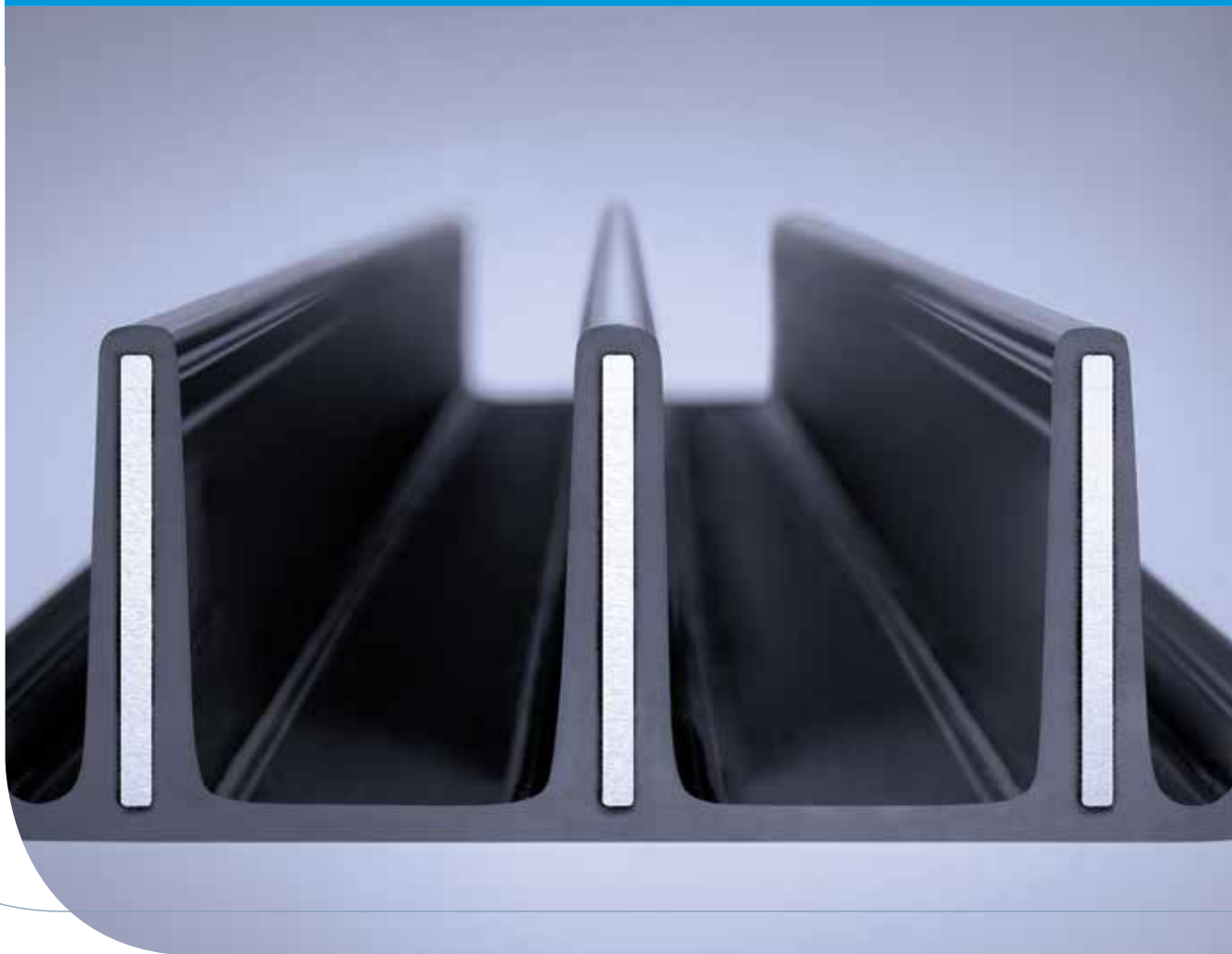


SPR™ PE

STRUCTURAL, REINFORCED HDPE LINER FOR GRAVITY PIPELINES
FROM 900 mm TO 3000 mm



FORMING GLOBAL CONNECTIONS

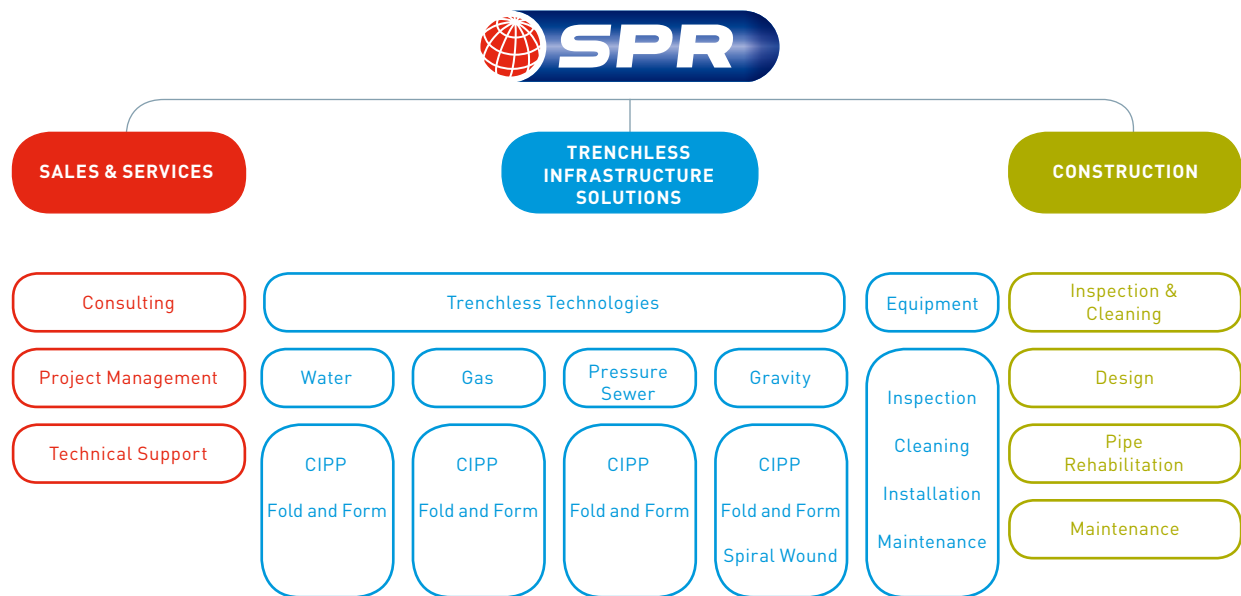


SEKISUI SPR'S TECHNOLOGIES AND SERVICES

SEKISUI SPR Group is synonymous with superior solutions for underground infrastructure worldwide.

SEKISUI SPR offers outstanding and environmentally sustainable technologies and construction services

for water supply and drainage through its global sales network.



SEKISUI SPR's innovative, patented, and world renowned spiral wound technologies are used the world over for the time and cost efficient means they offer for rehabilitating damaged pipes with minimum impact on the environment.

The spiral wound technologies for gravity are based on the principle of winding a continuous plastic strip into a liner directly into the deteriorated pipe. The plastic strip is spirally wound via a patented winding machine positioned in the base of an existing manhole or

access chamber. The edges of the strip interlock as it is spirally wound to form a continuous watertight liner inside the host pipe.

For the spiral wound rehabilitation of gravity pipes SEKISUI SPR offers five technology systems:

	SPR™	SPR™ PE	SPR™ EX	SPR™ ST	SPR™ RO
Diameter	800 – 5500 mm 32 – 217 in.	900 – 3000 mm 36 – 120 in.	150 – 1050 mm 6 – 42 in.	450 – 2500 mm 18 – 99 in.	800 – 1800 mm 32 – 72 in.
Material	PVC	HDPE	PVC	PVC	PVC
Shape	circular, non-circular, custom shape	circular	circular	circular	circular
Installation	fixed diameter	fixed diameter	close fit	fixed diameter	close fit



STRUCTURAL, REINFORCED HDPE LINER FOR GRAVITY PIPELINES

The SPR™ PE pipe rehabilitation process is a solution for restoring the hydraulic efficiency, reliability and integrity of aging sewers, storm drains and culverts.

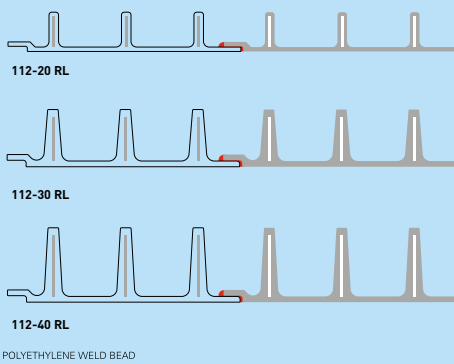
The fully encapsulated steel reinforcement is designed to provide a liner of optimum stiffness for the application.

The plastic profile that forms the liner is provided in a range of sizes. The profile is reinforced with steel that is completely encapsulated within the HDPE material. The steel reinforcement is selected to provide a liner with sufficient stiffness to meet the design requirements of the project.

Project experience

SPR™ PE has been used to rehabilitate sewers, stormwater lines and culverts around the world. It has been proven capable of providing a structural liner for severely deteriorated pipelines, and has been installed under difficult site conditions with minimal community disruption.

HDPE Profiles and Sealant Materials



Cross-section of a typical profile, showing the weld that joins together successive wraps of steel reinforced HDPE profile.

SPR™ PE liners can structurally rehabilitate brick, concrete, glass reinforced plastic or corrugated metal sanitary sewer and stormwater pipelines with diameters from 900 mm to 3000 mm.

Easy mechanical installation

The deteriorated pipeline is first cleared of debris and obstructions, cleaned and inspected, the diameter measured and then proved. The winding machine is lowered to the base of the access chamber through standard manhole openings. The reinforced HDPE profile is fed into the machine from an above ground spool.

The winding machine then winds the reinforced HDPE profile to form a new

pipe. The process continues until the liner wound by the SPR™ PE winding machine reaches the end of the pipeline length to be rehabilitated. The ends of the liner at both access chambers are sealed and rendered to make them smooth with the host pipe.

The annulus between the fixed diameter liner and the host pipe can be filled with cementitious grout immediately after the winding is completed.

FULLY ENCAPSULATED STEEL

Flow advantages

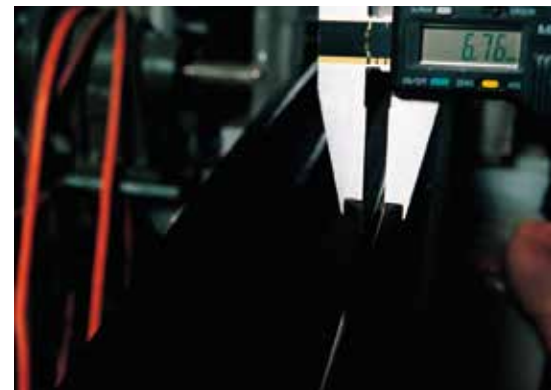
- Hydraulically efficient, smooth bore with circular cross section
- Usually greater hydraulic capacity than the host pipe
- No ripples or wrinkles even when host pipe joints are offset

A strong flexible liner

- Can be designed as a structural liner, a range of HDPE and steel combinations are available to meet design requirements
- Structurally efficient circular cross section – even when the host pipe is misaligned
- Constant wall thickness even when negotiating voids in the host pipe
- Factory manufactured and machine installed, liner installation does not depend on the standard of workmanship in difficult conditions

Fast installation with minimum community disruption

- Rapid set up, safe work sites and low noise during construction
- No need to excavate launch pits or store pipes on-site
- Small support vehicles – less disruption of traffic
- Can operate with some flow in the existing pipe, up to 25 % subject to velocity and safety considerations
- Installation possible from difficult to reach access chambers – support vehicles and equipment can be placed remotely



Quality control during the profile extrusion process



Products tested in accordance with global standards

The benefits of SPR™ PE at a glance

- Structural liner, strong and lightweight
- Manufactured from pipe grade high density polyethylene (HDPE) with embedded steel reinforcing
- Steel thickness can be varied to vary pipeline stiffness
- Diameters from 900 mm to 3000 mm using three profiles
- Suitable for gravity flow sanitary sewer and stormwater pipelines
- WRc Approved™ (PT/295/0110)

Proven pipe material

- Made from similar grade of HDPE as new sewer and drainage pipe
- Cell Classification of 335420C (or E) in accordance with ASTM D 3350
- Profile sealing is achieved by extrusion welding to produce a continuous jointless HDPE liner
- Consistent material properties. The pipe strength does not rely upon the grout for its strength, only to transfer the load to the liner

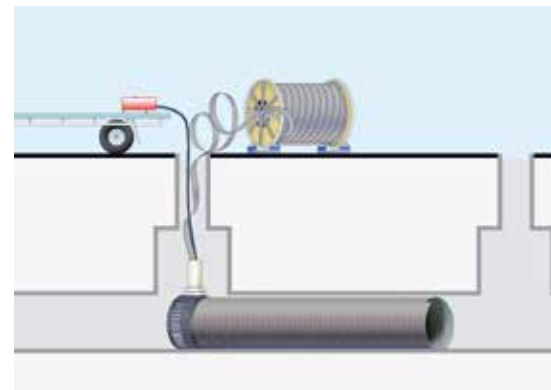
Design

Numerous industry specifications provide design methods applicable to SPR™ PE, including:

- ASTM F 1741: "Standard Practice for Installation of Machine Spiral Wound PVC Liner Pipe for Rehabilitation of Existing Sewers and Conduit" modified for SPR™ PE (HDPE) liner pipe
- Australian Water Authority Specifications, usually based on Australian Standard AS 2566.1: "Buried Flexible Pipelines, Part 1: Structural Design"

Section Properties of Typical SPR™ PE Profiles

PROFILE	NOMINAL HEIGHT	TYPICAL PIPE DIAMETER	
112 - 20RL	20	900 - 1100	mm
112 - 30RL	30	1100 - 1650	mm
112 - 40RL	40	1650 - 3000	mm



On-site setup for SPR™ PE installation



SPR™ PE liner being produced by the winding machine

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