for example industrial applications.



Stormwater

02

Heavy rainfall and impervious surfaces such as roofs and asphalt roads leading rain directly into sewer systems often cause sewers and wastewater treatment plants to reach their full capacity. An effective and reliable network of stormwater drainage infrastructure is needed to combat this challenge.

Channeline products are a fully-structural rehabilitation solution for stormwater drainage systems. Our unique technology means that our solutions are much thinner than standard GRP linings, maximizing the possible cross-sectional area. Plus, the smooth lining of Channeline products has been shown to increase hydraulic capacity by up to 25%, so stormwater drainage remains effective for flooding and other extreme events.



Rail and road culverts

03

Culverts allow water to flow freely under railways and roads. Their design has to consider a number of factors like the weight of the surrounding soil and roads, the soil type of the foundations, and the expected water properties including their flow rates.

Channeline products are custom designed and manufactured, meaning we can take all of these factors into consideration, producing a fully-structural solution that effectively rehabilitates each unique culvert. Critically, installation of our liners can be achieved without any rail or road closures, ensuring those essential transport routes are kept open.



Seawater cooling networks

04

There are many design considerations to take into account within a seawater cooling network, with water pumped from a lake or ocean, then moved through a heat exchanger, before being circulated around pipes to cool buildings.

Usually these systems use steel pipes and replacement is very expensive.

Channeline offers a cost-effective alternative to replacement, instead rehabilitating the existing structure using our fully-structural liners. Thanks to our custom design and manufacturing processes, we can take all of the design considerations into account to produce a fully-structural rehabilitation solution tailor-made to the existing structure.



Tunnels

05

Tunnels are underground passages used for transportation, such as roads, railways, and subways, facilitating efficient travel through mountains, under bodies of water, or congested urban areas. They also serve utilities like water, sewage, and telecommunication lines, enhancing infrastructure connectivity and functionality.

Channeline's capability to manufacture large-diameter, multi-segmental products enables the fully-structural rehabilitation of tunnels of any size.



Custom

06

Channeline excels in crafting bespoke solutions tailored to meet diverse client needs. Leveraging cutting-edge technology and extensive expertise, we meticulously design and manufacture custom products for various applications. Our design team collaborates closely with clients, understanding their specific requirements and challenges to deliver innovative solutions.

With a commitment to quality and precision, Channeline ensures that each custom product is engineered to optimize performance, durability, and cost-effectiveness. From intricate designs to large-scale projects, our flexibility and dedication enables us to consistently deliver superior custom solutions that address unique project demands across industries worldwide.



Get in touch

Want to find out more about Channeline or discuss your unique project requirements? We're here to help.

01

Get in touch with our head office team on our website at channeline.com/contact or email us at info@channeline.com.

02

To find your local Channeline representative, go to channeline.com/local

