

Subline®

Pipe Lining Technique

RADIUS SUBTERRA

Specialist Pipeline Engineering

in radius-subterra.com

What is Subline®?

Subline® is a proven close-fit polyethylene (PE) lining system for the rehabilitation and protection of existing pressure pipelines.

Used across water, wastewater, and industrial networks, Subline® creates a continuous corrosion-resistant liner within the host pipe to seal leaks, improve performance and extend asset life. It is ideally suited to projects where maintaining hydraulic capacity and minimising disruption are key priorities.

During installation, the PE liner is folded into a compact profile to enable insertion using conventional sliplining techniques, before being reverted with water pressure to form a pressure-tight close fit. The result is a trenchless rehabilitation solution that restores pipeline performance without the need for extensive excavation or replacement.



Learn more about Subline® and other Pipe Lining techniques

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Subline® range of applications

PE pipe outside dia.	Wall thickness (mm)							
	SDR 11	SDR 17	SDR 26	SDR 33	SDR 42	SDR 50	SDR 61	SDR 80
75	6.8	4.4	2.9	2.3	1.8	1.5	1.2	0.9
100	9.1	5.9	3.8	3.0	2.4	2.0	1.6	1.3
110	10.0	6.5	4.2	3.3	2.6	2.2	1.8	1.4
125	11.4	7.4	4.8	3.8	3.0	2.5	2.0	1.6
150	13.6	8.8	5.8	4.5	3.6	3.0	2.5	1.9
160	14.5	9.4	6.2	4.8	3.8	3.2	2.6	2.0
180	16.4	10.6	6.9	5.5	4.3	3.6	3.0	2.3
200	18.2	11.8	7.7	6.1	4.8	4.0	3.3	2.5
213	19.4	12.5	8.2	6.5	5.1	4.3	3.5	2.7
225	20.5	13.2	8.7	6.8	5.4	4.5	3.7	2.8
250	22.7	14.7	9.6	7.6	6.0	5.0	4.1	3.1
280	25.5	16.5	10.8	8.5	6.7	5.6	4.6	3.5
300	27.3	17.6	11.5	9.1	7.1	6.0	4.9	3.8
315	28.6	18.5	12.1	9.5	7.5	6.3	5.2	3.9
355	32.3	20.9	13.7	10.8	8.5	7.1	5.8	4.4
400	36.4	23.5	15.4	12.1	9.5	8.0	6.6	5.0
450	40.9	26.5	17.3	13.6	10.7	9.0	7.4	5.6
500	45.5	29.4	19.2	15.2	11.9	10.0	8.2	6.3
560	50.9	32.9	21.5	17.0	13.3	11.2	9.2	7.0
600	54.5	35.3	23.1	18.2	14.3	12.0	9.8	7.5
630	57.3	37.1	24.2	19.1	15.0	12.6	10.3	7.9
710	64.5	41.8	27.3	21.5	16.9	14.2	11.6	8.9
750	68.2	44.1	28.8	22.7	17.9	15.0	12.3	9.4

Suitable for Subline

Wall thickness <3mm
(Practical limit for butt fusion)

Suitability depends on PE resin spec.
(consult Subterra)

Not recommended for Subline
(Wall thickness/SDR limitation)

The projects

Stuttgart, Germany – Trunk Water Main Rehabilitation

Client: Zweckverband Landeswasserversorgung
Pipeline: 1500 mm prestressed concrete trunk main
Length: 538 m

Outcome:
+ Eliminated major leakage losses
+ Extended pipeline life by 50+ years
+ Returned to service in less than two days
+ Demonstrated large-diameter close-fit lining capability

Whitechapel, London – Cast Iron Water Main Rehabilitation

Client: Thames Water
Pipeline: 20″ cast iron water main
Length: 140 m

Outcome:
+ Maintained network capacity
+ Installation completed within a single day
+ Minimal excavation in a densely populated urban location
+ Reduced disruption to local communities and utilities

Eccup Raw Water Main Rehabilitation

Client: Yorkshire Water
Pipeline: 42″ (1050 mm) ferro-concrete raw water main
Length: 827 m

Outcome:
+ Eliminated leakage caused by defective joints and root ingress
+ Completed within the planned possession period
+ Delivered with no disruption to road users
+ Minimised impact on the surrounding environment

Vyrnwy Trunk Main Rehabilitation

Client: United Utilities
Pipeline: 39″ cast iron treated water main
Length: 1.38 km

Outcome:
+ Achieved lining sections of up to 715 m
+ Eliminated internal corrosion and joint leakage
+ Maximised pipeline flow capacity
+ Reduced environmental impact and excavation requirements

Woodford & Finsbury Park Trunk Mains Rehabilitation

Client: Thames Water Utilities
Pipeline: 42″ and 36″ cast iron trunk water mains
Length: 424 m

Outcome:
+ Rehabilitated complex trunk mains beneath a major development site
+ Avoided disruption to adjacent utilities and ongoing construction works
+ Delivered using a minimal site footprint

The facts

As pipeline infrastructure continues to age, operators need cost-effective rehabilitation solutions that protect assets and reduce operational disruption. Subline® provides a proven answer.

- Proven close-fit PE rehabilitation technology used internationally for decades.
- Available for pipe diameters from **75 mm to 1600 mm**.
- Suitable for water, wastewater, and industrial applications.
- Folding reduces the liner cross-sectional area by around **40%**, improving insertion efficiency.
- Installation lengths exceeding **1000 m** are achievable.
- Can negotiate bends up to **45°** depending on diameter and site conditions.
- Installed and reverted using water pressure at ambient temperature.
- Spans corrosion holes and joint gaps.
- Stops internal corrosion and provides a **50+** year design life.
- Utilises existing pipeline infrastructure as a conduit, reducing environmental impact compared with replacement.

Features and benefits

Subline® combines proven polyethylene lining technology with a trenchless installation process to deliver long-term rehabilitation performance.

By retaining hydraulic capacity, preventing further deterioration and minimising disruption during installation, Subline® provides a cost-effective alternative to pipeline replacement across water, wastewater, and industrial networks.

Close-Fit PE Liner Design

+ Maximises retained hydraulic capacity.
+ Maintains pipeline bore more effectively than conventional sliplining.
+ Forms a continuous liner within the host pipe.

Site-Folded Liner Technology

+ Reduces liner cross-sectional area by approximately 40% during installation.
+ Enables easier insertion through existing pipelines.
+ Minimises installation friction and winching loads.

Long-Length Installation Capability

+ Installation lengths exceeding 1,000 m are achievable.
+ Reduces the number of excavation locations required.
+ Suitable for large-scale transmission pipeline rehabilitation.

Bend Negotiation Capability

+ Can typically negotiate bends up to 45°.
+ Reduces the need for additional excavations.
+ Provides greater flexibility in constrained environments.

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Thin-Wall Polyethylene Construction

- Maximises free bore of the rehabilitated pipeline.
- Reduces liner material requirements.
- Delivers a cost-effective rehabilitation solution.

Corrosion-Resistant Barrier

- Prevents further internal corrosion.
- Protects asset condition over the long term.
- Helps maintain water quality by isolating corrosion products and deposits.

Hole and Gap Spanning Capability

- Seals leakage from failed joints and corrosion holes.
- Bridges circumferential gaps and defects.
- Supported by validated design methodologies.

Smooth Internal Pipe Bore

- Reduces friction losses.
- Improves hydraulic performance.
- Can increase flow capacity in heavily tuberculated or corroded mains.

Ambient Temperature Reversion Process

- No heating required during installation or reversion.
- Simplifies site operations.
- Reduces equipment requirements and operational complexity.

Trenchless Rehabilitation Process

- Minimises excavation and surface disruption.
- Reduces impact on communities, traffic and adjacent utilities.
- Provides environmental and sustainability benefits over replacement.

Standard PE Materials

- Uses proven pipe-grade PE80 and PE100 materials.
- Available with approvals for potable water applications.
- Materials are widely understood and supported across the utility sector.

Proven Long-Term Asset Protection

- Validated design life in excess of 50 years.
- Extends the operational life of existing pipeline assets.
- Helps reduce long-term maintenance and replacement requirements.

FAQs

When should Subline® be used?

+ Subline® is typically used where the host pipeline remains generally structurally sound but is affected by internal corrosion, leakage, failed joints, water quality issues or reduced hydraulic performance. It is particularly suitable where replacement would be disruptive, costly, or environmentally sensitive.

What applications is Subline® best suited for?

+ Water, wastewater, and industrial pipeline rehabilitation projects where maintaining capacity and minimising disruption are important.

What condition does the host pipeline need to be in?

+ Subline® is primarily intended for pipelines that remain generally structurally sound and capable of providing long-term support to the liner. The condition of the host pipeline should be assessed as part of the design process.

How is the Subline® liner installed?

+ The PE liner is welded into long lengths, folded into a compact profile, inserted using sliplining techniques, and then reverted into a close-fit liner using water pressure.

What defects can Subline® address?

+ Subline® can seal leaking joints, span corrosion holes and circumferential gaps, prevent further internal corrosion and help address water quality issues caused by deposits and tuberculation. Detailed suitability should always be assessed during the design stage.

Does Subline® maintain flow capacity?

+ Yes. The close-fit design and smooth polyethylene bore minimise friction losses and maximise the available bore. In many cases, hydraulic performance can be improved compared with heavily tuberculated or corroded host pipes.

What pipe materials and sizes can be rehabilitated?

+ Subline® can be used to rehabilitate steel, ductile iron, cast iron, asbestos cement and concrete pipelines. It is available for pipe diameters from 75 mm to 1600 mm, depending on the application and liner configuration.

What installation lengths are possible?

+ Installation lengths exceeding 1000 m are achievable, subject to pipe diameter, host pipe condition and site constraints.

Can the liner negotiate bends?

+ Yes. Subline® liners can typically negotiate bends up to 45°, depending on pipeline geometry, diameter and site conditions.

Is the liner approved for potable water applications?

+ Yes. Subline® uses standard PE pipe materials that can be supplied with approvals for potable water contact. The forming process only contacts the external surface of the pipe, allowing existing material approvals to be maintained.

How long is the design life?

+ Subline® is supported by validated design methodologies and typically provides a design life more than 50 years when correctly designed and installed.

How disruptive is installation?

+ Minimal. Only limited excavations are typically required, and the process has a significantly smaller environmental footprint than traditional pipe replacement, helping minimise disruption to communities, traffic, and surrounding infrastructure.

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Accreditations, Innovation & Sustainability

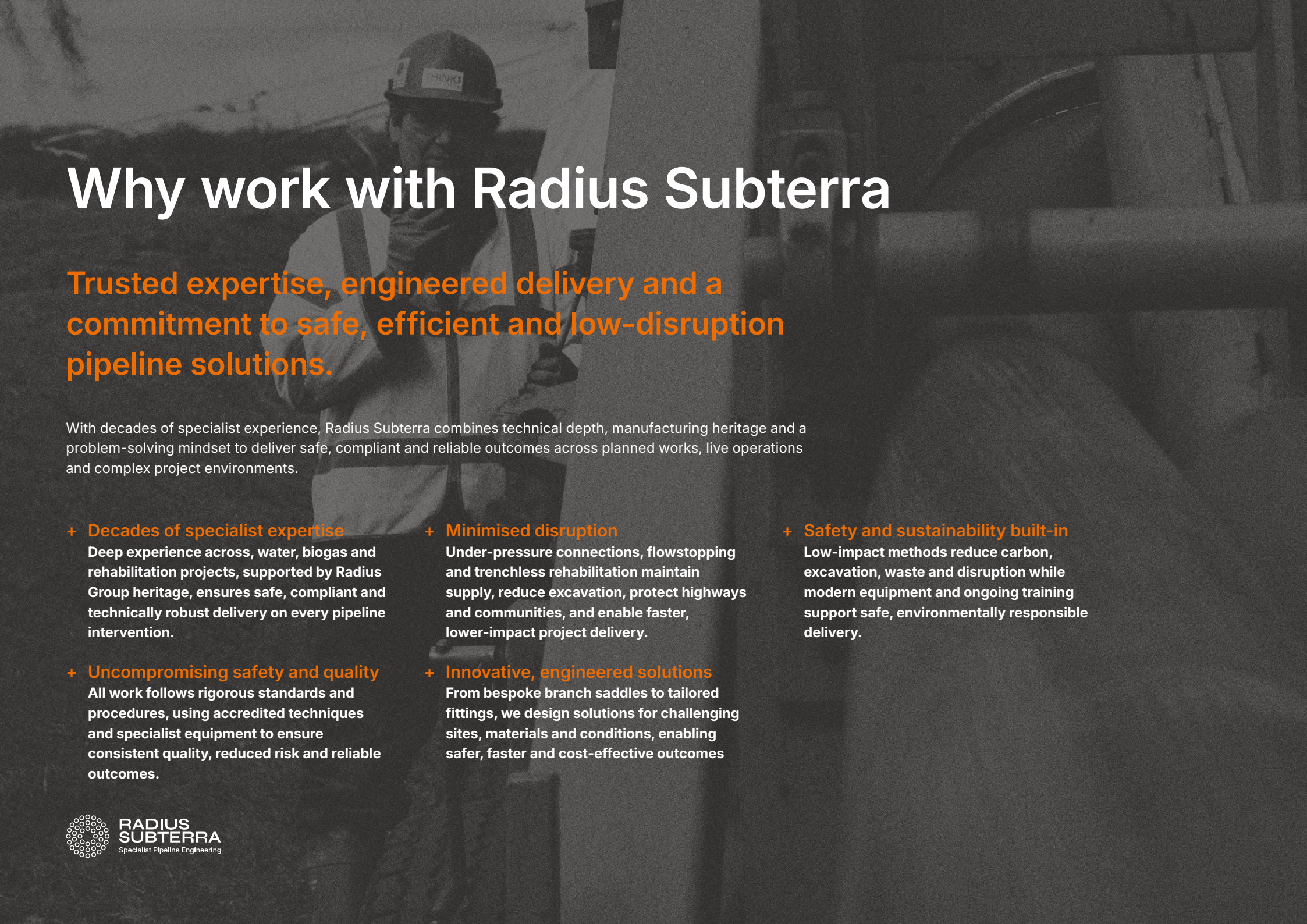
Driven by quality, shaped by innovation, committed to safe and sustainable delivery.

Radius Subterra operates within a rigorous quality, health, safety and environmental framework, supported by extensive industry accreditations and group-wide governance.

We maintain certification to ISO 9001, ISO 14001 and ISO 45001, alongside sector-specific accreditations such as Constructionline, Achilles, SafeContractor, GIRS, IGEM and EUSR, providing assurance of safe, compliant and technically robust delivery.

Our innovation culture is underpinned by access to advanced PE products, specialist technologies and in-house testing capability across the wider Radius Group.

Sustainability is central to how we work, with methods that reduce excavation, minimise waste, lower carbon output and support responsible construction practices throughout the pipeline lifecycle.



Why work with Radius Subterra

Trusted expertise, engineered delivery and a commitment to safe, efficient and low-disruption pipeline solutions.

With decades of specialist experience, Radius Subterra combines technical depth, manufacturing heritage and a problem-solving mindset to deliver safe, compliant and reliable outcomes across planned works, live operations and complex project environments.

+ Decades of specialist expertise

Deep experience across, water, biogas and rehabilitation projects, supported by Radius Group heritage, ensures safe, compliant and technically robust delivery on every pipeline intervention.

+ Uncompromising safety and quality

All work follows rigorous standards and procedures, using accredited techniques and specialist equipment to ensure consistent quality, reduced risk and reliable outcomes.

+ Minimised disruption

Under-pressure connections, flowstopping and trenchless rehabilitation maintain supply, reduce excavation, protect highways and communities, and enable faster, lower-impact project delivery.

+ Innovative, engineered solutions

From bespoke branch saddles to tailored fittings, we design solutions for challenging sites, materials and conditions, enabling safer, faster and cost-effective outcomes

+ Safety and sustainability built-in

Low-impact methods reduce carbon, excavation, waste and disruption while modern equipment and ongoing training support safe, environmentally responsible delivery.

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Who we work with

Trusted by operators, developers and contractors across essential infrastructure sectors.

Radius Subterra supports a broad range of organisations responsible for delivering, maintaining and upgrading vital pipeline infrastructure. We work with utility providers, energy networks, industrial operators, contractors and developers, delivering safe, efficient and technically assured services across planned works, complex interventions and live operational environments.

With capabilities spanning, water, biogas and rehabilitation, as well as specialist support across wider infrastructure sectors, we provide dependable engineering solutions tailored to diverse asset, regulatory and project demands.



- Water
- Biogas
- Pipeline Rehab

Other sectors we support

Beyond our core utility and energy work, Radius Subterra also supports a range of specialist infrastructure sectors that require safe, precise and technically assured pipeline engineering.

- Fire protection
- Geothermal
- Waste Water
- Nuclear
- Hydroelectric
- Oil & Petrol



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