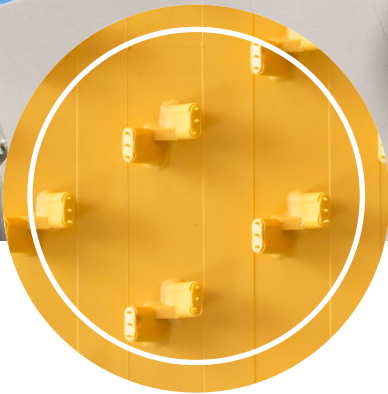


Concrete Protection

The Sure-Grip® concrete protective liner system, developed and patented by Agru, is a high-quality innovative solution for the long-term protection of concrete structures. It meets and/or exceeds the highest requirements for a chemical-proof construction.



For more information about Agru America
and our products, visit agruamerica.com



AGRU is a family-owned company with worldwide production and distribution of high-quality thermoplastic products. One of our core technologies is concrete protective liners made of PE, PP, PVDF and ECTFE.

Our *Concrete Protection* product group offers a complete, top-quality range of concrete protective liners that have a special focus on protecting concrete structures from aggressive and abrasive media. These liners are used wherever there are increased requirements towards a concrete structure and are particularly popular when corrosive fluids or gases need to be transported or stored.

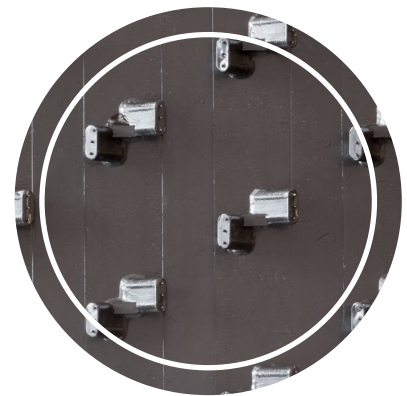
Sure-Grip® System

Sure-Grip® concrete protective liners made of HDPE, HDPE-el, PP, PVDF and ECTFE are produced with state-of-the-art manufacturing technology. This system has been successfully applied worldwide for more than 25 years.

A System with Benefits

Concrete protective liners prevent concrete corrosion and degradation and can substantially extend the lifetime of a structure. In addition, by preventing exfiltration and infiltration, they provide direct protection for the environment and increased operating efficiencies.

Furthermore, the unique anchoring system also enables construction in areas of significant backpressure.





Concrete Protective Liner Advantages

Concrete protective liners combine the advantages of thermoplastics (flexible, ductile, corrosion resistance) with those of concrete (high strength, high stiffness). Thus, the concrete is protected effectively and the durability is increased.

- Applicable for a wide variety of concrete structures
- Secure mechanical anchoring to the concrete structure
- High elasticity to bridge cracks in the concrete
- High impact resistance
- Excellent shear resistance
- Suitable for aggressive media (corrosion resistant)
- Applicable within a wide temperature range
- Long life expectancy
- Low maintenance and easily cleanable
- Easy and safe installation
- Available in UV resistant materials



Innovative and Unique Design

The unique V-shaped anchor studs, which are integrally formed onto the liner during the extrusion process, allow a secure mechanical anchoring of the concrete protective liner to the concrete.

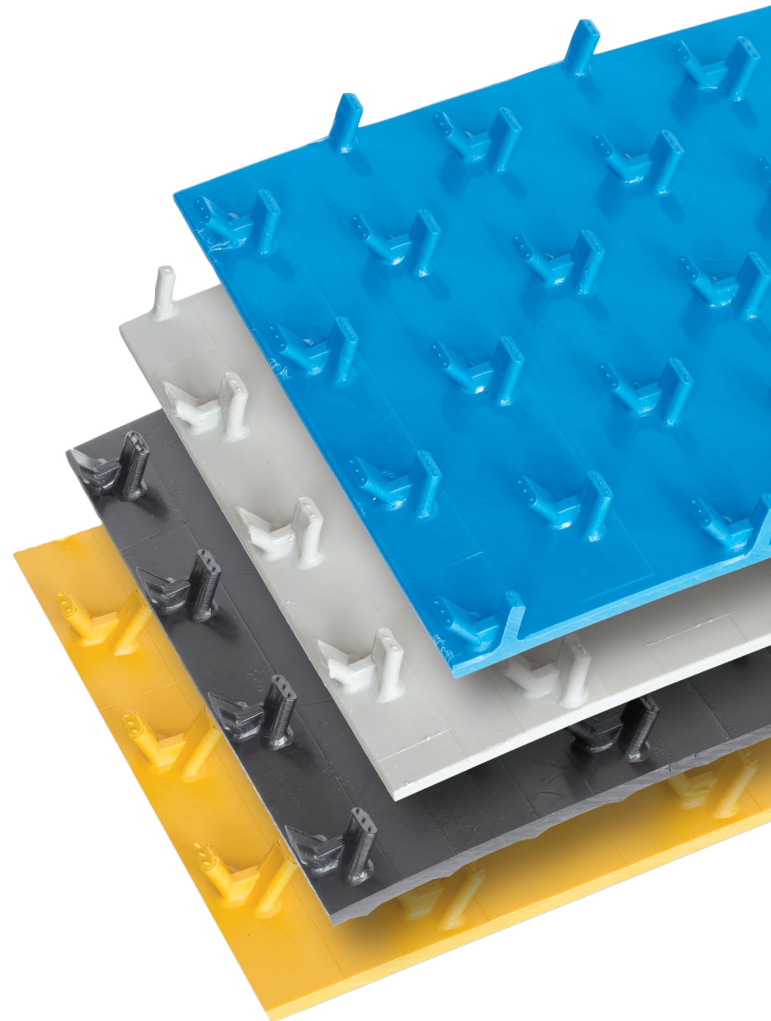
This design guarantees optimum anchoring to the concrete, even though plastic and concrete have different thermal expansion coefficients.

Depending on the specific project requirements, a variety of anchor designs, resins, and liner thicknesses are available.

Leak-Proof Construction

Concrete protective liners are joined by welding, which provides permanent and reliable joints. Different welding technologies, depending on the project requirements, are available for a secure and leak-proof joint:

- Heating element butt welding
- Extrusion welding
- Hot wedge welding





Lining of Precast Concrete Structures

The Sure-Grip® system, as well as the Ultra Grip® system, enable a wide range of applications for the lining of precast concrete structures.

The systems, especially developed by AGRU for concrete pipes, provide efficiency in the following installations:

- Prefabricated concrete elements
- Concrete pipes and manholes
- Tank construction
- Oil/water separators

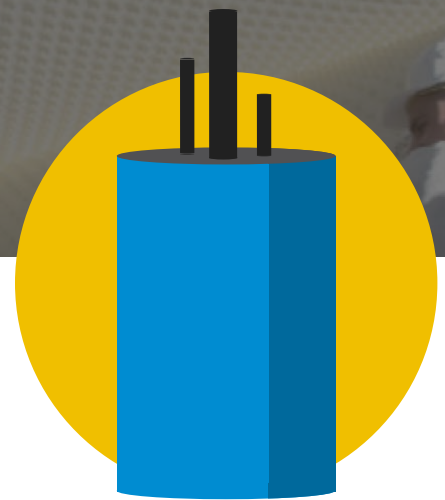
Lining of Cast in Situ Structures

The concrete protective liners are easily fabricated to the shape of the construction on-site. They are mounted to the formwork quickly and safely by means of end profiles and tear off profiles. After the concrete sets, the concrete protective liner system is extrusion welded to provide a leak-proof solution.

This installation method has the benefit of erecting the concrete protective liners and the formwork at the same time.

Applications:

- Underground construction
- Foundations and bridges
- Areas where chemical media are used, transported or stored
- Any type of basin





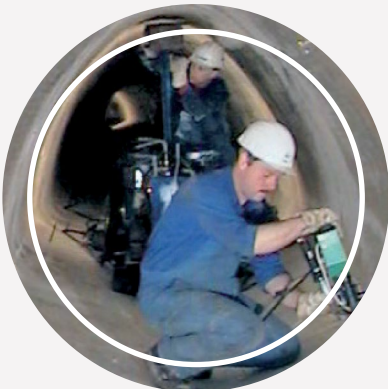
Relining Concrete Structures

In addition to the lining of new structures, concrete protective liners can also be used for relining. This is a very cost effective way of renovating concrete tanks as the existing concrete structure remains and the concrete protective liners are applied ex post.

Trenchless Relining of Underground Pipes

Agru offers system solutions for trenchless relining which enable the rehabilitation of various cross sections and dimensions, independent of the degree of corrosion:

- Segment relining
- Hose relining



Segment Relining

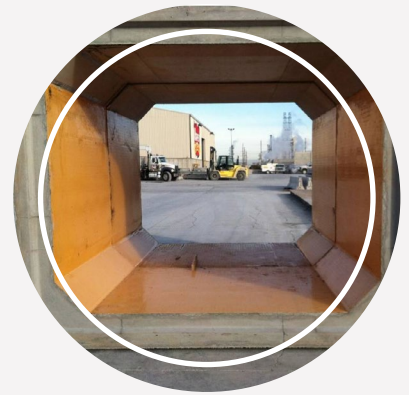
Short prefabricated inliner sections are inserted into the channel. These sections are then fixed to the formwork. The gap between the liner and the old pipe is finally backfilled with highly flowable injectable grout. After the grout sets, the formwork is removed and the individual segments are welded together.

Starting with diameters of 32" this relining method is very advantageous when used for larger dimensions.



Tank Relining

Most tank sections can be prefabricated as well as preassembled. This significantly speeds up the on-site installation efforts, reduces production downtime and saves money.



Pipe Relining

The liners, custom fabricated for each and every project, are pulled from manhole to manhole. The liner is sealed with plugs, and water pressure is introduced depending on the grouting length. Next, a special grout is injected into the gap between the liner and the old pipe.

This system has been used successfully for many years.

With hose relining, section lengths up to 650' are possible, and rehabilitated diameters range from 12" up to 84".





Sure-Grip®

The Well-Established Standard

The concrete protective liner standard type, with a stud height of 13 mm, is used for new construction, tank rehabilitation and precast elements such as concrete pipes and manholes.

For Advanced Requirements

The advanced type with a stud height of 19 mm is used as concrete protection for new structures and repairs with special requirements.

Supply Range (13mm Stud Height)

Material	Thickness	
	From (mm)	To (mm)
PP Grey	3.0	8.0
PP Black	3.5	5.0
PE Black	2.0	12.0
PE Yellow	2.0	5.0
PE Agate Gray	2.0	5.0
PE-el Black	3.0	5.0
PVDF Natural	3.0	4.0
ECTFE Natural	2.5	2.5

Supply Range (19mm Stud Height)

Material	Thickness	
	From (mm)	To (mm)
PE Black	2.0	3.0





Agru Ultra Grip®

For High Backpressures

The innovative stud design of Agru Ultra Grip® has an enhanced shape which offers a superior resistance to backpressures or being pulled out of the concrete. Agru Ultra Grip® is recommended for installations of structures in areas of high groundwater where backpressures will be encountered.

Furthermore, Agru Ultra Grip® concrete protective liner is available in 16.4' widths (10' in US). Consequently, it is the best solution for larger constructions. The increased stud width reduces the number of welds up to 60% which makes the installation faster and more cost-effective.

Supply Range (13mm Stud Height)

Material	Thickness	
	From (mm)	To (mm)
PP Black	2.0	5.0
PE Black/White	2.0	5.0
PE Yellow	2.0	5.0

Self-Cleaning System

This surface pattern was developed based on the latest scientific research on self-cleaning surfaces with bionic behavior. The bionic surface reduces sedimentation in the bottom area of sewers, which is especially beneficial at discontinuous flow.

Even at low flow rates a positive self-cleaning effect can be observed. Turbulence created by the specially shaped ribs results in solids being transferred to the liner's central bottom section and being carried away.

The resulting reduction of sediments minimizes the generation of microbial-induced corrosion which is the primary cause of concrete corrosion in sewers. Furthermore, it results in an overall reduction in maintenance costs for sewer systems.

Supply Range

Material	Thickness	
	From (mm)	To (mm)
PE Yellow	2.0	3.0



Sure-Grip® Special Types

Sure-Grip® with Signal Layer

Light-colored signal layer for visual detection of damages; improved installation due to the reflective white layer.

Sure-Grip® with Slip Protection

Slip protection for lining floors.

Sure-Grip® with Polyester Fabric

The fabric enables an adhesive bond to other materials such as PVC and steel.

Sure-Grip® in Customized Styles

Customized colors and sheet dimensions are available upon request.

Accessories

Installation profiles, corners and welding rods are available to facilitate the installation of the Sure-Grip® concrete protection liners.



Double-Sealing System

The combination of Sure-Grip® concrete protective liners and distance sheets provide the additional security required for storing environmentally hazardous media.

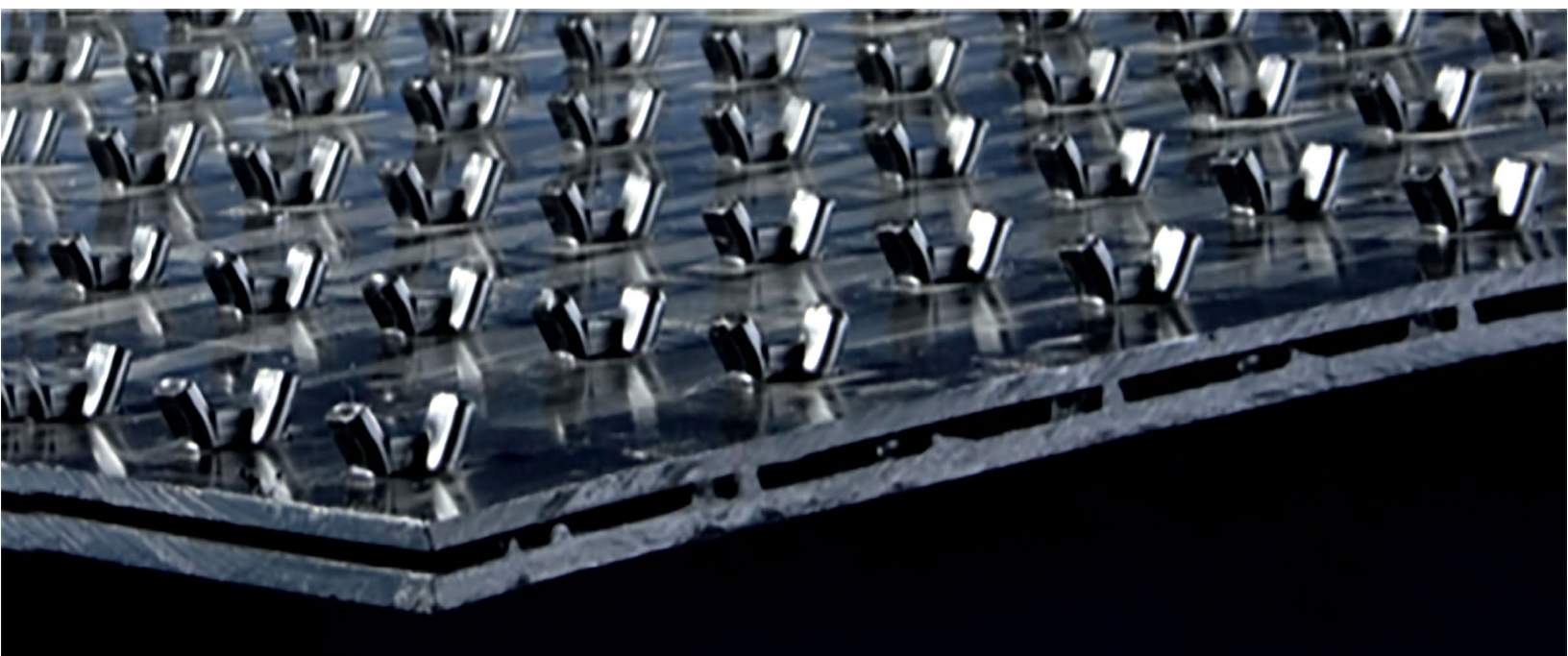
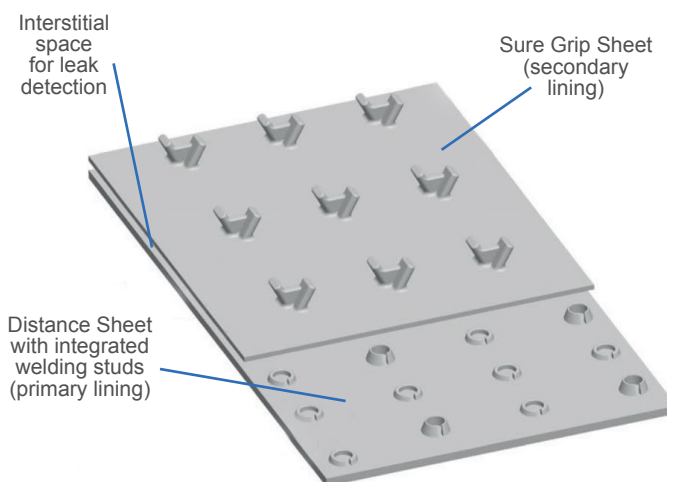
These two individual lining systems are joined by an innovative technology (ultrasonic welding). The space between the sheets enables permanent leak detection and monitoring of the system.

Advantages

- Highest safety (combination of two independent systems)
- Space for monitoring (leak detection)
- High mechanical resistance
- Suitable for outdoor applications (UV stabilized)

Applications

- Storage tanks for groundwater dangerous media
- Reservoirs and drains in the chemical industry
- Disposal systems in the semiconductor industry
- Collection and wastewater basins





HYDRO+ Concrete Protective Liner

PE is becoming more and more popular in the water industry (supply lines for potable water). Meanwhile Sure-Grip® concrete protective liners are very well-established for protection of concrete structures from corrosion. These reasons led to the development of the HYDRO+ lining system for potable water tanks.

HYDRO+ concrete protective liners are primarily used for new construction, both cast in situ and precast elements. It is a perfect solution for higher temperature changes or in areas of high groundwater, where backpressure can buildup.

Supply Range

Material	Type	Thickness	
		From (mm)	To (mm)
PE Blue	HYDRO+	5.0	5.0





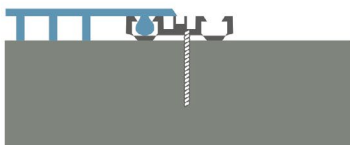
HYDROCLICK®

The HYDROCLICK® system was specifically developed for the rehabilitation of potable water tanks. The HYDROCLICK® design enables a fast and safe installation for both new construction and renovations.

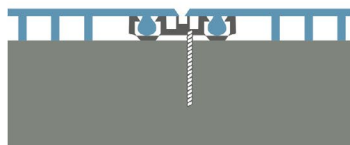
It is particularly advantageous for the rehabilitation of existing tanks. Neither removal of the old lining nor surface preparation are necessary. Therefore the HYDROCLICK® system is cost effective and timesaving. HYDROCLICK® is NSF 61 approved.

Supply Range

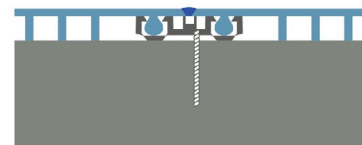
Material	Type	Thickness	
		From (mm)	To (mm)
PE Blue	HYDROCLICK®	4.0	4.0
PE Blue	Extruded Sheets	5.0	20.0



Step 1: CLICK!



Step 2: CLICK!



Step 3: Extrusion Welding

For more information on Agru Concrete Protection
Systems and other Agru products, please reach out to us.



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