Hyliner AKS HDPE Lining

Technical Guide D1.12

HyLiner AKS HDPE is used as corrosion protection lining in precast and cast in-situ concrete elements or structures to increase durability and reduce the risk of abrasion.

Applications

- Corrosion protection lining for precast concrete pipes in sewer pipelines
- Corrosion protection lining for in-situ concrete structures in wastewater treatment plants
- Abrasion protection lining in high abrasion environments
- Broad range of application in both precast and cast in-situ concrete

Product Attributes

- Available in white (sewer applications) and black (where high UV resistance is required)
- 12 mm long anchors are integrally formed with the sheet
- Factory QA tested and welding of joints is 100% quality tested onsite

Quality

- ISO 9001:2008 Quality Management Standard

We are the supply partner of choice for New Zealand's civil construction industry, specialising in water and infrastructure based solutions.

HYNDS PIPE SYSTEMS

HyLiner AKS HDPE is used as corrosion protection lining in precast and cast in-situ concrete elements or structures to increase durability and reduce the risk of abrasion.

Lining systems are able to bridge discontinuities in pipe or structure walls unlike other coating systems that rely on the integrity of the surface and quality of the surface preparation and the installer's expertise for functionality.

HyLiner AKS HDPE is a thermoplastic lining used to reduce the risk of sulphide attack or corrosion in sewage applications.

The high density polyethylene *(HDPE)* lining suits both precast and in-situ applications. Firmly anchored to the concrete surface of the pipe or structure, the lining requires only welding of joints to form a durable, chemically resistant concrete protection membrane with high abrasion resistance.

Installation

Installation procedures vary depending on the product:

Spun concrete pipe

The liner is inserted into the pipe prior to the completion of manufacture, with the pipe spinning process completed with the liner installed. This ensures that all the anchor knobs are well embedded in the spun concrete prior to the concrete curing and hardening.

Wet cast concrete pipe

The liner is securely attached to the inner mould before placement of reinforcement and casting of the pipe. The pipe once cast is cured in the normal manner using heat to accelerate the hardening process.

Precast concrete

This follows a similar process to the wet cast concrete pipe whereby the liner is attached to the mould prior to casting of the element.

In-situ concrete

This follows the same process as for precast concrete whereby the liner is attached to the formwork prior to casting of the concrete.

Installation Detail

In the case of concrete pipes, the liner need only be applied to the pipe's internal surface above low flow level during normal operating conditions as shown in fig 3.

Where 360° cover is required, the liner is fitted with an overlap at the invert (50 mm min) as shown in fig 4 & 5. This joint is not usually welded as it allows any accumulation of moisture from external hydrostatic pressure to dissipate from behind the liner.

Where the fluid contents are themselves aggresive, such as trade waste discharges, a longitudinal weld can be provided to seal the pipe invert.

FIG. 1 Where 360° cover is required, the liner is fitted with an overlap at the invert (50 mm min)

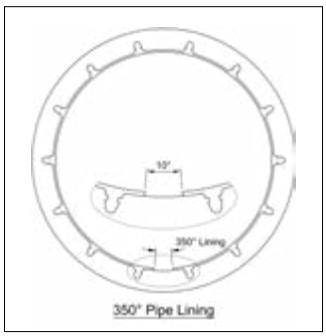

FIG. 3 Most concrete pipes only require the liner applied to the pipe's internal surface above low flow level during normal operating conditions.

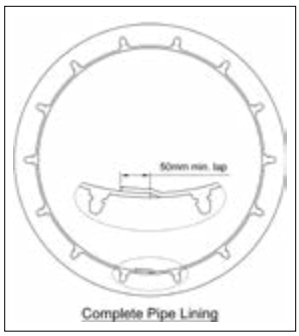

FIG. 2 Invert overlap in a 1050Ø pipe.

Jointing

A continuous lining system is created through the use of extrusion welding carried out by trained, qualified operators. Generally overlapped welds are recommended.

Various details for welded joints for precast concrete pipes and components are shown in Figures 4 to 6. Other details for site installation and fixing of brackets are shown in Figures 7 to 12.

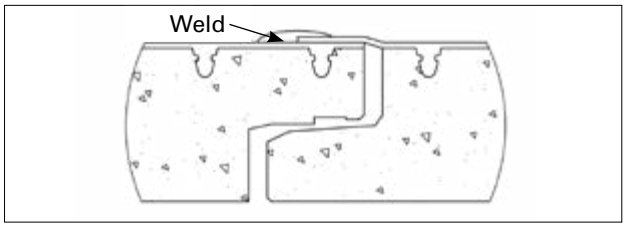

FIG. 4 HyLiner lined SRJ pipe (Lapped Joint)

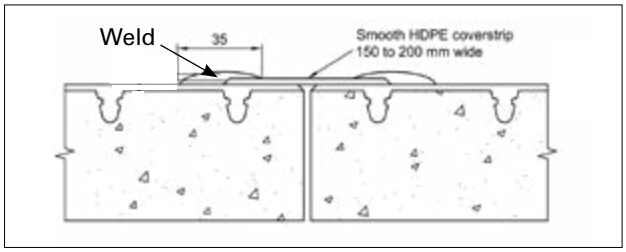

FIG. 5 Cover strip with 2 overlap welds

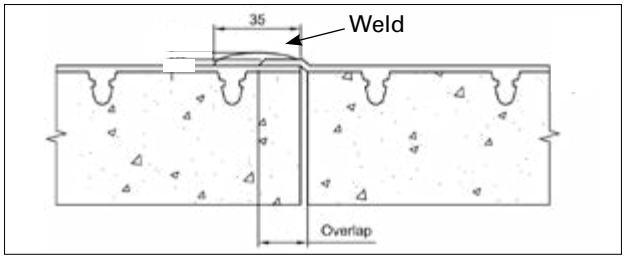

FIG. 6 Single overlap weld

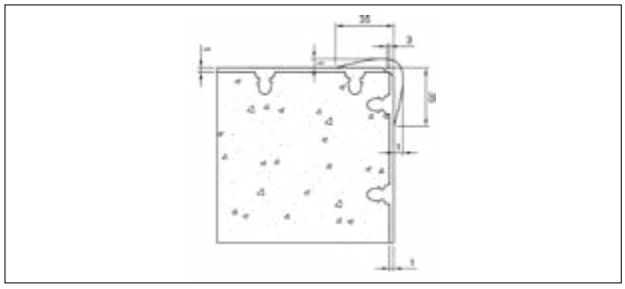

FIG. 7 Outside Corner Weld

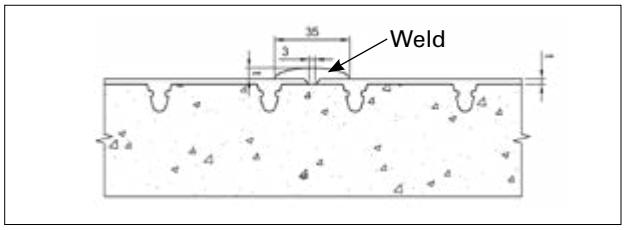

FIG. 8 Flat Extrusion Butt Weld

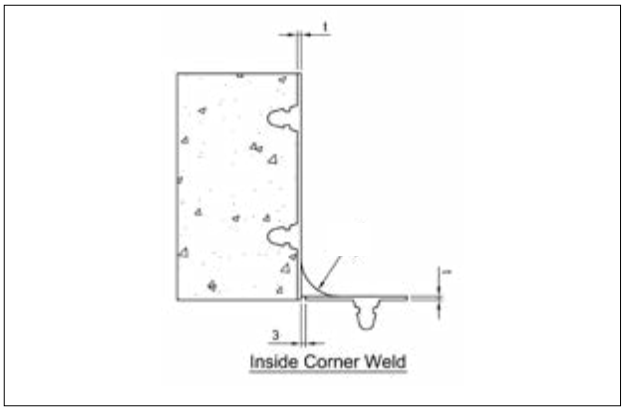

FIG. 9 Inside Corner Weld

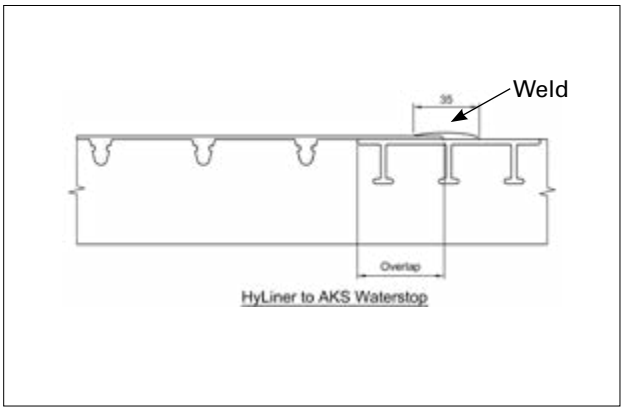

FIG. 10 HyLiner to AKS Waterstop

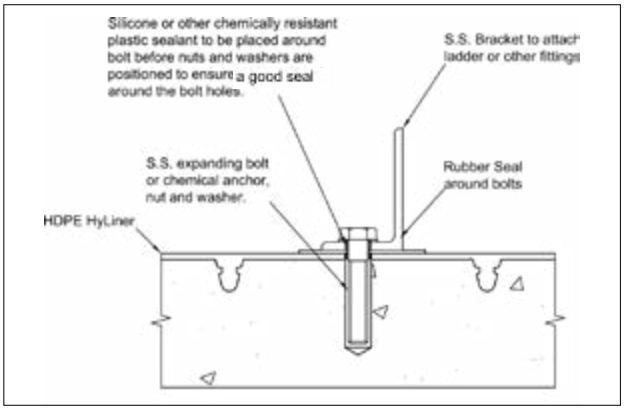

FIG. 11 Sealing of Brackets and Fittings to HyLiner Lined Structures

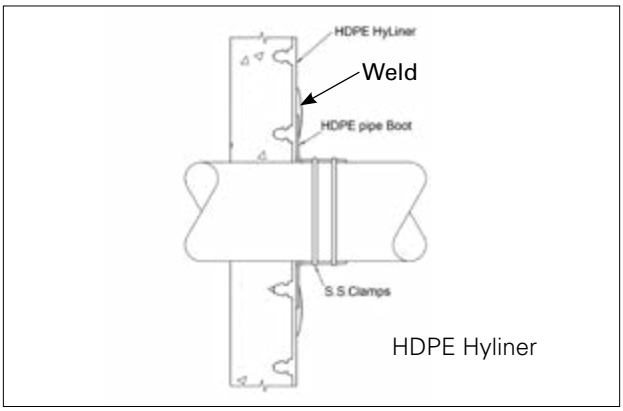

FIG. 12 Pipe Penetration Detail

Quality Control

In-plant quality control for the manufacture of the liner includes waviness, surface finish, knob shape and alignment, crimp height and depth of knobs, sheet thickness, density and tensile values.

Quality checks after casting into precast concrete pipes and components include effective anchor embedment, liner positioning on the product and spark testing for pin holes or damage.

All joints and the liner are spark tested after jointing is completed on site. This ensures the quality of the joints and identifies any damage in the liner as a result of handling and installation.

Abrasion resistance

HyLiner AKS HDPE has a good abrasion resistance when compared to other materials. A typical abrasion test value for HDPE liners is 0.3mm after 400 000 cycles *(Kirschmer, O., "Problems of Abrasion in Pipes", Steinzeugin Formationen, 1966, No 1, pp3-13)*.

Wear rates are very slow even under continuous flow of abrasive slurry. Most drainage applications would have intermittent exposure to abrasion.

Suitable Structures for Lining

HyLiner AKS HDPE is suitable for installation in spun and wet cast concrete pipes from 1050–3000 mm diameter.

HyLiner AKS HDPE is also suitable for lining a range of other concrete structures:

- Manhole risers and lids
- Rectangular or square precast concrete chambers and lids
- Precast concrete channels and lids
- Precast concrete pumpstations
- Insitu concrete structures such as tanks and chambers

FIG. 13 2300 Diameter Manhole Riser

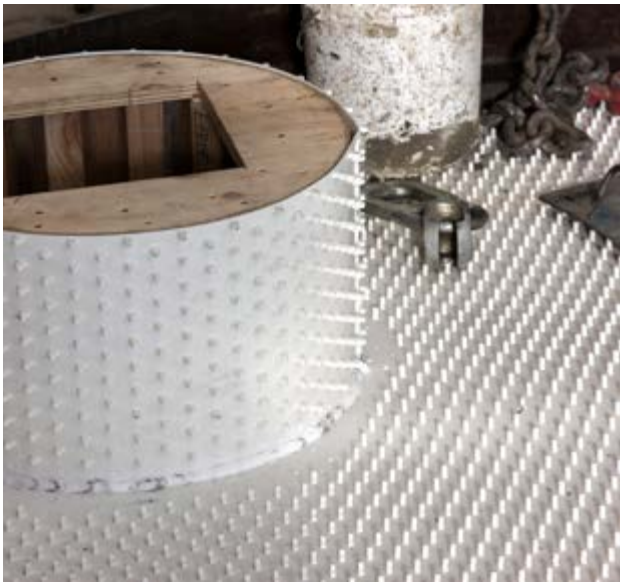

FIG. 14 Liner being installed for a manhole lid

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